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The Metabolic Diet

The Revolutionary Diet That Explodes The Myths About Carbohydrates And Fats

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Preface

My involvement in sports grew hand in hand with my interest in weight control. In my late teens and early twenties I was a member of both the gymnastic and wrestling teams at the University of Toronto. In conjunction with both these sports, I weight trained to increase my muscle mass and strength.

After my internship I started a medical practice in the country and because of lack of opportunity and facilities I had difficulty pursuing either sport. I then turned to powerlifting and over a fifteen year span became one of the top powerlifters in the world.

All three sports had something in common. They all required a certain body efficiency, a maximum of muscle mass and strength and a minimum of body fat, in order to maximize performance.

Thus my interest on how to control body weight and body fat, and maximize muscle mass and strength was a natural result of my sporting career. Over the years I've worked on finding and perfecting the ideal diet for building lean body mass and strength; a diet that could be used as part of an overall plan for maximizing strength and lean body mass and minimizing body fat. A diet that, while it could be used by drug-using athletes, was meant to offer athletes a viable alternative to drug use.

In the early seventies I came up with a diet that was low in carbs and high in fat and protein but that also allowed a substantial amount of carbs over a short period. The low- and high-carb periods were cycled over one-week periods. Over my competitive years I used and refined the diet so that I could maximize my lean body mass and strength and minimize body fat. Over the years I occasionally mentioned the diet in my writing and in 1992 I wrote about the diet in detail in my newsletter *Drugs in Sports*.

In 1994 I wrote *The Anabolic Diet*, a phase shift diet for bodybuilders that was meant to maximize muscle and minimize body fat. *The Anabolic Diet* was the first diet book for bodybuilders that went against the low-fat, high complex-carb diet popular with all bodybuilders at that time. Today, my Anabolic Diet and subsequent variations are widely used by both competitive and aesthetic bodybuilders.

I have spent over thirty years amassing information, searching the scientific and medical literature, observing and experimenting on others and myself. I realized at the time I was writing *The Anabolic Diet* that while the book was geared to bodybuilders, the principles behind the diet could apply to anyone interested in increasing lean body mass and losing body fat and, in fact, to anyone who just wanted to look good.

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I had planned on writing a companion book to *The Anabolic Diet* for everyone else, but time just seemed to slip away. Last year, I realized that I had to get this information out there because the diet worked and also because there was such a rift between the low-carb and high-carb dieters. This is a rift that I feel should not be there since both kinds of diets do have some common ground that brings them together. That common ground will be explained and explored in this book, *The Metabolic Diet*.

Where necessary I have included references from peer-reviewed journals and other literature. Unfortunately, not enough valid studies have been done on various aspects of the information presented in this book, and some of the information presented is a result of my own observations and experimentation.

A word of warning; It cannot be emphasized enough that my theories, although supported directly and indirectly by a substantial body of scientific research and agrees with my own observations and experimentation, are by no means written in stone. There are many people that will not agree with my observations and conclusions, and as such will not agree with my methods.

For example, two criticisms of low-carbohydrate diets are: firstly, that you really can't have significant fat metabolism without carbohydrate metabolism. And secondly, that high-intensity activity cannot be sustained without large amounts of carbohydrate as fuel.

Both premises are flawed and unsubstantiated by the current literature, at least in regards to a diet relatively low in carbohydrates and higher in fat. The statements are based on studies and knowledge obtained by testing subjects and animals that are orientated towards a high complex-carbohydrate diet and not on those who have successfully adapted to a higher-fat, lower-carbohydrate diet. In fact, recent studies have shown that a higher-fat, high-protein, lower-carbohydrate diet may enhance endurance and have little effect on high-volume and/or high-intensity exercise.

On the other hand, there is sufficient research to show that a certain amount of carbohydrates in the diet are necessary if just to allow a reasonable level of glycogen in the liver and muscles. In fat adapted people on a low-carbohydrate diet, the lower levels of glycogen last for a much longer period of time since fat satisfies much of the energy requirements of all but the most intensive exercise. Just how much carbohydrates are needed to achieve satisfactory glycogen levels will vary from individual to individual and at this time can only be reasonably arrived at by trial and error.

Additional research needs to be done to further validate my theories and reasoning behind the Metabolic Diet. Mostly, this research must be directed to subjects that have to one degree or another made the metabolic shift from carbohydrate burning to fat burning as a primary source of fuel. The results of studies that evaluate the effect of

a moderate- to high-fat diet on subjects that are in the "carb mode" may not be valid. As well, the whole issue of the role of fat in certain diseases, including coronary artery disease and cancer, is confusing and somewhat contradictory. Before assuming that fats are bad for you, it must be recognized that there are both good fats and bad fats and that fats don't act alone. As well, cutting back on certain fats can be harmful to your health.

The purpose of this book, therefore, besides presenting various aspects of the Metabolic Diet on how to best lose weight and keep it off, and how to maintain or build lean body mass, is to educate and explain how carbohydrates and fats fit in to our modern diet and ideas and how they affect your health and contribute to various diseases.

Dr. Mauro Di Pasquale
Austin, TX
April 2000

About The Author

Dr. Mauro Di Pasquale is one of the most influential voices on diet, performance nutrition and athletic training in the world. His innovative work in finding safe nutritional alternatives to anabolic steroids and other performance-enhancing drugs has won him praise from athletes, trainers and fitness experts around the globe.

Dr. Di Pasquale was a world-class athlete for over 15 years, winning the World Championships in Powerlifting in 1976 and World Games in 1981. Today he balances a busy career as a licensed physician in Ontario, Canada, with his demanding schedule as a consultant and researcher.

Over the years he has worn many hats. He was an assistant professor at the University of Toronto for over a decade up until 1998. In the early to mid 1990s he served as Drug Program Advisor for the World Wrestling Federation (WWF) and World Bodybuilding Federation, and Medical Review Officer for the National Association for Stock Car Auto Racing (NASCAR). In 1997 to 1999 he was involved in research and product development for Experimental and Applied Sciences (EAS) and was a member of the EAS Scientific Advisory Panel. He is certified in North America as a Medical Review Officer and Master of Fitness Sciences. At present he is President of MetabolicDiet.com a premier sports, nutrition and exercise Internet site.

During his long career he has written several books and hundreds of articles on nutrition, sports medicine and drug use for a variety of international magazines and journals. With these books and articles and as editor-in-chief of the quarterly newsletter *Drugs In Sports* and the bimonthly *Anabolic Research Review*, he brought his expertise to the international community for more than two decades.

In 1995, Dr. Di Pasquale released two new books. The first, *The Anabolic Diet*, presented a diet program that was hailed as the first effective, no-nonsense alternative to anabolic steroids. Since it was first released, *The Anabolic Diet* has become one of the most popular bodybuilding diet books ever and has achieved almost a cult status. The second book, *The Bodybuilding Supplement Review,* provided a reliable, in-depth look at the many nutritional supplements on the market, and brought a much-needed breath of fresh air to an industry long noted for wild claims and ineffective products.

In 1997, CRC Press published Dr. Di Pasquale's authoritative book *Amino Acids and Proteins for the Athlete - The Anabolic Edge*. This book has been claimed as the one of the best books ever published on the topic of amino acids, proteins and nutritional supplements.

The Metabolic Diet

In 1999, Dr. Di Pasquale co-founded, and is President of MetabolicDiet.com (www.MetabolicDiet.com), an Internet based company that is geared to help anyone maximize their training and dieting experience. This site provides information and expertise on increasing sports and exercise performance, increasing lean body mass, losing body fat, nutrition, nutritional supplements, strength training, injury prevention and treatment, and much more.

Now, in *The Metabolic Diet*, he brings more than 30 years of experience in nutrition, training and hormonal research to you. *The Metabolic Diet* is a revolutionary plan for using healthy dietary fat and the foods you love, to manipulate the body's natural hormones to not only burn off fat but shape and tone your body. It attacks the carbohydrate mania fueled by the media and food industry and gives you a simple, practical, and tasty approach to taking off the weight, keeping it off and creating the kind of firm, healthy body you want.

Unlike most other diets on the market today, the Metabolic Diet is based on scientific principles and medical research. It provides not only a guide to the basic diet but detailed advice on how to incorporate exercise and supplements into your diet to guarantee success. If you've become disillusioned with the trendy, designer diets that don't work and the torture of those plans where you're forced to abandon your favorite foods forever, the Metabolic Diet is for you.

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Acknowledgments

Many people, including researchers, clinicians, athletes and patients, have helped me to transform my ideas and thoughts into this book. However, although I have had considerable help from many individuals in forming my theories and writing this book, I take sole responsibility for its contents and final format.

Introduction

Fat Are Us?

As a nation we're getting fatter. We're fatter than our parents, who were fatter than their parents. Not surprisingly, over 55 percent of all adults in the United States over the age of 20 years old are overweight (at least 20 percent above ideal weight). And there doesn't seem to be anything we can do about it. We now have access to more information about managing our weight and decreasing body fat than we ever did. We know more about how to lose weight and look good and what's good and bad to eat. Yet the fat parade marches on. The more obsessed we are with being lean, the fatter we get.

In recent years, obesity has emerged as a major public health issue because it is strongly linked to serious diseases such as diabetes, hypertension, digestive disorders, a variety of cardiovascular ailments and certain forms of cancer. Not only is there an increased risk of disease and death, over 300,000 deaths each year, but also, obesity carries a high economic cost estimated at more than $70 billion annually in the United States.

All that medical and economic stuff is important but it's not the main reason why we're so obsessed with weight loss and thinness. The main reason we want to lose weight and body fat is that we want to look and feel better. Sure, being overweight is associated with several chronic conditions and costs us plenty in health care costs, but most overweight people just want to look and feel better and fit in with our cultural norms and aspirations. Being overweight in this society has severe emotional and psychological as well as medical repercussions.

So everyone wants to be trim and hard. No one wants to have a beer belly, love handles, thunder thighs, extra chins or sagging anything. Women want to be slim, toned and sexy. Men want to be manly, so they want to look hard and muscular. But it isn't easy. Most of us desperately want a trim healthy body, but few are able to actually attain it. With that in mind, is it any wonder that we're all looking for the magical cure? And since we're all looking there's plenty of people out there with the answers, for a price, of course.

I wrote *The Metabolic Diet* in answer to all those who try and sell you the easy way to lose weight. First of all, let me tell you that there is no easy way to lose weight and body fat. It requires a lot of changes and some pain no matter how you do it. On the other hand, there are easier ways to lose weight and body fat. And, guess what? One of the easiest and most effective ways is by following the Metabolic Diet.

What Is The Metabolic Diet?

The Metabolic Diet can be the answer to everyone's dieting quest: The Holy Grail of Diets. Unlike all other diets, the Metabolic Diet is like a living entity in that it adjusts itself to each individual's macronutrient needs. By using the Metabolic Diet you can dial in your metabolism to the kind of diet that's best for you.

The Metabolic Diet encompasses all the various diets that are carbohydrate conscious including, among others, those that are champions of low dietary carbohydrate intake to one degree or another. These include my own Anabolic Diet, Atkins' Diet Revolution, Protein Power, the pediatric Ketogenic Diet, and Barry Sears' Zone Diet; and those that follow the more conventional high complex-carbohydrate, lower-fat approach.

What all these diets have in common is that the level of dietary carbs, whether low or high, is one of the most important factors in the success of the diet. Dietary fat is also important in most of these diets with dietary protein often relegated to the back seat.

The diets that restrict carbohydrate intake to less than the currently accepted 55 to 70 percent of dietary calories are often criticized by the conservative majority, including dieticians and other health professionals. This conservative group feels that high fat intake is responsible for our overweight society and that the only cure is the universal implementation of high complex-carb, low-fat diets.

On the other hand, the high complex-carb diets are criticized by the vocal minority who feel that high dietary carb intakes and subsequent insulin response, not dietary fats, are responsible for our overweight society and many of our present ills. As usual the real answer lies in examining what each side has to say and coming up with the reality of the carbs vs. fats controversy.

I've written *The Metabolic Diet* in order to address the issues that both groups have brought to the table and come to a consensus that both groups can live with. After all, the two groups have much in common about dieting especially in the importance of calories and the necessary lifestyle changes, such as exercise, that must accompany any diet if it is to be successful in both the short and the long term.

As such, *The Metabolic Diet* can be viewed as a one-stop solution to the age-old dieting dilemma. The principles behind this book are based on research and science. You won't see the nonsense here that you find in most of the diet books out there. I'm not going to make you take leaps of faith so that you become a believer. What this book will do is give you enough solid information so that you can reasonably assess the low and high-carb arguments and come to your own conclusion on what kind of diet is right for you. Whether it's a low-carb variant or a traditional high complex-carb, low-fat diet.

Introduction

Low-Carb Dieting

In the low-carb group of diet gurus there are proponents of every level of dietary carbohydrate intake from the almost-zero amounts espoused by the Ketogenic Diet used to treat some forms of epilepsy in children to the Zone Diet that proposes that only 40% of the daily calorie intake come from carbohydrates.

First of all, let me state that for weight loss purposes all diets work. All it takes is a drop in calories to a level below your calorie needs. The proponents of the lower-carb diets feel that the type of weight lost is as important as the amount of weight lost. As such, they feel that conventional high complex-carb, low-fat diets result in the loss of lean body mass, especially all-important muscle, and less fat than the same amount of weight lost with a carbohydrate reduced diet.

As well, it's important to realize that the low-carb diets run counter to the general dietary rules that are accepted by physicians, dieticians and other health professionals. The low-carb diet is seen as an unhealthy fad diet. And in some ways it is. Especially in its ketogenic mode where an excess of ketones build up in the body and are excreted and detected in the urine. Detractors to the ketogenic diets maintain that ketosis is dangerous and can lead to life threatening ketoacidosis. Proponents of the diet, on the other hand, maintain that the dangerous ketoacidosis as seen in diabetics is unlikely to result from dietary manipulation. There are various reasons put forward and some validity for both claims.

Dietary ketosis, whether or not it can lead to the dangerous ketoacidosis, is not a desirable state to stay in. That's because it has been shown to be a starvation state, and unless there is adequate protein intake it leads to excessive muscle breakdown (catabolism) if it's allowed to continue unabated for any length of time. As such, at least in the case of continuous ketosis, the results on muscle mass and energy can be counter productive for anyone who exercises as the chronic ketosis is conducive to losses in muscle mass, strength and exercise performance.

Another criticism of the low-carb diets is that it decreases muscle and liver carbohydrate stores, in the form of glycogen, and as such decreases one's ability to do useful high-intensity and endurance exercise.

Studies have shown that athletic performance, both high-intensity and endurance, is dependant on muscle and liver glycogen stores. As such, the general consensus is that a lower-carb diet will decrease glycogen stores and will impair performance. On the other hand, many recent studies have shown that acclimatization to a lower-carb diet results in endurance performance on par or even greater than those on higher-carb diets and higher initial body glycogen stores.

That's because, in those that are fat-adapted, the body tends to preserve its glycogen stores and use fatty acids as a primary source of energy. The end result is even though there is less glycogen in the muscles and liver, it lasts longer and performance rather than suffering may actually improve.

And it's the same in our everyday lives. If we decrease dietary carbs then the body will utilize both dietary and body fat for energy, sparing the initially lower levels of glycogen and also sparing the use of amino acids, obtained to some extent by cannibalizing skeletal muscle.

On the other hand, if we decrease carbs too much (and the amount depends on the individual, as we'll see later), then both liver and muscle glycogen will be at a constantly depleted state with not enough glycogen to support any type of optimal exercise. Also, the state of ketosis that is present under these circumstances presents its own set of problems as mentioned above.

The solution to this carb dilemma is what the Metabolic Diet is all about. The solution, as I see it, if to find that almost magical dietary carb level where our metabolism is peaked for full physical and mental efficiency but we're still utilizing fat as a primary fuel. In this book we'll be exploring just how to determine that set point for each reader and how to manipulate the diet to get us there so that our efficiency, and fat burning, muscle retaining potential is maximized.

The purpose of this book is to help people to titrate (add just enough carbs for the effects we want) themselves so that their intake of dietary carbohydrates is no more and no less than they need to function optimally but still to enjoy the glycogen and protein sparing effects that an increased ability to oxidize fats will bring. In this way you can lose the fat and weight you want without unduly sacrificing your muscles.

Finding this metabolic set point involves an initial attempt to shift your metabolism from a carb orientated one to one more conducive to burning fat. There are basically two ways that we could try and find this metabolic set point. We could start with an arbitrary dietary carb level that is higher than recommended and gradually work our way down until we arrive at that point. Or we could start in the other direction and take in almost no carbs and then work our way up.

From my experience, the best way is to start with an extremely low-carb dietary intake and work up. Working down doesn't seem to work as fast or be as effective in finding the set point.

Introduction

Our Genetic Differences

It's reasonable to expect that the relative ability to oxidize fats as a primary fuel source varies in our population and is both genetically determined and environmentally expressed (as are most of our abilities and traits). Several studies in the past ten years support the concept of a gene-diet interaction even though most of this work has involved the connection between the response of serum cholesterol to both dietary fat and carbohydrates. Furthermore, even the genetic hereditability of dietary responsiveness has not been carefully studied in humans.

Nevertheless, in light of the likely genetic differences in the ability to oxidize fat efficiently, I think it's safe to assume that some people are very efficient fat oxidizers (able to easily use fatty acids as a primary fuel) while others are not and that most of us lie somewhere in between.

The efficient fat oxidizers seem to do very well at the low end of the dietary carb scale while those that are not seem to do well at the upper dietary carb levels. The trick is to find out just where your carbohydrate set point lies, especially if you're trying to make some changes to your body composition by losing weight and/or body fat, and maintaining or gaining muscle as you do so.

Moving On

In order to find out just where you fit in the carbohydrate continuum as far as being able to function well, you first have to see how well you do on an extremely low dietary carbohydrate diet.

As such, the first, or Assessment Phase, of the Metabolic Diet consists of cycling a ketogenic diet similar to that found in my Anabolic Diet. That is, the weekdays are very strict and low in dietary carbs while the weekends are relatively high in carbs. So while the weekdays are difficult (at least at first) and strict, the weekends are what I call socially acceptable dieting where almost anything goes including pizza and beer.

Once we've determined just how well you do on the low-carb diet we then move on to the Set Point Phase where we determine just how many carbs you need and when you need to take these carbs.

By the way, you'll notice that there is little emphasis on ketosis (ketones in the blood) and ketonuria (ketones in the urine - measured by ketone sticks that turn different shades of purple - the darker the purple the more ketones in the urine.). That's because I'm more interested on your physical and mental response to dietary carbs at different levels of intake. Measuring ketones in the urine doesn't tell us enough to warrant using them. Also, the measure of your success on this diet isn't reflected by the measurements of ketones in your urine; it's measured by real world results.

Chapter 1

Dietary Fat Is Not The Enemy!

The Myths

If you live in the Western World, you've had the "fat-is-bad" mantra drummed into you for the last 30 years. Most everybody is involved in what appears to be a conspiracy but, in fact, is just a consensus reached by many years of concentrating on the beneficial effects of carbohydrates and the harmful effects of fat in our diets. We've been looking at these effects with blinders on and with a determination and stubbornness that would have made some of our less tolerant ancestors proud. Especially those who were in the majority when they categorically stated that the earth was flat and the center of the universe.

Almost everyone seems to feel that the best diet for all of us is the high complex-carbohydrate, low-protein, and low-fat diet. This includes the American Medical Association, the American Dietetic Association, the media trendsetters, the fitness gurus, and the next-door neighbor or friend on a perennial diet who reads the health and fitness magazines like they were the Bible.

They all agree: Fat is bad and carbohydrates are good. If you want to feel good about the way you look and create that body you've been dreaming of, you've got to concentrate on those carbohydrates and keep that evil dietary fat to an absolute minimum.

By now, those percentages etched in granite by the so-called Experts Of High-Carb and Low-fat have become as familiar as your social security number. At least 55 percent of your calories, and preferably more, should come from those beloved carbs. No more than 15 percent of your diet should be fat. Even some bodybuilders, who still follow this kind of diet but believe they need higher levels of protein in their diets, load up such low fat delights as skinless turkey and chicken, and the perennial favorite, tuna in water.

When you go out to eat, salads with the restaurant's delicious "low-fat" dressing end up on your plate. On the occasions when you do decide to tempt fate and eat a piece of meat, you cut off all visible fat with the precision of a surgeon and you always broil. Never fry. Why, the mere mention of the word "fat" can be enough to send you running for the bathroom scale.

Now, take a deep breath. I'm going to tell you something that will surprise and even shock you. Ready? Here it comes: **Fat is good**. In fact, if you want to lose weight the best way for most people to do it is with a properly planned and conscientiously applied diet that is relatively high in fat (i.e. above those hallowed 10-15 % levels).

Although it sounds a bit crazy, it's not. I've used the principles of a higher-fat diet to help athletes and other people to lose weight and body fat for over 30 years now and I know that it's true. My Metabolic Diet is more effective for giving you that trim athletic body you've always wanted than any other diet plan out there. That's because my diet can run the gamut and can accommodate everyone, regardless of their metabolic capabilities, to use fat or carbohydrates for the energy they need.

The fact is that for many people the high-carbohydrate diet can actually work against them. Even if they lose weight, they end up losing muscle tone. The fat may fall away, but so does the shape and firmness of their body. In the end, they can end up looking worse than they did when they were overweight.

And that's if they're able to maintain the diet for a long enough period to lose the weight. As the usual carbohydrate-based diet drags on, personal motivation fails. If you're not specifically suited to this kind of diet you can become irritable; maybe even depressed. Energy levels drop. It's very difficult to stay on a diet when you're feeling this awful.

And what about the agonizing diet disciplines they put you on. To say they're inconvenient and strict would be a drastic understatement. They're the living embodiment of that painful advice once offered by fitness guru Jack LaLanne: "If it's man-made, avoid it. If it tastes good, spit it out." What a way to live!

All those foods that you love to eat are either gone forever or relegated to a brief but guilty encounter on Thanksgiving Day or Christmas. In a world where eating makes up a great part of our social life, the regimen of a high-carb, low-fat diet can quickly make you a social outcast.

Not that most of you can't make progress with a high-carb diet; you can. Some much more than others. You can also find yourself plateauing and never getting below a certain, still undesirable weight. As the weeks go by, panic can set in. You may do something drastic and end up sacrificing weeks of dieting and endangering the progress you've already made. Even if you do lose the weight you want, you may find yourself with a body that looks like an aging neckline in a bikini or swimsuit.

So, why are you torturing yourself? Especially when there is an alternative that will have you losing inches of fat while shaping a body that looks great. I call it the Metabolic Diet and, despite what you may have been led to believe, it could be the answer to your prayers.

After having said all of this I also have to admit that things have changed since I first wrote *The Anabolic Diet* back in 1994. In the last five years lower-carb dieting has become more popular although hardly mainstream. As well, the general population is being exposed to information about the fallacy of low-fat diets and the value of fats in our diets.

A recent article released by CBS on June 16, 1999, shows this trend. The article states: "Fat intake is now at an all-time low, and obesity is at an all-time high. By overindulging in low-fat yet high-calorie foods, many people have gone overboard, experts say." It goes on to say that eating foods high in fat will help you maintain good health. It also states:

> "'Other vitamins found in some fatty foods -- vitamins A, D, E, and K -- are important for a healthy diet,' says Lester Crawford, a professor of nutrition at Georgetown University in Washington, D.C. 'These [vitamins] are essential to life -- without fat in a diet, they are not absorbed properly,' Crawford says."

The article states "it's possible to prevent the onset of certain diseases if you include fatty foods in your diet. Monounsaturated fats help reduce the risk of heart disease and lab studies show that conjugated linoleic acid, a type of fat found naturally in dairy products and red meat, may help prevent colon cancer."

The article also points out that "the saturated fat found in chocolate and meat contains stearic acid which, unlike other fatty acids, does not raise blood cholesterol levels. The advice of health authorities to consume less fat has led to a fat phobia in America. It's time we eat these foods every so often, not just for enjoyment, but because it's good for us." Amen to that.

The Red Meat Fallacy

The dangers of red meat have been grossly exaggerated. Although epidemiological studies have shown that people who consume more red meat are more prone to higher cholesterol levels and to coronary artery disease, it's not the same thing as saying that red meat is bad for you. That's not something you can extrapolate from the available data because epidemiological studies do not show cause and effect, only correlations and probabilities.

In fact, in a recent study red meat was shown to have beneficial effects on serum cholesterol and triglycerides, the other important fat.[3] In this study published in the *Archives of Internal Medicine*, researchers from Johns Hopkins University, the Chicago Center for Clinical Research, and the University of Minnesota Hospital and Clinics looked at the effects of lean red meat and white meat on 191 patients with high cholesterol. The patients were all put on comprehensive low-fat, low-cholesterol diets, and were randomly assigned to get 80 percent of their meat from either lean red meats (beef, veal or pork) or lean white meats (fish or chicken). The patients followed their diets for nine months.

At the end of the study, the researchers found that the red meat and white meat groups had nearly identical changes in their cholesterol levels -- an average decrease of 1 to 3 percent in "bad' low-density lipoprotein (LDL) cholesterol and an average 2 percent increase in "good" high-density lipoprotein (HDL) cholesterol. Members of both groups had an average drop of 6 percent in their levels of triglycerides, molecules needed to produce fats.

Meat also contains conjugated linoleic acid (CLA), a powerful anti-carcinogen and fat burner. As well, meat contains all of the B-vitamins, vitamin A, vitamin D, zinc, iron, phosphorous, potassium, magnesium, and lots of high quality protein. It's a mistake to completely exclude such a complete food from your diet.

Now that we've exorcised the "fat-and-red-meat-are-bad" mantras, lets have a look at another: the one that says high-protein diets are bad for you. There's been a lot of talk that high-protein diets are bad for your heart and kidneys. That's not true. On the contrary, switching protein for carbs in your diet is actually good for your heart.

For example, a recently published study contradicts the theory that high-protein diets may promote heart disease. The results of a 14-year study of more than 80,000 women showed that a menu rich in animal and vegetable proteins might actually cut heart-disease risk. Researchers at Harvard Medical School discovered that women with the highest protein intakes were 26 percent less likely than those who ate the least protein to develop ischemic heart disease (IHD).

IHD occurs when an insufficient supply of blood and oxygen reaches the heart, often due to the buildup of fatty deposits in heart arteries. Meat and dairy products, as well as certain vegetable oils such as coconut and palm oils, are the main sources of dietary saturated fats. Because saturated fats raise blood levels of LDL, it has been thought that diets rich in animal products may promote ischemic heart disease.

The Harvard study strongly rejects that idea. As well, previous research has shown that carbohydrate-rich diets reduce HDL, the "good" cholesterol believed to help protect the heart from disease. Replacing some of these carbohydrates with protein helps boost HDL levels.

As far as high-protein diets and your kidneys, there is no documented information that high-protein diets cause any kidney problems in normal, healthy people. On the other hand, high-protein diets can be harmful for those with any appreciable degree of kidney impairment.

Chapter 1 You Can Become A Fat Burning Machine

You Can Become A Fat Burning Machine

Unlike a high-carb diet that can leave your body sagging and lacking muscle tone, the Metabolic Diet maximizes the production and use of the body's Big 3 Hormones (testosterone, growth hormone and insulin) for firming your body and does it naturally. It also shifts the body's metabolism from that of a sugar-burning, fat-producing machine to that of a fat-burning machine. With the body adding muscle tone and simultaneously burning both dietary and stored body fat, a person using the Metabolic Diet can find themselves twice blessed.

The Metabolic Diet stresses a higher-fat/high-protein/low-carbohydrate approach to nutrition but also offers variations in this diet to accommodate those people who don't use fat as efficiently and need more carbs in their diets. Many in the general public will dismiss it out of hand, citing the popular beliefs that fat is a prime component in heart disease, cancer and obesity. Likewise, many in the fitness community have come to assume that dietary fat breeds body fat.

They couldn't be more wrong. Dietary fat only breeds body fat in higher-calorie diets that are also high in carbohydrates. That's because it's the level of carbs in the diet that dictates whether or not fat is used up or stored.

Dietary fat, when used properly as we do in the Metabolic Diet, can be the key to weight loss and shaping a body you can be proud of. And, while some will see the diet as a new, revolutionary and perhaps even dangerous approach to nutrition, its basics actually originated with the dawn of mankind.

The Primitive Diet

First let's clear up a widely held misconception that ancient man was a herbivore who turned his nose up at all meat in favor of the available plant life. Current vegetarians often claim that their diet is the most natural and ancient known to humankind in the hopes of gaining new converts, but this is simply not true. Fred Flintstone ate meat and plenty of it.

In fact, archaeological evidence shows that our earliest tools were put to use, at least in part, in the dressing of meat.[4] In many areas, the diet of Fred and Wilma was made up almost entirely of animal products. The continued affection for meat demonstrated by the monkeys and apes, that are our primate cousins today, is also testament to our early dietary preference.

There's a good reason for all this ingestion of meat. It's called survival. Meat is a far superior source of important amino acids than plants and is required by the body. It's also high in vitamins A, E and B complex. Vitamin B12, while plentiful in meat, is not found in vegetable products. Red meat is loaded with iron that is easily absorbed, unlike the iron that is present in many plant sources.

As well, red meats are excellent sources of potassium, zinc and magnesium. Fat, a substance whose benefits we'll outline throughout this book, is also readily available in meat and less so in most plants.

Indeed, meat is one of the most nutritious substances on earth and it's been held in high esteem by civilizations throughout history. It's even played a big role in religious ceremony. In the early days of recorded history, meat was offered to the prevailing Gods through "burnt offerings" and the Bible describes feasts held in conjunction with these animal sacrifices.

So when we're talking about "natural" or "primitive" diets, we're not talking about the eating habits of vegetarians. We're talking about combination plant and meat eaters who came to understand the importance of meat in the daily diet. Man's earliest diet probably consisted primarily of meat, and whatever berries and other edible plant parts they could scrounge. I doubt that there were any substantial feedings of carbohydrates. It was only with the development of agriculture a mere 10,000 years ago that any large change was seen. In the nearly 50 million years of existence before that, humans were likely carnivorous and relied on animal flesh for survival to one degree or another.

At its crudest, a meat diet bears a strong resemblance to the strict or Assessment Part of the Metabolic Diet. All we've done in this phase of the Metabolic Diet is to take the primitive diet, consisting of animal and mostly fibrous plant foods, and brought it into the modern age, making use of modern science to adapt it and perfect it for maximum health, fitness and body aesthetics.

In response to this, some people will argue that the domesticated meats available today are fatter than the wild meats consumed by our ancestors and also fatter than the meat from wild animals today. While this is true, it's only a matter of degree. In the Metabolic Diet the quantity of fats is as important as the quality since we use the increased fat intake to shift our metabolism. We thus make constructive use of the increased amount of polyunsaturated, monounsaturated and saturated fats without incurring any of the potential bad effects.

The point I want to make here is that meat is not inherently bad. Our ancestors ate meat to some degree for many thousands of years and we're genetically built to make maximum use of all it has to offer. On the other hand, we also have the capabilities to manage and use various kinds of plant food. After all, our evolutionary process has taken us through many dietary phases where both meat and plant foods were in our diet in various proportions in a continuum between the two extremes: the all-meat diets and the all-plant diets.

Chapter 1 Modern "Higher-Fat" Diets

If we look at the overall picture and take into account the various phases of man's evolution, the one lesson to take home when we discuss our ancestors' eating patterns is that because of varied eating patterns, man has had to undergo a diverse evolutionary process. As a result of this process we have the genetic ability to use fats, including stored body fat, as our main energy source, an ability that is not utilized fully by those of us on today's high-carbohydrate diets.

Modern "Higher-Fat" Diets

"Politically-correct" nutrition is based on the assumption that we should reduce our intake of fats, particularly saturated fats from animal sources. Fats from animal sources containing both cholesterol and saturated fats are presented as the villains of the civilized diet.

Anyone choosing to examine the truth behind the Great Fat Scare of the late 20th century wouldn't have to do much research to find some very disturbing exceptions to the "Fat is Bad" mantra.

Why We Need Dietary Fat:

- Fats from animal and vegetable sources provide a concentrated source of energy in the diet.
- Fats provide the building blocks for cell membranes, hormones, and prostaglandins, substances that mediate important chemical processes in the body.
- Fats are necessary for the proper absorption, breakdown and use of vitamins A, D, E and K by the body.
- Fats are needed for conversion of carotene to vitamin A and for a host of other processes.
- Fats are very tasty, which adds to the overall pleasure of eating.

The theory that there is a direct relationship between the amount of saturated fat in the diet and the incidence of coronary heart disease, as well as certain types of diseases such as cancer, was proposed over four decades ago. Little change in the dogma has occurred even though numerous subsequent studies have questioned the original data and conclusions.

The experts assure us that the theory of animal fat consumption causing coronary heart disease is backed by abundant evidence. Most people would be surprised to learn that there is, in fact, very little hard evidence to support the contention that a diet low in cholesterol and saturated fat actually reduces death from heart disease or in any way increases one's life span. Consider the following:

If, as we have been told, heart disease results from consumption of saturated fats, one would expect to find a corresponding increase in animal fat in the American diet. Actually the reverse is true. Not only has the incidence of heart disease dramatically increased in the sixty-year period from 1910 to 1970, the proportion of traditional animal fat in the American diet declined from 83% to 62%, and butter consumption plummeted from 18 pounds per person per year to four pounds. During the past eighty years, dietary cholesterol intake has increased only 1%. During the same period the percentage of dietary vegetable fat in the form of margarine, shortening, and refined oils increased about 400%, and the consumption of sugar and processed foods increased about 60%.

A look at the Eskimo tribes inhabiting the Northern latitudes from Greenland across Canada to Asia shows several strong examples of hardy people flourishing on high-fat diets.[5] Despite their dependence on dietary fat, they experience little of the arterial and heart disease that dietary fat is supposed to create.

For instance, the Greenlandic Eskimos have lived off a high-fat diet consisting primarily of butter, cheese, meat and fish for most of their history. In fact, fatty foods were highly valued. Rent on land in some areas was paid off in butter. But none keeled over on his or her way to pay the landlord. Heart disease was almost unknown until Western civilization brought dietary changes to their society in recent decades.

Much the same situation is found in Canada and Alaska. In fact, the high-fat diet and relative good health of the North American Eskimos has been the source of much valuable research examining the health benefits of fish oil that we'll talk about later in this book.

And it's not only the Eskimos who have benefited from dietary fat. The Low fat Experts must be really confused by the African Masai. The adult males of these pastoral and hunting people from Kenya and Tanganyika live on a diet made up almost exclusively of meat, milk and blood. Despite their diets, the Masai have a healthy cholesterol profile and a low incidence of coronary artery disease (CAD).

Then there's that troubling "French Paradox" that's been receiving so much attention in recent years. The French seem to love nothing as much as dietary fat. They take great pride in their gourmet cooking that features butter, cheese, ham, bacon, sausage and a variety of other foods rich in fat.

Despite all this fat, the French continue to avoid the widespread cardiovascular problems we experience in the United States.[6] The French have a lower rate of coronary heart disease than many other western countries. In the United States, 315 of every 100,000 middle-aged men die of heart attacks each year; in France the rate is 145 per 100,000. In the Gascony region, where goose and duck liver form a staple of the diet, this rate is a remarkably low 80 per 100,000.

All this has shocked the Experts of Low fat, who seem to equate dietary fat with early death, and has led to a number of studies seeking to find why the French weren't keeling over right and left from heart attacks.

Many observers have focused on reports that phenolic compounds (with significant antioxidant properties) in the red wine that the French love may be responsible for the so-called "paradox".[7] I think it's more likely that the French's reduced carbohydrate intake is at least partly responsible. There are far less refined sugars in the French diet while sugar is in virtually every food product on the market this side of the Atlantic. In fact, the refined carbohydrate consumption of Americans is five times that of the French.

A similar situation exists in Spain. Here's a culture where cigarette smoking is the order of the day, meat is a dietary mainstay, caffeine is treated like water and people's daily lifestyle is not exactly Spartan. Yet the Spanish are among the longest living people in Europe. The fact that most Spaniards drink wine with every meal except breakfast and enjoy a diet where fish is plentiful may say a great deal about their longevity. Carbohydrates are also restricted in comparison to the amount consumed by Americans.

Clearly, something is wrong with the theories we read of in the popular press (and used to bolster sales of "low-fat" concoctions and cholesterol-free foods). The notion that saturated fats per se cause heart disease as well as cancer is not only facile, it’s just plain wrong.

It is a very difficult task to trace down all the factors involved in cultural health variations, but it's certain that differences in carbohydrate consumption and the type of fats, such as trans fatty acids, in our diets play a much larger role in these variations than previously suspected. Still, you can be sure that the anti-fat lobby will continue to look for alternatives to the obvious in their ongoing campaign to discredit any and all forms of dietary fat.

The All-American Diet

The American love affair with refined carbohydrates only began at the beginning of the 20th century. Cola drinks were at the forefront of the movement (we were, quite wisely, big water drinkers before then) and the processed white flour and sugar products that now dominate our diet were only introduced early in this century.

Before then sugar had been prohibitively expensive for most people. Not surprisingly, heart disease was virtually unheard of in large sections of our society before this time.

Meanwhile, much has been made of the overall increase in life span during the century. Life expectancy in the early 1900's was only 50 years, but has increased by more than 20 years since then. Many have chalked this up to improvements in diet and lifestyle, but it's frequently forgotten that the incidence of death among children under the age of 16 has dropped dramatically during the century.

A national program of vaccinations for disease and medical advances in pediatric and perinatal care has greatly decreased the death rate of children from birth through adolescence. When you take these figures into account and factor them in with advances in adult medicine, the increase in our average lifespan is not so remarkable.

The fact is we're not as healthy and fit as many of our ancestors were. As a society we're out of shape. The invention of television, an increasingly sedentary lifestyle, advanced technology, the service economy, lack of exercise and other changes in the way we live have combined to produce a society with a real fitness crisis.

There's no doubt that our 20th century, carbohydrate-loaded diets have played a role in our lack of fitness. When you eat one of those high-carb meals full of starches, sugars and fruits your blood sugar levels rise rapidly. At that point, your body has a decision to make: How much of that sugar is going to be used for immediate energy and how much is going to be stored to be used later?

That's where "insulin" comes in. Insulin is a very important hormone because of the role it plays in providing energy for our bodies. It's also very important in weight control and body fat levels.

As blood sugar increases after a meal, insulin is secreted from the pancreas. It will convert some of the glucose (sugar) into a starch called glycogen, which is stored in the muscles and liver for future energy needs. However, if all the storage areas for glycogen are filled and there is more glucose remaining in the blood than the body needs, insulin converts the excess into triglyceride. Triglycerides are the main component of body fat. As a result, when you eat one of these high-carb meals, you're probably going to store a good part of it on those hips or stomach roll.

When insulin is chronically high or yo-yo's up and down, as it does when you're sitting down to those big carb meals, it becomes an extremely lipogenic (fat producing) hormone. It begins to lay down all sorts of fat on the body. Obesity results and there's no doubt that being obese greatly increases your chance of heart disease.

Visceral fat obesity, in which fat accumulation is predominant in the intraabdominal cavity (resulting in the commonly seen beer or pot bellies), is more frequently accompanied by disorders of glucose and lipid metabolism and also with hypertension than subcutaneous fat obesity (the fat that you can see). One study showed that visceral fat obesity was present in almost 90% of obese patients with coronary artery disease.[8]

Chronically high-carbohydrate consumption can also decrease motivation and play havoc with your mood or overall disposition. As we'll see later, this can also have a severe effect on overall exercise and lifestyle habits.

The Metabolic Diet Is Flexible

On the other hand, some people need carbohydrates more than others to function at peak efficiency. The Metabolic Diet is flexible enough to suit anyone, regardless of his or her carbohydrate needs. That's because it's meant to titrate you up to the lowest level of dietary carbohydrates for peak efficiency while not sacrificing any of its anabolic and fat loss effects.

Even in its most basic form, such as in the Assessment Phase, there is a place for higher dietary levels of carbs in the Metabolic Diet. By scheduling and manipulating the role of carbohydrates in the diet, we can time hormone bursts so they have a maximum effect on fat loss and overall body shaping and toning. Then, before insulin can begin to create a body fat problem, we cut the carbohydrates off. It's very simple, but incredibly effective.

By following the Assessment Phase of the diet we teach our bodies how to effectively burn off both dietary and body fat. This lesson isn't forgotten even in those where dietary carbohydrates have to be increased for maximum efficiency. That's because the increase in carbs is titrated carefully, increasing from low levels of carbs during the Assessment Phase of the diet until maximum effects are achieved, and no further.

Heart Disease And Diet

When looking at dietary fat, it's important to remember that fat is actually an essential part of a healthy person's diet. Some people have restricted their fat intake to a mere 5-10 percent of their diet and this can have serious effects on overall health.

The fact is that reducing fat intake to 20 percent or less is foolish. Many people believe that the lower the fat in your diet, the healthier your diet will be. They don't realize that some fat is absolutely essential to your health. Nor do they know the difference between which fats are good and which are bad for your health.

Further, it's seldom understood that a low-fat diet may actually increase your chance for cardiovascular disease because the reduction in dietary fat can adversely affect blood lipids such as triglycerides and HDL, as we'll see later, and the vital intake of essential fatty acids.

Unsaturated omega-3 and omega-6 fatty acids are called essential fatty acids, or EFAs, because, although they are very important, the body cannot manufacture them, at least not in the form in which they occur. A balance of omega-3 and omega-6 fatty acids is necessary to good health. The higher-carbon chain omega-3 fatty acids (as found in fish oils) are the substances that appear to protect Eskimos with high-fat diets from cardiovascular disease. As we'll discuss later in depth, they are a key to protection from heart disease and atherosclerosis (cholesterol buildup in the arteries).

Centuries ago, we obtained plenty of omega-3's from wild plants and fish and game. Today, because foods rich in omega-3's are highly perishable, they are avoided by the commercial food industry. The problem is that the polyunsaturate family, and particularly omega-3, are unstable. With their double carbon bonds, these fatty acids tend to polymerize - that is, bond with each other and bond with other molecules. They are also easily rendered rancid (rancid fat contains chemicals called peroxides and aldehydes that can damage cells and cause cholesterol to clog arteries) when subjected to heat, oxygen, and moisture as in cooking and processing.

Because of this instability, fried foods, margarine, shortenings and vegetable oils rich in hydrogenated fatty acids (and other harmful products of hydrogenation) and the sometimes-destructive omega-6 fatty acids have taken their place and the result has been an explosive increase in cardiovascular disease.

Our diets are high in polyunsaturated fatty acids, something like 10% to 30% of the total caloric intake; most of these polyunsaturates are in the form of omega-6 linoleic acid. However, they contain very little vital omega- 3 linolenic acid. Recent research has revealed that too much omega- 6 in the diet can interfere with the enzymes that produce longer chain highly-saturated fatty acids, which are the precursors of important prostaglandins. These are localized tissue hormones that direct many processes in the cells. When the production of prostaglandins is compromised by excess omega-6 in the diet, coupled with too little omega-3, serious problems may result including inflammation, hypertension, irritation of the digestive tract, depressed immune function, sterility, cell proliferation, cancer, and weight gain.

In contrast, dietary saturated fats contribute to optimal utilization of essential fatty acids. Thus, although not called essential, saturated fats are absolutely necessary in the diet, not only for the roles they play in enhancing EFA utilization, in supplying quick energy, and in their immune system enhancing characteristics, but also because of the important vitamins they carry.

As well, while many may be concerned about additional saturated fats in any high-fat diet, it's probable that additional fat doesn't contribute to arterial damage because in cases of weight loss and/or fat loss it provides energy in a calorie deficient environment. In short, the extra dietary fat is eaten up for energy rather than contributing to cholesterol buildup in arteries.

Likewise, one would expect that the loss of body fat on the diet would decrease the amount of existing atherosclerosis. Though much more research needs to be done in this area, it seems likely that becoming a "fat-burning" machine would have a very positive impact on cardiovascular health.

Several studies have also shown that certain types of fats, including the monosaturated fat oleic acid (found in olive oil and also in red meat) and polyunsaturated fatty acids, such as alpha linolenic and linoleic acids actually lower serum cholesterol and LDL levels. We should also realize that saturated fats are not all bad. Certain saturated fats (such as stearic acid that, along with palmitic acid makes up most of beef's saturated fats) have little effect on serum cholesterol and don't raise LDL. In fact, in some studies, stearic acid has been shown to actually lower LDL serum levels. The reason may be that stearic acid, which makes up about half the saturated fat in meat, is readily converted in the body to a monosaturated fatty acid.[9]

In summary, the general consensus seems to be that the low-carbon chain saturated fatty acids such as lauric (12 chain), myristic (14 chain), and even palmitic (16 chain) can adversely affect serum cholesterol levels, and stearic is relatively neutral,[10,11] unless consumed in large amounts. In that case, it can reduce levels of both LDL and HDL.[12] On the other hand, recent studies have shown that saturated fats may have some beneficial effects. For example, in a study using rats, a saturated fatty acid diet decreased the amount of intestinal damage caused by acute irradiation.[13]

Also, while the mono and polyunsaturated fatty acids are felt to improve the lipid profile, this is not necessarily the case. For example, there seem to be differences between different isomers of fatty acids and trans isomers of oleic acid, which are found in partially hydrogenated vegetable oils, tend to elevate serum cholesterol.

While the pros and cons of various fats and their effect on serum lipids are still somewhat controversial, we should also be aware that high-carb diets might also be harmful.

The High-Carb Diet Is Not All It's Cracked Up To Be

I've been skeptical of the high-carb "cure for everything that ails you" diet for many years. The Metabolic Diet is a prime example of my feelings about high-carb diets. It's a diet that helps you find the lowest carb level you need to function optimally.

In other words, you get to eat as many carbs as you really need and no more. It's only by controlling your dietary carbs that you can maximize your muscle mass and minimize body fat.

Unfortunately, this simple fact has yet to filter down to the masses and as such the high-carb diet is still king of the hill. That's too bad because it's a diet whose time has come and gone and it's only because of ignorance that it's constantly being resurrected.

OK, so maybe the high-carb diet isn't the best diet for those who exercise and want to improve the way they look and perform. But all kinds of studies have shown that the high-carb diet is the best diet for a healthy heart, right? Actually that's not right either. And recent studies are showing just how unhealthy a high-carb diet can be. The latest example is a study published in the Journal of Cardiology.[14]

According to this study, replacing saturated fats with carbohydrates did not have the beneficial effects that experts thought it would. Researchers led by Dr. Gerald Reaven, at the Stanford University School of Medicine, studied the effects of a high-carbohydrate, low-fat diet on eight healthy volunteers.

They found that a high-carbohydrate, low-fat diet resulted in higher blood levels of certain triglycerides and lower levels of HDL. The high levels of triglycerides can also increase the risk to heart attacks and other health problems that add up to potential heart problems down the line.

Another study found that in middle-aged and older white men, a high level of triglycerides in the body might mean a higher risk for heart attack. The authors felt that high blood levels of triglycerides should be considered an independent risk factor for heart attack.[15]

In the study, men with the highest levels of triglycerides were more than twice as likely to have a heart attack when compared to those with the lowest triglyceride levels. An excess amount of triglycerides in blood is called hypertriglyceridemia, which is linked to the occurrence of heart disease in some people. That seems to be because high levels of triglycerides can influence the size, density distribution and composition of LDL cholesterol leading to smaller, denser LDL particles, which are more likely to promote the obstructions in the blood vessels that trigger heart attack. Studies have also found that the popular low-fat, high-carbohydrate diet results in elevated triglyceride and lowered HDL levels, a double whammy for increasing your risk for heart disease.[16,17]

Refined Sugars Are Worse!

The use of refined sugars is even worse, especially in our sedentary population in which being overweight is the main nutritional problem. A high glycemic load causes hyperglycemia, hypertriglyceridemia, and low HDL cholesterol concentrations, especially in persons with some degree of underlying insulin resistance.

Consumption of high glycemic carbs (for example, a meal of chips and coke) is associated with an increased risk of developing type 2 diabetes in men and women.[18,19] Also, a high glycemic load has been related to increased risk of myocardial infarction.[20]

What Kind Of Diet Is Best?

Obviously the final word as to which kind of diet is best for decreasing cardiovascular risk factors is not evident and there is a dire need for prospective studies to resolve the issue as to whether low-fat, high-carbohydrate diets do more harm than good in relation to the development of CHD.

What is clear, however, is that a more moderate-fat, lower-carb diet is an alternative diet that may well have merit and be useful in the treatment and prevention of cardiovascular disease. What is also clear is that in some groups the use of low-fat, high-carbohydrate diets can have significant health implications and may be counterproductive. The bottom line here is that we, as a society, should rethink the "high-carbs-are-good" mantra and start listening to the facts.

Whatever the case, since the picture about the various kinds of saturated fats and their effects on blood lipids is still controversial, we urge you to establish a proper balance between omega-3 and omega-6 essential fatty acids, to use monounsaturated fatty acids (which have been shown to improve the serum lipids in every way) and certain types of saturated fatty acids in the Metabolic Diet as a way to decrease any concerns about cardiovascular effects.

Exercise And Cholesterol

As you may know, exercise can favorably affect many factors associated with atherosclerosis including cholesterol levels, blood pressure and glucose tolerance. In a study of 3,000 men, it was found that physical fitness correlated positively to body weight, body fat, and serum levels of cholesterol, triglycerides, glucose and systolic blood pressure.[21] In another study of nearly 3,000 women, a similar inverse relation between physical fitness and coronary artery disease risk factors was discovered.[22]

It's been shown that exercise is one of the most effective ways to control cholesterol levels and it works even if you don't lose weight. This is the message from a study out of Duke University Medical.

This is the first study to demonstrate that exercise alone, independent of weight loss or diet changes, can reduce the risk of heart disease.[23] The authors found that in seven mildly obese men and women, exercise resulted in an average decline in LDL and an increase in HDL.

The bottom line is that exercise is good for you even if you don't lose weight. On the other hand, if you exercise, lose weight and body fat, the health results are even better. In all, exercise and a proper balance of fats should be a part of any good diet and approach to cardiovascular health. They both play a strong role in the Metabolic Diet. Consequently, an exercise program structured just for the Metabolic Diet is presented in this book.

Cancer And Diet

As if it wasn't bad enough that the responsibility for coronary heart disease was laid at the doorstep of dietary fat while the carb connection went ignored, fat has also become a prime suspect in colon, breast and prostate cancer. There is even less validity to these claims than the dietary fat-heart disease link.

In fact, a number of studies cast doubt on any dietary fat-cancer link. Recent colon cancer research found no association between the consumption of red meat or total or saturated fat with the cancer.[24] Another study found the existing evidence linking fat and prostate cancer to be inconclusive.[25] Likewise, several studies examining the link between fat intake and breast cancer have shown little support for such a connection.[26,27,28]

Recent studies with animals have indicated that it may be total caloric intake, and not dietary fat, that causes breast cancer.[29,30] Tumor development seems to depend on a complex interaction between energy intake (calories), energy expenditure (exercise), energy retained by the body (body fat vs. lean body mass) and body size. In fact, one study offered evidence that dietary fat may actually reduce tumor growth.[31]

Other studies have identified body fat and overall weight, and not dietary fat, as prime contributors to prostate,[32,33] and breast cancer.[34,35] Another study has implicated alcohol intake as a prime contributor and states that the link between fat intake and breast cancer, while once thought to be important, is now questionable.[36] With the Metabolic Diet being so successful at decreasing body fat and the insulin-happy, high-carb diet so prone to creating it, we might be wiser to begin to spend some of our research time and money investigating a carb-cancer link than blaming so much on the usual whipping boy, dietary fat.

Insulin Resistance And Insulin Sensitivity

If you've been around the sports and fitness scene the past few years, you've heard a lot about insulin sensitivity and insulin resistance. Basically, these terms mean the ability of a certain amount of insulin to coax glucose into muscle and other cells. If the resistance is high then it takes more insulin to get the same job done than if the resistance to insulin was low. As well, it's assumed that the insulin response to glucose also applies to amino acids and fats. That is likely the case since this has been seen in a few studies, but it is far from being conclusively shown to be universal. Insulin and its effects, and the concept of insulin resistance are important topics and relevant to our discussion of the benefits of the Metabolic Diet. Because of this importance, I've decided to cover the topics in some detail and as such, the discussion may be somewhat technical. If it's a bit much the first time round, I suggest you skim over the next seven pages or so and then, if you're interested, reread the section in more detail at another time.

Insulin is the hormone responsible for moving glucose and other nutrients into various cells in the body. While getting energy in the form of glucose (or blood sugar) into our cells is an important function of insulin, it does so much more.

Recent studies have shown that insulin is involved in critical metabolic functions including the following:[37]

- Insulin is a key player in the control of the breakdown, formation and utilization of fat, both dietary and body fat. Excess insulin secretion and/or insulin resistance play a role in the genesis of weight and fat gain and obesity.

- Insulin inhibits fat breakdown and the clumping of platelets in the blood. In the presence of insulin resistance, the combination of altered fat levels in the blood (dyslipidemia), increased stickiness of the platelets (hyper-aggregation) and inhibiting the breakdown of blood clots (anti-fibrinolysis) may adversely affect the dynamics of arterial flow and, as such, increase the incidence of coronary artery disease and strokes.

- Preliminary evidence indicates that high levels of insulin (hyperinsulinaemia) per se, may be pro-oxidant (causes oxidative damage - the opposite of antioxidant) and therefore increase free radical damage to tissues in the body and accelerate ageing.

- Insulin plays a role in mediating diet-induced thermogenesis, the amount of energy that is released subsequent to the digestion and absorption of food. Thus, insulin resistance may be implicated in defective thermogenesis as seen in diabetes. Decreasing thermogenesis can lead, among other things, to weight and body fat gain.

- In the kidney, insulin spares sodium and uric acid from excretion. In chronic hyperinsulinaemic states, these effects may contribute to high blood pressure and high levels of uric acid in the blood (hyperuricaemia) and thus gout.

- Insulin increases the excitability (hyperpolarises) of the plasma membranes of both excitable and non-excitable tissues and, as such, may lead or contribute to serious cardiovascular and other problems including both low and high blood pressure, dizziness, rapid or slow pulse, irregular heart beats (arrhythmias), and heart failure.

- Finally, by crossing the blood-brain barrier, insulin exerts a host of central effects, collectively resembling a stress reaction.

The Usual Suspects

A person who is insulin-resistant has cells that respond sluggishly to the action of insulin. After a meal, this person will have elevated blood glucose levels that in turn signal still more insulin to be released from the pancreas until the glucose is taken up by the cells. The net effect is that for a given diet and blood sugar level, a higher level is present in someone who is insulin resistant than in someone who is not.

But insulin is also responsible for moving fats and amino acids into various cells. Sluggishness in moving these nutrients has a number of implications. For example, a relative lack of insulin may hinder some of the anabolic effects of exercise (we'll talk more about this in a subsequent chapter). As well, people who are insulin-resistant often have elevated triglycerides. Since elevated triglycerides usually coincide with low HDL, both are risk factors for cardiovascular disease.

All in all, insulin resistance, or insensitivity, seems to be one of our hidden diseases. Many of us suffer from it in one degree or another, and it may become clinically significant as we age and gain weight. Increased insulin resistance affects us at a very basic level by influencing the way we handle the food we eat. At one end of the scale insulin resistance can result in a bothersome increase in weight and body fat while at the other it can contribute to adult-onset diabetes (type II), a disease that affects more than 15 million people in North America.

The fact that an insulin-resistant subject may not become diabetic does not mean that they don't suffer from serious symptoms and diseases. The usual signs and symptoms of insulin resistance include fatigue, both after you eat and generally throughout the day and especially at night, weight and body fat gains, increased blood pressure, increased cholesterol levels, and perhaps a general feeling of unwellness. Unabated insulin resistance sets in motion of series of events that play an important role in the development of high blood pressure, stroke, coronary artery disease and adult-onset diabetes.

Thus the insulin resistance syndrome can set the stage for more serious disease. The syndrome is characterized by six traits: insulin resistance, glucose intolerance, abnormally high insulin levels, high triglycerides, low HDL, and hypertension.

Being More Sensitive Is Good For You

It's been shown that high blood pressure and low levels of HDL account for about half of the higher-than-normal risk of cardiovascular disease in diabetics. In a study it was also shown that elevated levels of insulin appear to make people prone to blood clots. This finding may explain why diabetics are so susceptible to heart attacks and strokes since about 75 percent of people with type 2 or adult-onset diabetes, the most common type, die of heart attacks or strokes.

A 1999 study, published in the *Journal of the American Medical Association*, was set up to determine the role elevated insulin levels play in this increased susceptibility. The researchers studied about 3,000 people enrolled in the Framingham Offspring Study, a long-term examination of risk factors for cardiovascular disease. Participants included diabetics, people with its precursor condition, and non-diabetics. Interestingly, the authors of this study found that non-diabetics who had elevated insulin levels, and those with the precursor condition, had elevated levels of PAI-1 antigen, a chemical that impairs the blood's ability to dissolve clots.

What was also interesting was that, in the more common pre-diabetic condition, in which glucose intolerance is found but the person is not considered diabetic, both insulin levels and levels of PAI-1 antigen were even higher than that seen in diabetics. Whether the person is clinically diabetic, prone to diabetes, or perhaps even those with lifestyle-dependant insulin resistance, one effect of insulin resistance is to make the blood less able to dissolve clots.

Based on their findings, the researchers suggest that exercise, which makes the body more receptive to the effects of insulin, might improve a person's ability to dissolve blood clots and possibly lower the risk of cardiovascular disease. The results of this study add to a growing body of evidence that supports the contention that insulin resistance does contribute to increased risk for heart disease.

The Other Benefits

As well as the important cardiovascular health benefits, increasing insulin sensitivity also helps you to increase muscle mass and decrease body fat. That's because, while insulin is a powerful anabolic and anticatabolic hormone, it has to be tamed and controlled in such a way that it also leads to decreased body fat deposition and increased use of body fat for energy. This book will present in-depth information on how to tame insulin resistance.

Why Does It Happen?

While insulin resistance is very prevalent, it's also not that difficult to increase insulin sensitivity. Unfortunately, while we have an idea of what causes insulin resistance and what measures can be used to treat it, we're far from knowing the whole story.

For example, recent studies have pointed to the cytokine TNFa (tumor necrosis factor-alpha) as a key molecular link between obesity and insulin resistance. In obesity, fat cells begin to synthesize and secrete TNFa, which interferes with insulin action by inhibiting the tyrosine kinase activity of the insulin receptor.

Investigations are now trying to determine the signal transduction and other pathways by which TNFa, through its receptors, inhibits the insulin receptor's activity and results in the subsequent metabolic changes. As more information is discovered more pieces of the puzzle will fall into place. We do know that the basic problem in insulin resistance is a decrease in the sensitivity of certain tissues to the effects of insulin. Why does it happen? Well, there are many factors involved.

Firstly, studies demonstrate that genetic mutations exist and predispose some individuals to insulin resistance. Individuals who possess a genetic predisposition have a higher probability for developing problems associated with insulin resistance, such as diabetes and obesity. The genetic differences and the subsequent consequences have been recently shown in some animal studies. For example, recent studies have shown that a genetic deficiency of the adipocyte fatty acid-binding protein (aP2) results in minor alterations of plasma lipids and adipocyte development but provides significant protection from dietary obesity-induced hyperinsulinemia and insulin resistance.[38]

Environmental Triggers

Secondly, consider how the environment acts on any genetic predisposition to result in varying degrees of insulin resistance. In an ideal environment someone with the genetic predisposition would not manifest the insulin resistance and, as such, would be unaffected by it. On the other hand, if the relevant environmental triggers (see below) were present that person would then show some insulin resistance. The severity of the insulin resistance would be in tune with the degree and number of triggers present.

Environmental Triggers for Genetic Predisposition to Insulin Resistance.

- **Obesity**
- **Dietary Carbohydrates**
- **Dietary Fat**
- **Lack of Exercise**
- **Lifestyle** (excessive alcohol consumption, stress, etc.)

Chapter 1 Dietary Carbohydrates

Obesity

Obesity is a major factor in increasing insulin resistance. People who are overweight show signs of insulin resistance more often than people who are normal weight.

So, although no cause and effect relationship can be clearly established (this is truly a case of the chicken and the egg) the association between these factors is a concern, especially because any of these symptoms, alone or in combination, increase one's risk for heart disease.

Dietary Carbohydrates

Diet is important, and studies have shown that a diet high in simple sugars can increase insulin resistance, resulting in chronic hyperinsulinemia. Over-consumption of refined carbohydrates, such as simple sugars, and starches such as found in baked goods, breads, pastas, and potatoes can be a contributor.

Normally, after you eat a meal, your body breaks down carbohydrates into glucose, or blood sugar. The presence of glucose prompts the release of insulin, a hormone produced in your pancreas. Insulin helps transport glucose from the blood to cells where's it's burned for energy or stored. When a person eats a lot of refined carbohydrates year after year, a dangerous cascade occurs. Insulin levels remain chronically high, and cells become less responsive to insulin. As a consequence, relatively little glucose gets burned and levels remain high. With chronically elevated glucose levels, insulin resistance may evolve into diabetes.

Elevated serum glucose levels also pose other health problems such as increases in free radical production. Glucose, a highly energetic compound (and the primary source of energy in the body), is spontaneously oxidized and spins off large numbers of free radicals. These free radicals react with other body components, such as cholesterol, and oxidize them increasing the likelihood of cardiovascular and other diseases. As well, high levels of insulin create still more free radicals leading to what researchers describe as "oxidative stress." High insulin levels increase the demand for vitamin E, which quenches free radicals. Also, insulin helps convert calories into triglycerides and cholesterol, increasing the risk of coronary heart disease.

High levels of glucose cause other problems as well. When chronically present in higher than normal levels, glucose can bind to proteins and "cross link" them, a process called glycosylation. Like free radicals, protein glycosylation has also been linked to an increase in certain diseases and aging.

Overall, contrary to popular thinking, the low fat, high-carbohydrate diet is not a good diet for dealing with insulin resistance. In an article,[39] Dr Reaven, who coined the term "Syndrome X" to describe the syndrome surrounding insulin resistance,[40] stated:

> "Increases in carbohydrate intake (with reciprocal decreases in fat content) within the boundaries of menus that can be followed in the free-living state have not been shown to decrease insulin resistance, either directly by enhancing insulin sensitivity or indirectly by producing and maintaining weight loss. However, such diets accentuate the metabolic abnormalities that constitute Syndrome X. Because substitution of monounsaturated or polyunsaturated fat, or both, for saturated fat results in the same fall in LDL-cholesterol concentration as seen with low fat/high-carbohydrate diets, it is concluded that low fat/high-carbohydrate diets should be avoided in the treatment of Syndrome X."

Dietary Fat

Eating too much saturated fat (such as beef) and omega-6 fatty acids (such as vegetable oils) also seems to increase the risk of insulin resistance. But, again, the effect of fat on insulin resistance is more complicated than most people think.

Saturated fat intake has been implicated in insulin resistance, but its role has yet to be accurately defined. It seems that there are different obesity genotypes (different genetic predispositions) that respond differently to low-fat, high-carbohydrate diets and to diets high in saturated fats.[41] Any response to fats in the diet is further modified by whether the person is gaining, maintaining or losing weight.[42] For example, a high saturated-fat diet would tend to increase insulin resistance in an obese person on a diet containing enough calories to maintain the present weight. However, it would not in a person who is on a diet that is restricted in energy (where calorie levels are less than needed to maintain weight).

As well, it's been shown that insulin resistance in fat cells may only occur when the high-fat diet is high in n-6 polyunsaturated fatty acids, but not when fat comes from mixed sources.[43] Recent research suggests that a diet high in n-3 polyunsaturated fatty acids may reduce the risk of developing insulin resistance, and as such breast or colorectal cancer.[44]

What is clear from the research thus far is that dietary fat intake does influence insulin action. However, whether the effect is good, bad, or indifferent is strongly related to several other factors. One of those factors is the amount of refined carbohydrate and calories in the diet. Higher levels of carbohydrates in the diet on their own and in concert with the saturated fats in the diet can result in increased insulin resistance.[46]

Another factor is the fatty acid profile of the dietary fat. Studies have shown that there are differences in insulin binding and glucose transport in cells grown with different types of fat in the incubation medium.[45] Different fats have also been shown in animals and humans to vary in their effects on insulin secretion and insulin resistance.

There seems to be an adverse effect of saturated fats, a neutral but perhaps protective effect of polyunsaturated fats such as is found in certain vegetable oils, and the proven protective effect of the essential omega 3 fatty acids such as is found in some oils such as hemp and flax, and fatty fish and fish oil. These same patterns of dietary fatty acids that appear beneficial for insulin action and energy balance are also the patterns that would seem appropriate in the fight against thrombosis and cardiovascular disease.

Not only is the type of fat important but also whether or not it has been refined, processed or oxidized in some way. For example, in the process of converting vegetable oils into solid fats, a process known as partial hydrogenation, some unsaturated bonds are converted to an unnatural trans position. These trans fatty acids often will occupy receptors meant for normal fatty acids and as such may cause cellular metabolic and structural problems.

In humans, trans fatty acids have an adverse effect on the blood cholesterol profile by increasing LDL and decreasing HDL. In addition, positive associations between intake of trans fatty acids and coronary heart disease have been observed in epidemiological studies. Given all the associations between trans fatty acids, dyslipidemia and heart disease, it's been hypothesized that trans fatty acids increase insulin resistance.

However, the above information on fats and insulin resistance is not the whole story. Although we're aware of some of the basic information much more research is necessary to define how dietary fats work to affect insulin action.

Lack of Exercise

Being overweight is known to increase your risk of developing insulin resistance. On the other hand, being a thin couch potato is not much better since the lack of exercise can also increase insulin sensitivity and is somewhat comparable - in terms of your body's metabolic activity - to being fat. Exercise has been shown to have dramatic effects on increasing insulin sensitivity via increased oxidative enzymes, glucose transporters (GLUT4) and capillarity (increasing the smallest vessels and thus the flow of blood) in muscle as well as by reducing abdominal fat.[47]

A recent article corroborated the beneficial effects of exercise in lowering insulin resistance.[48] The authors, by conducting a review of currently published clinical trial data, came to the conclusion that physical activity can reduce insulin resistance and improve glucose intolerance in obesity.

The bottom line is that regular exercise (and I stress the word regular since any kind of exercise done consistently will produce results), even a daily walk, will increase insulin sensitivity and has other beneficial effects on serum lipids and on the cardiorespiratory system.

While exercise is good, you have to keep at it to keep reaping the benefits. That's because the effects of exercise only last as long as it's being done on a regular basis. For example, in one study with obese children exercise improved plasma insulin and triglyceride levels and decreased body fat levels.[49] However, the effects of the exercise on insulin and serum lipids disappeared shortly after the training stopped.

Lifestyle

Poor lifestyle choices such as not getting enough sleep and chronic stress, predispose one to insulin resistance, secondary to elevated stress hormones such as cortisol and the catecholamines.[50,51,52] Although alcohol has been independently associated with insulin resistance and elevated serum insulin levels,[53] in moderation it may actually improve insulin resistance.[54]

What To Do

So, what should you do for preventative measures if you're worried that you might have some degree of insulin resistance? There are some obvious solutions. For example, if you're overweight, simply losing up to 10 or 15 percent of your current body weight can bring blood pressure down and increase your cells' sensitivity to insulin. Since exercise is an important component for both weight loss and improving insulin sensitivity, it's another obvious choice. Exercise also improves lipid profile and raises HDL blood levels, even without weight loss. Also, straightening out your lifestyle would be a good choice. Getting enough sleep and decreasing stress in your life would go a long way to increasing insulin sensitivity.

The next step would be to improve your diet. A diet high in protein and low in carbohydrates, where any carbs are derived from complex carbohydrates and low-carb vegetables, would also help. Higher-fat levels in the diet, to complement the low-carbs, as long as there's a healthy helping of the omega 3 fatty acids, would also be useful.

While we can improve our lifestyle and diet and start exercising, there's more to our insulin sensitivity arsenal. That's because there are a number of nutritional compounds, including chromium, fish oil, lipoic acid and vanadyl sulphate, that are very effective for decreasing insulin resistance and secondary problems such as hypertension, heart disease and diabetes. Later on we'll cover the ins and outs of dieting and supplementation and how to best decrease insulin resistance and increase insulin sensitivity.

The Bloating Of America

Along with the chronic insulin response, the high-carb diet also decreases testosterone and growth hormone secretions. This puts you in a position where the three critical hormones for body shaping and tone (insulin, testosterone and growth hormone) are not optimized. This is going to make it very hard for you to firm up and look good.

Many people also report becoming passive and less motivated toward exercise and other physical activity when they're eating a lot of carbohydrates. They begin to feel dull and less energetic. Again, this is not something that's going to help you lose weight and shape your body. Much of this passiveness may be linked directly to the biochemical effects of a carbohydrate-rich meal.

High-carbohydrate meals (depending on the composition of the meal) tend to increase the level of the chemical serotonin in the brain. When serotonin production is stimulated and increased you become more relaxed, tired and ready for sleep. It's serotonin levels that are affected by the popular antidepressant drugs such as Prozac. Likewise, the carbohydrate-serotonin connection is one of the reasons why so many people crave sugar when they're upset. They're simply looking for the relaxation a good jolt of carbohydrates and increased serotonin can bring.

When you factor in the probability that meals high on the glycemic index, like sugars, may cause increased production of serotonin than low glycemic foods,[55] it's no wonder people reach for those candy bars and other treats when they're feeling down.

The serotonin increase caused by a high-carb diet can also leave you with a kind of "who cares?" attitude. Alertness can be affected. On the Metabolic Diet, where carbs are much reduced, you don't get this kind of sleepy, weakened response. This could be one of the reasons why people on the Metabolic Diet claim to feel more energetic and alive.

They also claim to be more motivated, both at work and at play. This is not surprising, given the Metabolic Diet's ability to stimulate increased hormonal activity. Historically, red meat has been a mainstay on the training table of many athletes because of the belief that it aids motivation and performance. Evidence from those on the Metabolic Diet strongly supports the wisdom of this belief.

Because the high-carb diet also makes you retain more fluid, a feeling of bloatedness may persist after meals. This can really slow you down and land you on the couch when you could be out enjoying your life. The Metabolic Diet not only allows you to eat those foods that you've denied yourself on all those trendy, carbohydrate-based diets but also gives you extra energy to exercise, socialize and do all those things you never had the time or will to do before. This, in turn, will help you firm up your body and become a happier, more active person.

The Establishment Won't Like The Metabolic Diet

In case you're wondering, don't expect the major food industries in our society to begin shouting with glee upon the publication of this book. They're not going to like it. Go down the aisles of any supermarket today and you'll see little but fancy, processed carbohydrates on the shelves. Meat, which we concentrate on in the Metabolic Diet, is simple. It's also very difficult to package for big profits. It wouldn't be in the interest of the major food industries to support this diet. The bottom line rules.

A similar situation exists with the run-of-the-mill vitamin and nutritional supplement industry. Most of the supplements they tout will be of little use here. That's because when you're on this diet you need supplements that do more than the cheap formulations bottom-line companies supply. Sure you can use the help from a more sophisticated supplement array, but you won't get it from the Flintstone boys.

Later on we'll be giving you an idea of some supplements that you can use to maximize the fat loss and body shaping potential of the Metabolic Diet, but they'll be specialized in nature. They'll also go well beyond the somewhat useless stuff that the supplement industry often fills their shelves with. In fact, I've formulated an entire line of nutritional supplements that follow the ideology and science that's behind the Metabolic Diet. More on that later.

Those modern day gurus of nutrition who think that the quality of a diet should be measured by the torture it extracts on its converts won't be pleased with this diet either. The "If It Tastes Good, Spit It Out" school will also be up in arms. The Metabolic Diet is not torture. You'll be eating meat during the weekdays supplemented by a wide variety of other delicious foods. And when the weekend comes and the carbohydrate loading phase of the diet begins, virtually anything goes.

While you may have to give up that lasagna and ice cream during the week, you can have it during the "carb-loading" portion of the diet that comes every weekend. Unlike the high-carb diet and others of its ilk, you aren't forced to give up your favorite foods forever on the Metabolic Diet. While the gurus are "sweating to the oldies," buzz-cutting their blonde locks and tying their flock to the nutritional torture rack, you'll still be enjoying the foods you love.

For those who need the extra carbs to function efficiently, you'll be able to determine the minimum amount of carbs you need so that you can still maximize muscle mass, minimize body fat and feel good.

Being Committed

Though the Metabolic Diet is a radical departure from other diets, it still shares one thing in common with them. Like any diet, if you don't follow it, you're not going to get results. It will require some discipline.

The good news is that, if you properly follow the diet, it's a sure thing. I know the whole idea of a higher-fat diet may sound bizarre. It may counter everything you've ever been led to believe about diets, fat and carbohydrates; but it works. It is a biochemical inevitability. You will lose weight and shape the body you want if you follow the diet properly. Given the disappointment and heartbreak most diets bring, what more can you ask for?

Chapter 2

Benefits Of
The Metabolic Diet

Chapter 2: A Fitter, Firmer You Without The Torture

Weight Loss And A Fitter, Firmer You Without The Torture

For more than 30 years the American public has been told to watch its fat intake or suffer dire consequences. The national "fat hysteria" got so bad that back in 1989 the National Academy of Sciences advised everybody, regardless of their risk for coronary heart disease, to go on a restricted diet low in fat. The Experts of Low fat loved this. So did the food industry, which proceeded to take advantage of the situation, as it always does, by coming out with a whole new line of "low fat" or "fat free" products, many of which were neither.

This type of diet was perhaps understandable for those with cholesterol problems or genetically prone to coronary artery disease. However, why groups such as premenopausal women and children, who are largely immune to coronary heart disease, should go on such a restricted diet was not explained. In fact, the Joint Working Group of the Canadian Paediatric Society and Health Canada, following an extensive review of the literature, concluded that a numerical target for total fat intake for children is inappropriate.[56]

Meanwhile, other complex interlinking causes of coronary heart disease like lack of exercise, obesity, stress, genetics and caloric intake went largely ignored. Fat was the culprit. Any possibility that dietary fat could be utilized in the cause of good health and physical performance was conveniently dismissed.

As a result, people began eating carbs like never before and avoiding fat like it was the plague. And, guess what? As a society we have gotten fatter than ever, even though we have cut down (total food energy intake from fats is down to 34%) on dietary fat.[57,58] The heart attack parade hasn't stopped. What's wrong with this picture?

Meanwhile, people found that those carb-rich diets weren't exactly taking the weight off. Some got even fatter. Many others found themselves losing weight temporarily but gaining it right back. Still others found that they'd lost weight but hadn't even come close to shaping the kind of body they were looking for. Most either gave up or resigned themselves to a life on the diet roller coaster.

But now you've got an alternative; a healthy and effective one. One that allows you to lose weight and tone your body without having to give up your favorite foods forever. It's called the Metabolic Diet and it's got the Experts Of Low fat and diet gurus who want to make your life miserable on the run. In this chapter we'll outline the many benefits to be gained from the Metabolic Diet and begin to look at the reasons why it works. By its end, I don't think you'll be too tempted to return to the old grind of that high-carb diet.

Physical Benefits Of The Metabolic Diet:

Weight Loss without Drugs

- **Weight Loss Without Drugs**
- **Decreasing Body fat Without Sacrificing Body Tone**
- **Maximizing The Effects Of Endogenous Anabolic Hormones**
- **Losing Body fat In The Right Areas**
- **Increases In Energy, Even While Losing Weight**
- **Decreases In Catabolic Activity In The Body**
- **Avoiding The Health Problems Of The High-carbohydrate Diet**
- **Very Forgiving**
- **Easier And More Natural**
- **Fewer Plateaus**
- **Increased Endurance**
- **Weight Maintenance With More Calories**

The higher-fat/lower-carb intake of the Metabolic Diet naturally decreases appetite and reduces food intake. I've seen this repeatedly in my patients and others who have tried the diet.

Part of this effect on appetite may be from the increased production of cholecystokinin (CCK), a peptide hormone produced by the gastro-intestinal tract and released in the body.

In experimental studies CCK has been shown to influence both satiation, the process that brings eating to an end, and satiety, the state of inhibition of further eating. Fat and protein, but not carbohydrates, increases the natural production of CCK and thus may effectively reduce food intake.[59]

Although we have a natural appetite suppression from CCK, there is a select group of people who may benefit greatly from a program combining various weight loss nutritional aids and even diet pills with the Metabolic Diet. For example, it's been shown that a combination of dieting and anorexiant drugs can produce a synergistic effect especially helpful to some individuals who are extremely obese or resistant to weight loss.[60] We'll cover in detail (Chapter 10) the beneficial effects of using some nutritional supplement formulations when on the Metabolic Diet.

For many people, though, the Metabolic Diet and a moderate program of exercise will provide them with everything they need to lose weight. While the use of some nutritional supplements is beneficial, given the health risks involved with diet pills, you'll generally be a lot better off not using them.

The amphetamine-like diet pills now on the market possess a number of troubling side effects and can lead to abuse and addiction. Other medications like fenfluramine (Pondimin) and dexfenfluramine (Redux) work by affecting serotonin levels in the brain but they also have their problems. They can cause depression and drowsiness and there have been reports of short-term memory loss linked to these drugs.

In September 1997, both compounds were removed from the market because a certain number of people using these compounds had evidence of cardiac valvular disease.[61] This information prompted manufacturers to withdraw dexfenfluramine and fenfluramine from the market.[62]

Besides all the health problems associated with the use of diet pills, using diet pills or some of the nutritional supplements alone in order to lose weight, even if you lose the weight you want, can leave you looking small and thin, without much muscle tone. You may be thin, but you still look flabby. And when you go off the supplements or drugs, more than likely you'll gain all that weight back again. You haven't learned how to maintain your weight or gone through the necessary lifestyle changes to stay slim.

Bottom line, for most people who want to lose weight, drugs will not be an issue with the Metabolic Diet. We'll talk more about diet pills and a possible application to the diet in a later chapter, but, for most of you, these drugs would probably do more harm than good.

Decreasing Body fat Without Sacrificing Lean Body Mass

One of the problems with the high-carb diet is that, when you lose weight, an awful lot of body tone and muscle can go with it. You can end up looking like a starved chicken. This doesn't happen on our diet. Far from what you've been led to believe, eating fat doesn't lead to getting fat. In fact, a higher level of dietary fat is instrumental in increasing lipolysis, or the breakdown of fat,[63] in the body as long as the daily total caloric intake does not exceed daily caloric output.

On the high-carb diet, if you exercise correctly and do everything else right, you'll find that about 60 percent of your weight loss is fat and 40 percent muscle. On the higher-fat/lower-carb diet, I've found that in some cases those percentages can go way down to over 90 percent fat and less than 10 percent muscle and that's a real boon for someone who wants to maintain body tone as he or she slims down. With the higher-fat/lower-carb diet, you get down to the weight you want and lose more body fat, but you also find yourself maintaining a lot more of the lean body mass that makes you look fit and firm.

To visualize this, let's take two women who weigh 150 pounds and are virtually identical. One is put on a popular high-carb diet; the other on the Metabolic Diet. If they both lose 10 pounds, you'll find the one on the higher-fat/lower-carb diet losing more body fat while retaining more lean mass and muscle tone. She will not only have lost weight, but retained a firmer body as well.

Often, on the high-carb diet, you'll find people dropping weight but retaining too much body fat. They still look flabby. At the same time, they'll lose muscle tone and their body ends up looking shapeless. What's the use? The Metabolic Diet will help you lose weight while getting you a body with less fat and more shape. Given the choice, which diet would you rather be on?

Losing Body fat In The Right Areas

If you're overweight, there are probably parts of your body that cause you particular distress. For many people the stomach, thighs and backside cause particular troubles. Often, on the carb-based diets, you'll begin to lose weight but not in the areas where you're at your worst. For instance, your face may become slim while your thighs stubbornly refuse your weight loss efforts. It can be very frustrating.

One of the great things about the Metabolic Diet is that you lose weight in those most troublesome spots from the very beginning. On a higher-fat/lower-carb diet, one of the first places a man will begin to lose weight is in his stomach. While other diets may find it nearly impossible to deflate that spare tire, it's one of the first places the higher-fat/lower-carb diet attacks.

On women, the thighs are also affected quickly. You'll be losing body fat in other areas around the body, but you'll find that stubborn cellulite melting away quickly. What happens on the higher-fat/lower-carb diet is that fat stored on your body is treated like dietary fat and is burned to provide energy for the body as needed.

This doesn't happen on a carbohydrate-based diet where your body will do almost anything to save those fat depots. Glycogen and then muscle are used up to provide energy once immediate stores in the bloodstream run out. When the body begins to starve, its metabolic rate slows (and thyroid hormone levels fall) to use as little energy as possible.[64] Depot fat will eventually be used but only at a very slow rate.

You don't see as much of a lowering of basal metabolic rates on the higher-fat/lower-carb diet. The body continues to hum along using both dietary fat and the fat on your body for energy. Those pesky, stubborn depot sites in the stomach, thighs and buttocks melt away equally with other body fat as your body slims and firms. This is especially true of the stomach in both sexes. In fact, one of the most noticeable initial effects of the Metabolic Diet is the immediate impact it has around the middle.

Maximizing The Effects of Endogenous Anabolic Hormones

This diet maximizes the serum levels of the Big 3; testosterone (even in women[65]), growth hormone and insulin to help firm up and shape your body as you shed fat. If you're exercising, you'll be surprised at how quickly you'll be able to sculpt the body you want as these hormones work together.

Chapter 2: Increases In Energy

This is one of the most remarkable effects of the Metabolic Diet and it doesn't come easy. Many hormones are reactive to others. For instance, as insulin goes up, growth hormone may decrease. If insulin decreases, growth hormone may increase. The two substances generally don't work together, but they can. If you can increase both substances, you'll get better results shaping your body and keeping it firm than with an increase in one hormone alone.

Later we'll provide some supplements that you can use with the Metabolic Diet that will help in increasing insulin sensitivity, testosterone, growth hormone and IGF-1 as needed. Some of you will be very serious about your goals and may be seeking to take the advanced path a bodybuilder normally takes. Others will just be interested in keeping the body firm and shapely. Your approach to supplements and exercise will be largely determined by how far you want to go in remaking your body. Whatever your goals, you'll find the Metabolic Diet an effective tool in taking the weight off, keeping it off and making your body look it's best.

Increases In Energy

Many people complain about a loss of energy when they go on a diet. They may feel tired and weak and this is understandable because, on a high-carb diet, they're also losing a lot of muscle and strength. Their body may be losing fat, but it's also losing its tone and spring. As well, the higher-carb levels lead to a yo-yoing of insulin and the consequent changes in mood and energy.

This isn't true of the Metabolic Diet. Except for the very early stages of the diet when the body is making the metabolic shift to burning fat for energy, you retain your energy and drive. In fact, many people on the Metabolic Diet often find their energy actually increasing as they lose weight and body fat. Thanks to the synergistic effects of the Big 3 hormones working together, you lose less muscle as you lose weight and may even increase strength.

People can't believe it as they watch the fat melt away while their energy and strength increase at the same time. This just isn't supposed to happen on a diet, but it does when you've become a fat burning machine on the Metabolic Diet.

Decreases In Catabolic Activity In The Body

By "catabolic" we mean forces that break down muscle and use it for energy. When existing muscle is broken down, your body will lose its tone and may become flabby. The Metabolic Diet, accompanied by proper exercise actually results in the body producing lower levels of cortisol, a hormone secreted by the adrenal glands that leads to catabolism. By lessening catabolism we insure that the body retains important muscle mass and tone while you lose weight.

It has been shown that the carb-loading phase of the diet results in decreased cortisol levels. In one experiment the hormonal effects of muscle carbohydrate loading manipulations followed by a carb poor diet were studied.[66] Carb loading provided decreased levels of cortisol not only during the carb-loading phase but also in the following carb-poor time period.

Avoiding General Health Problems Associated With The High-Carbohydrate Diet

When insulin is chronically high, or yo-yos up and down due to a diet consistently high in carbs, it serves as a lipogenic (fat producing) hormone and lays down fat, especially in the thighs and other fat-plagued areas of the body. This contributes to formation of cellulite that drives women crazy. That's why we control insulin on the Metabolic Diet. Though we increase carbohydrate consumption on the weekend to optimize body toning potential it is done only to the point where the dieter begins to lay down fat. At that point it's back to the higher-fat/lower-carb diet before increased insulin does any damage.

This shift between the two phases of the diet also results in significant changes in the glycemic and insulin responses the body has to both the carb restriction and carb loading.[67]

The increase in plaque buildup in the arteries that leads to heart attacks also appears to be a result of the chronically high-carb diet. If you stay away from the simple sugars and junk food you can limit the damage. Of course, it would be hard to severely criticize someone who eats a lot of vegetables, salads and potatoes.

Still, all those carbs will lead to fat buildup unless you regulate it as we do in this diet. The Metabolic Diet spikes insulin production through carb loading on the weekends and thus speeds the movement of nutrients through the bloodstream and into muscle. This aids efforts at body shaping. But before the insulin levels have been elevated too long and fat begins to be laid down in bulk, the carbohydrates are cut down and insulin brought under control.

The Forgiving Nature Of the Metabolic Diet

The Metabolic Diet is a no-nonsense approach to weight loss. It's not a part of some trendy, Hollywood-fueled "miracle" cure. It's meant to be used over the long-term for weight loss and successful weight maintenance and fitness. You'll get the body you want, but you have to stick with it over the long haul.

This being said, I must also tell you that the Metabolic Diet is very forgiving. Even if you go off the diet for a while and get back on again, you'll eventually get the weight loss you desire. It's a given fact that you will succeed with this diet even if you fall off the diet and jump back on a few times.

There are also going to be times when you may be away from home, on business or with family and friends, and you won't be able to stay within the confines of the diet. What we've found in the past is that these short periods away from the diet lead to little, if any, weight gain. As long as you jump back on the diet when you return to your regular routine, you'll be OK.

Many times someone will go off their diet and become so disappointed with themselves that they give up on the diet totally and go back to their old ways. They feel bad about themselves and their "lack of will power" and, in a way, punish themselves by giving up on the diet. There is no need for that on the Metabolic Diet. In anyone's life, there are going to be peaks and valleys. You may as well admit it to yourself right now. You are going to blow it sometime.

With the Metabolic Diet, it's important to forgive yourself when you blow it because there's no need for any long-term self-loathing. The diet will forgive you and, as long as you get back on it, you'll be fine. Be patient with yourself. Trust the diet. Chances are, in most cases, you won't do yourself any harm by going off it for a period. You can have your moments of weakness and still succeed. The Metabolic Diet is a long-term approach to weight loss and maintenance and it's your devotion to it over time, not any minor short-term failure, which will determine your success.

It's Easier And More Natural

The Metabolic Diet is not that difficult to stay on, especially in relation to other diets. It's certainly not like those low-fat diets where you struggle mentally and physically throughout the year and can't help but go off it out of sheer frustration and exhaustion.

Bottom line, the Metabolic Diet is a lifestyle; one you can live with. You can keep it up year round. It's very comfortable because it's natural. It punctuates higher-fat/ lower-carb periods with regular carb sessions in much the same manner as our ancient ancestors' diet. The diet is flexible and can be tailored to individual energy and activity demands.

You also don't give up anything on this diet. Even if you do well on the strict very low-carb part of the diet, you can have that meat and cheese on the weekdays, and on the weekends load up with your favorite carbs. Even in it's strictest form it's not torture like most other diets. Do you want to have a social drink or feast on the weekend? Go ahead. All foods are available, albeit at the right time of the week, on this diet. Allowing for times of self-indulgence, unlike many of the other fad diets, helps you adhere to your diet.

Fewer Plateaus:

Plateaus, lengthy periods where you will experience no progress, can be a real problem on any diet. They can drive you crazy. You'll be doing everything you're supposed to be doing and, all of a sudden, hit a brick wall. Weight loss stalls short of your goal. This can destroy your momentum and ruin your motivational outlook.

Fortunately, these plateaus occur far less frequently on the Metabolic Diet. The metabolic shift you make to becoming a "fat burning" machine insures consistent fat loss while the overall energy increase and loss of the couch potato mentality resulting from those dulling high-carb meals keep motivation at a high level. You simply feel better and more energetic on the Metabolic Diet and this pays large dividends in staying active and doing the things necessary to maximize weight loss and body toning.

Increased Endurance:

Though the diet in itself will result in weight loss, exercise will be necessary to making the diet as successful as it can be. Along that line, we've provided an exercise program to use with the diet later in this book. With the success you achieve from a combination of the diet and an exercise program, you may find yourself becoming a real "gym rat" if you don't watch out. Exercise, in and of itself, can be very addicting and it will become even more so when you see what it can do in combination with the Metabolic Diet.

Some of you, however, may be concerned about overall endurance on a higher-fat/lower-carb diet. The popular belief is that physical endurance is related to the amount of carbohydrates stored in muscle. Many feel that a diet where less carbs are consumed, like the Metabolic Diet, leads to a state where you get tired faster.

Nothing could be further from the truth. Here's the way the body really works to burn energy. In the popular high-carb/low-fat diet, when you begin exercising, most of the glucose in the blood is used almost immediately for energy. At that point, the glycogen or carbohydrate stores in the muscle are used for energy. After 15 minutes or so, they're gone too. At that point, your body has to revert to burning fat or existing muscle for fuel, along with forming glucose from amino acids and other gluconeogenic substances.

Unfortunately, when you're on the high-carb diet, your body isn't very efficient at burning fat. Sure, you'll burn some fat for energy. But, in some instances, almost half of what will be burned for energy will be protein (the source and substance of all muscle), either directly or through gluconeogenesis. If you want a body that looks firm and fit, burning protein and muscle isn't a good idea.

Once you've shifted over on the higher-fat/lower-carb diet, though, your body is primed to use fat for energy.[68] In fact, it won't even use up your glycogen stores before getting into using fat as a primary energy source. That way the glycogen can be used when it's really needed rather than being wasted on lower level activity where fat is an effective energy substitute.

While preserving the glycogen you have so that your endurance will be even higher than if you were on a high-carb diet, your body will primarily tap into those fat stores for the energy it needs. Fat becomes almost like sugar to the body, and it will favor utilizing fat stores over muscle stores for energy. In this way, the body stores less fat and more of it is used.

With the Metabolic Diet, the body is much less likely to make fat and more likely to burn it off. Better body tone results. If you're interested in shaping your body or even going further and doing some beginning bodybuilding, the Metabolic Diet is the diet you want to be on.

Weight Maintenance At A Higher Caloric Level: Those who have previously experienced some success on other diets and switch to the Metabolic Diet will find a big surprise waiting for them. My experience with the diet shows that you will be able to maintain your weight and be able to eat a greater number of calories each day with the Metabolic Diet.

For instance, recently I was working with a gentleman who'd been maintaining his weight on a strict 2,700 calories per day carb-based diet. When he went on the Metabolic Diet and made the metabolic shift, he found he could maintain his weight at 3,000 calories plus. That's weight maintenance at an increase of at least 300 calories a day. He was able to eat a lot more but still keep the weight off.

I believe that part of the reason for this is that some of the energy obtained from the oxidation of body and dietary fat is used to make glucose through gluconeogenesis. Although you don't take in many carbohydrates in the low-carb phase of this diet, the body uses up glycerol (from the metabolism of fat) and amino acids, and other compounds to make glucose.

Thus, some body fat, dietary fat and other substances are used up to provide the body with a small supply of sugar. Since this process takes energy, and doesn't happen to any degree on high-carbohydrate diets, you can lose more weight on the same number of calories and maintain your weight on more calories on the Metabolic Diet than on any other kind of diet. This fact alone would be reason enough to make the switch to the Metabolic Diet.

The Metabolic Advantage

At this point, a little biochemistry lesson may be in order so you can get a better idea of why the Metabolic Diet is superior to the competition. Adenosine triphosphate (ATP) is the source of all metabolic activity in the human body. In order to get the energy the body needs for muscle contraction, breathing, brain cell function and virtually all other activities, ATP must be generated. People have gotten the idea that you must have the glycogen and the glucose that comes from carbohydrates for the body to produce and replenish ATP and survive.

What people don't understand is that the body can produce glucose without taking in carbs (gluconeogenesis) and that protein and fat can be used to provide energy and replenish ATP. It is a misconception that you must have dietary carbs to function. This is likely only true in some cases where a person may be genetically challenged as far as utilizing fats efficiently. And even in these cases it's unlikely that there will be a need for the extremely high levels of dietary carbs now being called for by various groups and agencies.

When carbohydrates make up the bulk of your diet, you basically burn the glucose from the carbs as energy. Recall that glucose enters the bloodstream and it's either used for immediate energy or stored as glycogen in the liver and muscles. The glucose not stored as glycogen is made into triglycerides (body fat). When needed for energy, the stored glycogen is converted back to glucose and used up directly by cells or transported through the bloodstream to other body cells for conversion and use as energy.

When fat and protein make up a greater part of your diet, you don't have a large amount of glycogen or glucose available for energy anymore. A good part of your energy will come from the breakdown of free fatty acids in your diet or from the fat stored on your body. As we discussed, some of the energy will come from glucose that is produced mainly from glycerol and amino acids. Instead of burning all the stored glycogen or glucose for energy, the body burns free fatty acids or triglycerides (the storage form of the free fatty acids) and the glucose that it makes.

Basically, a diet high in fat activates the lipolytic (fat burning) enzymes in your body and decreases the activity of the lipogenic (fat producing) enzymes. Dietary free fatty acids and triglycerides become the body's main energy source. The triglycerides are broken down to free fatty acids and some of the fatty acids are metabolized to ketones, which in turn can be used for energy by body cells. The use of ketones for energy is especially important to the brain that can only use glucose and ketones for energy. In short, the free fatty acids and ketones take the place of glucose and the triglycerides act like glycogen.

Chapter 2: Protecting Protein

When carbs are the main form of energy, the body produces insulin to process it and store it. This is all well and good but, as we discussed above, one of the problems with insulin is that it activates the lipogenic enzymes on the body and decreases the activity of the lipolytic enzymes. What this leads to is an increased storing of body fat and a decrease in the amount of stored fat that will be burned.

The exact opposite occurs on the higher-fat/lower-carb diet. After undergoing the "metabolic shift" from being a carb-burning machine to a fat-burner, lipogenesis (the production and laying down of fat on the body) decreases, and lipolysis (the burning of both dietary and body fat for energy) increases. You're burning fat as your primary fuel, and instead of using glycogen or breaking down precious protein, you'll burn off the fat on your body for energy as needed.

This can have a big effect on overall body fat, and research has now begun to document the fact that while on a higher-fat lower-carb diet, weight loss is due to the almost exclusive loss of body fat.[69] In one study of ideal-weight human subjects, it was found that higher-fat diets were accompanied by a very strong lipolytic effect.[70] In another study focusing on obese subjects, it was found that, when offered high-carb/relatively low-fat diets or lower-carb/relatively higher-fat diets, the subjects on the lower-carb diets lost significantly more fat.[71] Though prevailing wisdom would predict that the higher-fat diet would simply make people fatter, they actually lost more weight on a high-fat diet.

It may sound crazy, but that's the way the body works. Contrary to what most people believe, fat oxidation is regulated primarily by carbohydrate intake rather than by fat intake.[72] Once you've adapted to a higher-fat/lower-carb diet, fat doesn't beget fat. Despite what you've been told, a properly designed diet higher in fat and lower in carbs doesn't put fat on. It takes fat off.

Similar eye-popping results have occurred in animal studies.[73,74] Meanwhile, I've seen the positive effects on people of a higher-fat diet time and time again in my own practice. The fat melts away. At the same time, as a bonus, body tone can be improved markedly thanks to the "protein protecting" nature of the diet.

Protecting Protein

One important by-product of the "metabolic shift" that takes place when you move from a high-carb to a good, higher-fat/lower-carb diet is that fat protects protein in the body. When you're utilizing carbs as your main source of energy, the body tends to save its body fat and will preferentially take muscle protein, break it down and form glucose from it to burn as energy when the immediate energy stores are exhausted. This is why on a high-carb diet a significant amount of muscle catabolism can take place.

Exercise should play a role in any diet. Every doctor or fitness expert will tell you that. If you want to come anywhere close to getting the kind of weight loss you want and shaping up your body, exercise is a necessity. Unfortunately, with the high-carb/low-fat diet, once you've exhausted carb based primary and secondary energy stores you're going to start burning some muscle for fuel when you're working out.

The fact is that anytime you're exercising and the body needs energy it will break down what it needs, including muscle, to supply that energy. One of the ways athletes fight this is to sip glucose drinks during a workout. The body won't need to break down muscle as much for energy because it has an outside source of energy constantly coming in. The problem here is that with the constant glucose ingestion you get chronically elevated levels of insulin and a decrease in the oxidation of body fat. Instead of losing fat by exercising you're actually preserving it.

Fat works in the same way as glucose when you're on the Metabolic Diet. It protects the muscle by serving as an alternate, more available source of energy and it does this without having to take in more calories since the body has learned to oxidize body fat to provide that needed energy. So now when you exercise you don't need to take in carbs to spare your muscles. Your body will burn up your excess body fat to provide the energy it needs to exercise at the same time sparing muscle protein.

On the high-carb diet you may find yourself in a gym, happily working away, but you'll be sacrificing muscle in the effort. If you look around you'll find examples of people who seem to be at the gym all the time, working on the treadmill or step machines and doing some weight training, but they just don't look the way they should.

They may be slender, but their bodies lack tone and they're stringy or shapeless. With all the work they're doing they should be looking like someone on one of the covers of the magazines they've got in front of them while they walk the treadmill, but they're actually burning off muscle and sacrificing tone. You can bet they're not on a higher-fat/lower-carb diet.

The Metabolic Diet works against this tendency. Some muscle will be burned, but available fat will serve as an alternative to muscle as an energy source so a minimal amount will be lost.

What we're concerned with here is "catabolism" or the breakdown of muscle tissue. Again, I know it may sound strange, but although most people think that exercise only creates muscle it also breaks it down. Research upholds that the Metabolic Diet could well also be called the "Anti-Catabolic Diet." Along with enabling the body's hormonal system to better burn fat it decreases the amount of muscle that could be lost during a workout or just during day to day activities, by protecting muscle protein. This is very important to someone wanting to shape his or her body for maximum attractiveness and fitness.

Research has shown that the ketone bodies (beta-hydroxybuterate and acetoacetate) burned for energy in a higher-fat/low-carb diet, actually decrease protein catabolism.[75] A study with laboratory rats also showed that a combined treatment with insulin, testosterone and a high-fat/high-protein diet led to decreased loss of muscle protein caused by the catabolic hormone corticosterone.[76] Another showed higher protein gains and lower fat gains for rats on a high-fat diet.[77] The implications for similarly decreased catabolism in humans with the higher-fat/lower-carb diet are obvious.

In my own practice, I've also noticed that body fat seems to be more mobile when the Metabolic Diet is being used. As discussed above, when you begin to lose weight you often have a very hard time losing it in problem areas like the thighs, buttocks and stomach. Weight seems much more evenly lost throughout the body on this diet. Problem areas are much more easily attacked.

Recently I've been working with a patient who, throughout her life, has maintained a large store of fat in the buttock, inner thigh and lower abdomen areas. Whenever she diets she gets skinny from the waist up but doesn't lose much from the waist down. No diet has ever successfully slimmed these areas. But with the Metabolic Diet she's lost fat evenly throughout these areas. Much of the cellulite that has bothered her throughout her life has disappeared and this has only aided in motivating her to take her weight loss and maintenance efforts further.

Fat distribution also seems more evened out with the Metabolic Diet. What fat remains on the body seems to be distributed more equally on the frame.

Metabolic Benefits Of The Metabolic Diet

- **Burning Fat Instead Of Glucose Promotes Lipolysis (Fat Loss)**
- **Burning Fat Instead Of Glucose Decreases Lipogenesis (Fat Production)**
- **Without Dietary Fat, The Body Stores Fat In Excess**
- **Muscle Protein And Body Tone Are Protected**
- **Body fat Is More Mobile And Pleasingly Distributed**

You just don't have those pockets of fat that plague people. Fat is distributed in a more pleasing ratio across the body making any body shaping efforts on your part that much easier.

Fat Can Be Your Friend

People have a bad attitude about dietary fat, and its most often based on mistruth rather than facts. They think that if you eat fat, you get fat. That's what everybody in the media, medical and food industry is telling them. Why question it?

The fact is, sometimes you've got to question authority. The reality is that the less fat you eat, the more your body will want to store it and pack it on when given the opportunity. Much of this comes from the chronic levels of high insulin caused by high-carb diets discussed earlier. These chronic levels will really pack the fat on when present. The more carbs you eat, the more insulin you'll produce and the more fat you'll pack on. Though it may sound odd, the truth is that you'll gain more fat with the high-carb diet than the high-fat/high-protein plan we're giving you here.

The body also acts very conservatively, especially in matters of survival. When it is receiving little dietary fat, it begins to crave it. Fat is an excellent source of energy in an emergency and the body realizes this. It anticipates disaster and wants to store up fat as a hedge against hard times. When dietary fat is minimal, as it is in the typical high-carb diets, the body will compensate by packing on body fat. You're in a double whammy situation where insulin is packing on fat from all those carbs and the body wants to store it because of its overall lack in the diet. No wonder people can blow up like blimps on those carb-based diets and stay that way!

On the Metabolic Diet, the opposite occurs. The body recognizes it's got fat in abundance and biochemically recycles it. It doesn't have to be concerned with fat storage. Face it. If you want to lose fat, the higher-carb based diets can't compete with the Metabolic Diet in any way. The higher-fat/lower-carb diet radically activates the enzymes for fat breakdown in the body. You become, basically, a fat burning machine and you'll use up the fat you've just ingested and the fat already stored on your body much more readily.

The Psychological Edge

Along with its many physical and metabolic advantages, the Metabolic Diet gives its devotees a strong psychological edge that dieters on the standard carb-based diet lack. Diets, by their nature, are psychologically tough. Just the word "diet" is enough to send many people running to the refrigerator for a soothing, reassuring mouthful of whatever it is they're not supposed to eat.

"Diet" implies sacrifice, of doing something that will be unpleasant. They can be almost impossible to stay on and, if you weren't already depressed by the diet itself, the fact that you find yourself giving up and abandoning it can really send you into a tailspin. For those who've had a weight problem over the course of their lives, a failed diet can bring about a real loss of self-esteem and be both personally and socially debilitating.

Chapter 2: **The Psychological Edge**

The Metabolic Diet is a whole new animal. It's not the usual life sentence on the dietary torture rack. It's a plan for weight loss and maintenance that you can stay on for life.

It has the practicality and flexibility you need to survive in the modern social world yet still manages to melt away body fat and shape an attractive body like no other diet on the market.

It also possesses built-in motivational and psychological advantages that help you adapt to the diet and stay on it.

Psychological Benefits Of The Metabolic Diet

- **Increased Energy**
- **Decreased Mood Swings**
- **No Need To Banish Favorite Foods Forever**
- **Sociability**
- **Convenience**
- **No Hunger**
- **Weekend Relief**
- **Losing The Carbohydrate Cravings**
- **Builds Confidence**

Increased Energy

We mentioned above the physical benefits gained from the increased energy people seem to experience with the Metabolic Diet. This increased energy also aids in your psychological approach to the diet by supplying an aura of health and well being that increases your motivation and commitment to the diet.

We don't really know yet if there is a biochemical mechanism responsible for this increase in energy but we do know that free fatty acids, triglycerides, ketones and protein provide just as sound an energy base as those carbohydrates everybody raves about. Red meat is also high in creatine, which is one of the compounds that increases the supply of high-energy phosphates in the body and the availability of ATP.[78]

Where you'll likely have an energy problem is when you're overdosing on carbs and adversely increasing serotonin levels in the brain. Those excess carbs have been the making of more than one "couch potato". Likewise, if you go back and forth between diets like some people have tried to do, the constant transitioning between high fat and high-carb metabolisms will also really take it out of you.

Though the Metabolic Diet contains a carb-loading component, it isn't of the duration necessary to return the body to a glucose-burning metabolism. Insulin and carbohydrates are controlled and manipulated in the Metabolic Diet. This helps provide the proper body tone the dieter desires as he or she loses weight while insuring that carbs aren't overdone to the point they begin to pack on body fat again.

Decreased Mood Swings

We've been pleasantly surprised to find that those nasty, chronic mood swings people seem to experience on most diets don't occur on the Metabolic Diet. Much of this seems to be the result of eliminating the chronic insulin swings you get on a carb-based diet. It's common on a carb diet to eat a high-carb meal and find yourself feeling down for a while. Then, all of a sudden, you'll find yourself picking up again. Your moods run in cycles, up and down, on a constant roller coaster.

On the higher-fat/lower-carb diet, you don't have this kind of swing. You can eat a steak and then feel like running a mile. Contrary to what others may say, a meat meal doesn't seem to "sit in your stomach." It's when the carbs are mixed with meat, as in a steak and potatoes meal, that the debilitating feeling of heaviness sets in and you end up on the couch for the rest of the night.

Again, our bodies were designed and evolved to process meat and use it for energy. The body has a very efficient method of burning fat. Unless you mix it with carbs, a meal featuring dietary fat will find you ready to go rather than being stuck in the doldrums, ready for siesta time.

There's No Need To Banish Your Favorite Foods Forever

Timing is all-important on this diet. You may be limited in what you can eat on different days of the week, but you can always satisfy a craving for any food during the appropriate time of the diet's 7-day cycle. You just have to eat it at the proper time.

Unlike other diets, you won't have to give up all your favorite foods while on the Metabolic Diet. Psychologically, you don't end up feeling like you're some kind of diet martyr constantly sacrificing the foods you love.

It's Social

One of the major problems with most diets is that they're anti-social. You're so restricted in what you can eat that, when you go to a party or other social function, you find yourself putting other people off because of your special nutritional needs. You can't eat what they do and you end up alienating them or feeling like an outcast. With the carb-loading phase of the Metabolic Diet, these problems are greatly diminished. On the weekends, when most social activities take place, you're eating anything anybody else can eat. If you want to have pizza and beer, that's OK.

Chapter 2: No Hunger

The Metabolic Diet is also very convenient, even if it's a weekday and you're away from home. Meat is a staple of this diet and any restaurant you go to serves some form of it. Just order a steak, push away the fries, and substitute with a salad or cheese. You can even go to McDonald's if you want. Just tell Mayor McCheese you want a plain double quarter pounder. Then throw the bun away, put on some mustard and dig in.

No Hunger

Most people on a diet end up starving themselves. They're constantly thinking about food. When's my next meal? What can I eat? What can't I eat? They're always famished. That doesn't happen on this diet.

With the Metabolic Diet, your body requires more calories to maintain itself. Even when losing weight, you're probably not going to be starving yourself as you would be on a high-carb diet. You won't have those cravings where you want to eat 10 chocolate bars.

The fact is, even if you're scrimping on calories and you've really got the diet dialed in for maximum weight loss, you may get some hunger but nothing like you'll get on that high-carb diet.

Fat is more satiating. It will delay the onset of hunger. You feel fuller after you eat. This is probably because protein and fat together don’t increase insulin to a great degree. When you're on the insulin roller coaster with the high-carb diet and your body notices blood sugar falling, it puts in an emergency call to eat! That won't happen on this diet. You'll find yourself losing body fat and looking good and, perhaps for the first time in your life, you won't be famished.

It's Simple To Apply

On weekends, of course, you won't have to worry about the food you eat with the Metabolic Diet. Anything's fair game. During the week, things get a little tougher, but not much. All you have to remember is to keep your carbohydrates at the lowest level that’s best for you. Anything else - bacon, ham, eggs, steak, cheese - go for it. There are no long charts. No recipe books. If you just keep your dietary focus on meat and keep your daily caloric intake within reasonable levels, you can't go wrong.

Meat is an amazing food. It's one of the best, most nutritious foods we have available. It has a number of beneficial nutrients no other food possesses. For day-to-day functioning, it can't be beat. That, and its advantageous fat content, makes it a mainstay on this diet.

Weekend Relief

You aren't on a crusade here. Even on the strict low-carb phase the weekends allow you to eat the foods you may have been craving, but don't be surprised if, after being on the diet for awhile, you find yourself losing your desire for excess carbohydrates. In fact, when the weekend comes and Saturday morning hits, you may find yourself not really interested in carbs anymore.

Still, once you get that first carb-load in you and the insulin rush begins, you'll find yourself in love with them again. The love affair will pass, though. By sometime on Sunday, at least if you're able to stay on the strict assessment phase of the diet, you'll find that you're generally tired of all those carbs and more than ready to get back on the higher- fat, lower-carb part of the diet and leave the doldrums behind.

Even if you find that you need more carbs to function optimally, you'll still be able to increase your carb intake on the weekend, if you wish. On the other hand, you may just want to stay at a fixed carb level all week as long as you're making progress and add a 'cheat' meal on the weekend.

For those on a fairly low-carb diet, going through the low- and high-carb phases isn't all that hard. That's one of the great things about this diet. Once you get tired of a particular phase, it's just about over and you're allowed to switch back to the other.

Builds Confidence

After being on the diet for awhile, you'll see all that lost body fat and increased body tone and realize that, hey, this really isn't that difficult. Success breeds confidence and confidence breeds even more success. Pretty soon you're on a steamroller headed straight for the body you've been dreaming of.

Diabetes And The Metabolic Diet

Diabetics have been and still are almost universally put on a high complex-carbohydrate, low-fat diet. Why? Because it's generally felt that this type of diet was necessary for controlling the diabetes and that it reduced the cardiovascular risk factors especially in overweight type 2 (non-insulin using) diabetics.

In the past few years several studies have pointed out the high-carb diet is less than ideal and that a diet higher in fat and lower in carbs is the best diet for diabetics. For example, in a recent study the use of a monosaturated fatty acid-enriched low-calorie diet resulted in a lessening of cardiovascular risk factors compared to diabetics who were put on a low-calorie, low-fat diet.[79] Both insulin-dependent (type 1) and non-insulin dependent (type 2) diabetics can take advantage of the Metabolic Diet to lose weight. Diabetics with compromised kidney function should, of course, consult with their physician before embarking on a high-protein diet.

Chapter 2: Diabetes And The Metabolic Diet

Type 2 diabetes, by far the most common, affects more than 90% of the almost fifteen million North Americans afflicted with diabetes. It goes hand in hand with obesity and is associated with insufficient insulin output and some degree of insulin resistance.

Often weight loss and a proper diet is all that's needed to keep it under control. The Metabolic Diet, since it both decreases body weight and increases insulin sensitivity, is an excellent diet and lifestyle management plan for type 2 diabetics, and it's also useful for the smaller number of insulin-dependent or type 1 diabetics.

The effect of the Metabolic Diet on insulin requirements in type 1 diabetics and on the use of medications in type 2 diabetes, while variable, usually results in less medication being needed. In fact, insulin sensitivity increases if the Metabolic Diet is used along with exercise and some targeted nutritional supplements. Although many diabetics find that their insulin or medication requirements may be lower, it may not be depending on the type of diet that was followed before embarking on the Metabolic Diet.

If a diabetic followed the usual dietary guidelines (a diet that is high in carbohydrates, low in fat, and low in cholesterol [80]) recommended for diabetics, then medication needs or insulin levels may go down during the low-carb phase of the diet. If the diabetic disregarded the dietary guidelines and ate a diet higher in protein and fat and lower in carbohydrates, then the medication needed may not change appreciably.

As I mentioned previously, another factor that must be considered is exercise. The exercise program recommended later on in this book is useful for managing and decreasing the need for medication in both types of diabetics. Not only can regular physical activity help transport glucose into muscle cells without the presence of insulin, but we also see an increase in insulin sensitivity secondary to exercise.[81] The overall effect of exercise is to decrease the need for insulin and diabetic drugs needed to control the diabetes. However, diabetics should be ready to adjust their meals, their insulin intake, or both to prevent hypoglycemia during, immediately after, or even six to 12 hours after exercise.

Many diabetics have asked me just why they even need insulin or medications that imitate the action of insulin or stimulate insulin secretion if they hardly consume any carbs. The answer is that although the low-carb portion of the diet allows the burning of fat for energy, there is still a need for insulin.

First of all, the body will produce a certain amount of glucose from gluconeogenesis and the body needs insulin to properly use this glucose. Even more important, however, is that some stages of fatty acid oxidation require insulin. Although the initial steps of fatty acid oxidation do not require insulin, the final steps do including the regulation of ketone production and the oxidization of ketone substrates into carbon dioxide and water.

Without insulin, ketoacidosis would occur. This occurs because when there is a lack of dietary glucose, the body increases the use of fats for energy. It oxidizes fat to ketones without insulin but can't go any further unless insulin is present. If insulin is absent or reduced, the ketones build up and cause ketoacidosis, a potentially dangerous and sometimes fatal condition.

Most diabetics who have gone on the diet find that their blood glucose levels may go up if they overdo the carbs on the weekends. Weekdays are not usually a problem. If a problem surfaces on weekends, then lower glycemic carbs should be used as the main source of carbs (see Appendix 2).

Because different carbohydrates are digested at different rates and have different effects on glucose levels, glycemic indices have been developed for use in helping a diabetic in maintaining control of their blood sugar. Several studies have shown that low-glycemic-index foods produce low blood glucose and insulin responses and improve blood glucose control in type 1 and type 2 diabetic patients.[82,83]

Both type 1 and type 2 diabetics should monitor themselves very closely whenever they change diets or their exercise level. So it goes without saying that they should do so in the initial stages of the Metabolic Diet. With the availability of self-monitoring, I often recommend that diabetics check their glucose levels at various stages of the diet until they become familiar with the effects of the diet and exercise on their systems.

They should also be sure to monitor their glucose levels during and after exercise until they become familiar with how they respond. As well, serum cholesterol, total triglycerides, HDL, and LDL should also be checked while on this diet. During the first two or three weeks after switching to a low-carb, high-fat diet, serum lipid levels may rise.

However, they usually return to baseline or lower after the adaptation phase. If you're a diabetic and you're using the diet to lose body fat and firm up, you should find that these values should improve compared to your normal values. That is, total and LDL levels should go down and HDL levels should go up.

I've had several diabetic patients on my diet and found that as they lost weight and became fitter, and the amount of insulin or oral agents that they used dropped significantly. Some type 2 diabetics who were on oral agents were able to control their diabetes with diet and exercise alone.

Chapter 2: Dietary Fat And PMS

Dietary Fat And Premenstrual Symptoms

Most women experience some premenstrual symptoms (PMS) including fatigue, backache and some irritability. These symptoms are perfectly normal and certainly nothing to worry about. But an estimated 40 percent of all women (the exact percentage varies according to the study) in their reproductive years suffer much more severe symptoms that can adversely affect their personal and professional lives. Food cravings, panic reactions, extreme irritability, wide mood swings and inappropriately aggressive behavior can result.

Some women report feeling like "a different person" and have trouble coping with normal relationships and situations. Marriages may become difficult. Irrational thoughts and behavior can plague them. Other women may experience even more severe reactions. They may feel that "they can't go on like this" and become depressed to the point that even suicide may be considered.

Premenstrual syndrome exists when any of the above symptoms occur in any two consecutive menstrual cycles. The symptoms must be present before menstruation and absent soon after menstruation begins. Sometimes they can last as long as 16 days, starting two weeks before menstruation begins and spilling over into its first 2-3 days. In such cases, where symptoms are severe, the effects on a PMS sufferer can be very severe indeed.

Interestingly, PMS has only come to be fully studied in recent decades. Much of this can be explained by the fact that the total number of menstruations a woman may experience has increased greatly in this century. Women are generally more healthy and likely to survive through the reproductive years than in previous centuries. Likewise, a century ago women bore several more children during their lifetime and breast-fed them for longer periods. Amenorrhea (absence of menstruation) could last almost uninterrupted for two and perhaps even up to 3 decades for women who were frequently pregnant. As a result, PMS was frequently avoided.

Today, women have much fewer children and seldom breast feed for more than three months. If you're only going to have two children and breast feed for a few months, you'll only be free from menstruation for 2-3 years. PMS can become a much more persistent and difficult problem to deal with in this case.

In line with declining birth rates and the increasing role of women in professional life, research on PMS has increased greatly in recent years. It's been found that severe PMS often occurs with the development of stressful life events and eating disorders are also common. Regular exercise and stress-reduction programs may aid the woman dealing with PMS; so may vitamin supplementation and the use of supplements that contain gamma-linolenic acid (GLA) and/or pyridoxine.

The use of oral contraceptive pills may also play a role, although in some cases PMS is worsened by the use of hormones. But while some women taking the "pill" may escape PMS they may also become "flat-mooded". They don't experience the feeling of well-being that can come postmenstrually. Women often find themselves at their happiest and most productive at this time and the oral contraceptive pill may rob them of this. They can also get out of synch with their body rhythms.

In very severe cases of PMS, doctors may suggest shutting down hormone production by the ovaries by either surgical removal of the ovaries or more commonly using drugs to create a kind of temporary menopause. Unfortunately, even when these radical procedures are chosen, only about half of women respond to treatment.

Of all possible remedies, it's conceivable that the Metabolic Diet could be the most promising. Women with PMS react with greater sensitivity to fluctuating blood sugar levels. While not suffering from hypoglycemia, they exhibit a similar adrenaline-like response that produces the eating disorders, panic reactions, irritability, aggression and mood swings normally associated with PMS.

Because the Metabolic Diet minimizes fluctuating blood sugar levels (due to lessened carb intake), it seems to have a positive effect on the symptoms of PMS. Research has supported this conclusion. In one interesting study, the diets of women suffering from PMS and a control group of PMS-free women were studied and it was found that the PMS group ate proportionally greater amounts of carbohydrates than the control subjects who consumed more protein and fat.[84]

Another study showed that a high-fat diet increased serum dehydroepiandrosterone (DHEA).[85] This, in turn, may have a very positive effect on PMS. Fluctuating hormone levels contribute strongly to PMS symptoms. DHEA is a natural hormone produced mainly in the adrenal glands that serves as a steroid precursor for estrogen and testosterone production. It is transformed into testosterone and estrogen in the sex organs and peripheral tissues of the body, like the arms and legs. This increase in the major sex hormones through DHEA is believed to level out those highs and lows that cause PMS.

Research is now focusing on the link between PMS and the natural narcotics of the nervous system like endorphins and enkephalins. These "opiods" are natural painkillers produced by the body that help relieve pain and create a feeling of well-being. It's believed that fluctuations of these substances may be at the root of PMS. The DHEA increase spurred by the high-fat diet and resulting sex hormone production may also level out these fluctuations. As well, the Metabolic Diet, with its emphasis on a higher dietary intake of fat, helps prevent fluctuations in beta-endorphin levels, a common problem with high-carb diets.[86]

Some observers have characterized PMS sufferers as sharing much in common with those who undergo withdrawal symptoms from drug or alcohol use. Given the apparent fluctuations in opiods that occur with PMS, PMS could be seen as partly resulting from some kind of natural opiod withdrawal in the body. Again, DHEA could be pivotal in treating this condition.

DHEA has also been shown to enhance memory[87] and provide protection against lethal viral infections,[88] cancer,[89] aging[90] and obesity.[91] The Metabolic Diet link to DHEA could be very important in establishing protection against these disorders.

The craving for carbohydrates that many PMS sufferers experience also seems to be positively affected by a higher-fat diet. As we pointed out earlier, when your body makes the "metabolic shift" to becoming a fat-burning machine the desire for carbohydrates has a tendency to disappear. You're no longer dependent on carbs for energy and your body's former need to stimulate natural narcotics to offset its imbalances no longer exists. That burning desire for carbs that can really cause you to pack on the weight is no longer a problem.

The Metabolic Diet also decreases water retention, another problem for menstruating women. Based on what I've seen in my practice and the proven biochemical advantages of the Metabolic Diet, I'd strongly encourage it for most patients who have PMS difficulties.

Seasonal Affective Disorder And The Higher-Fat Diet

You may have been seeing a lot about seasonal affective disorder (SAD) in the media lately. Lack of sunlight during the winter months seems to cause this disorder, which can result in serious depression. It's been widely reported in countries and climates that experience light deprivation during the winter months. Like PMS, SAD has been linked to carbohydrate cravings, weight gain and the neurotransmitter serotonin.[92,93]

In Canada last winter, I began treating some of these cases with the Metabolic Diet and experienced a great deal of success. On the higher-fat diet, their overall mood elevated greatly. Once they went off the diet they sunk back into their SAD symptoms quickly. I don't think it's coincidental that the SAD patient also experiences frequent carbohydrate cravings. With the Metabolic Diet dropping insulin levels and putting a stop to the insulin roller coaster that results from a high-carb diet, the higher-fat/ lower-carb diet could well be a substantial weapon in fighting SAD in much the same way that it seems to lessen PMS.

There's been very little research done on this to date, but the anecdotal evidence I've seen certainly suggests the Metabolic Diet as a very promising treatment for SAD. It's certainly an area where more research should be done. If you're just going on the Metabolic Diet and suffer from SAD, don't be surprised if your condition improves this winter.

Alcoholics And The Metabolic Diet

Alcohol can induce or exaggerate essential fatty acid (EFA) deficiency states, and can block the metabolism of linoleic acid to EFA metabolites, including the prostaglandins.[94] The Metabolic Diet, by modifying EFA metabolism, can mitigate some of the effects of alcohol and alcohol withdrawal.

Many alcoholics crave carbohydrates when they're not drinking. Though you'd expect the serotonin production stimulated by a high-carb meal to improve their mood, it doesn't. On the contrary, I've found that it creates a substantial deterioration of their mood. The deterioration in mood makes it more likely that these alcoholics will begin drinking again. This deterioration doesn't seem to occur on a lower-carb diet like the Metabolic Diet. As such, this diet could decrease the risk of relapse in reformed alcoholics. A high-carb diet may put their recovery at risk.

As you can see, the possible benefits of the Metabolic Diet go well beyond weight loss. Because of its ability to manipulate the production of important hormones, it may be a useful addition to standard methods of treatment for a variety of diseases.

Chapter 3

Comparing Diets

Chapter 3: Where Do They All Fit In?

High-Carbohydrate, Low-Fat Diets - Where Do They Fit In?

I'm a passionate man, especially about my work. While the Metabolic Diet is the result of my passion on the subject of nutrition, I realize it's not the only game in town. After all, there are plenty of others, including doctors, dieticians and other health professionals, that have their own ideas on diets and nutrition. A lot of them believe fervently that a high complex-carbohydrate, low-fat and low- to moderate-protein diet is the best way to go. Their views on what diet is the way to go are mainstream, supported by the majority of the population and backed up by plenty of valid research. So what's the problem?

Actually there isn't any real problem. I, as much as anyone, understand that the field of nutrition is still in its infancy and ever evolving. Today's conventional ideas may well become tomorrow's outdated views.

The Protein Story

As an example of this let's look at protein's checkered history. The history of protein requirements for athletes is both interesting and circular. In the mid-1800's the popular opinion was that protein was the primary fuel for working muscle.[95] This was an incentive for athletes to consume large amounts of dietary protein.

Because nitrogen must be removed and excreted in urine in order for protein to provide energy, an 1866 study measured urinary nitrogen excretions to determine the contribution of protein as fuel. From this study, the authors determined that protein provided for a small portion of the total fuel used by the body.[96] This suggested that protein was not an important fuel. This paper and others led to the perception that exercise does not increase one's need for dietary protein. This view has persisted to the present.

Recently, however, there is some evidence to show that protein contributes more than is generally believed. The data in the 1866 study likely underestimated the actual protein use for several methodological reasons. For example, the subjects studied participated in a mountain climb and consumed a protein-free diet before the climb. Also, post-climb excretion measures were not made, and other routes of nitrogen excretion may have been substantial.

However, based largely on these data, this belief has persisted throughout most of the 20th century. This is somewhat surprising because, in an extensive review of the literature prior to 1925, Cathcart[97] concluded "the accumulated evidence seems to point in no unmistakable fashion to the opposite conclusion: that muscle activity does increase, if only in small degree, the metabolism of protein." Based on results from a number of separate experimental approaches, the conclusions of several more recent investigators support Cathcart's conclusion.[98]

The Importance Of Protein

I've written a book on the importance of amino acids and proteins (*Amino Acids and Proteins for the Athlete; The Anabolic Edge*), and I believe that current dietary protein recommendations are insufficient for athletes and those wishing to maximize lean body mass and strength. These athletes may well benefit from protein supplementation if they're getting less than one gram of protein per pound of body weight. That's because with exercise and during certain conditions, the use of protein and amino acid supplements may have significant anabolic and anticatabolic effects.

The Bottom Line

The bottom line, in my view, is that diets that restrict added protein intake by athletes are not the best diets for athletes and those who want to increase body mass and strength and decrease body fat. Those that recommend lower protein diets just aren't keeping up with the scientific and medical literature. The RDA only addresses the need for protein to allay deficiencies and was set for the average American adult, not a vigorously exercising individual or even one who is on a restricted calorie diet in order to lose weight.

So What's The Best Kind Of Diet?

In the last 40 years I've seen a lot of accepted dietary 'truths' come and go. The most important thing I've learned in all this time is that you have to keep an open mind and be flexible enough to adjust your views according to the never-ending parade of new facts and information that comes on the scene.

The high-carbohydrate, low-fat, low- to moderate-protein diet is an outdated diet who's time has almost run out. Even though the attitude of those in the know towards these kinds of diets has changed, the new diet information has not reached the kind of critical mass it needs in order to become the logical successor to the diet crown. So while I, and many others, believe that the Metabolic Diet is the most advanced, scientifically based diet plan on this planet, there's still a vocal majority that hasn't discovered the vital facts and as such still sticks to the high-carb, low-fat idioms.

Paradigm Shift

A paradigm shift will soon occur as the new dietary information hits the critical mass and becomes accepted by the majority of people as the best diet for those who exercise, control their weight and decrease their body fat levels.

Chapter 3: Your Options

Your Options

There are all kinds of diets out there. Low-fat, high-fat, low-carb, high-carb, low-protein, high-protein, vegetarian, limited-food, wine-lovers diet, and all the mixes and matches you could imagine. The more popular ones are the high-carb, low-fat diets, the low-carb diets and the high-protein diets. All these diets have several subsections that treat the macronutrients differently but for our purposes we can lump them together under the broad categories.

The high-carb, low-fat diet is the most popular diet on this planet. That's because this diet has a lot of research behind it and as such is espoused by the American Dietetic Association and other health professionals. The premise behind this diet is that by cutting down on fat you cut back on the one macronutrient that provides the most calories and as such you lose more body fat. Not only that, but popular opinion holds that fat is bad and lowering dietary fat makes for a healthy heart.

Unfortunately, both premises are flawed. First of all, by cutting down on dietary fat you actually burn less body fat and tend to lose more muscle. So by cutting back on calories you'll lose weight but you won't be buffed. In fact, you'll look more like a starved chicken. Also, recent studies have shown that the high-carb diet raises serum triglycerides and lowers HDL and as such can lead to an increase in cardiovascular disease. And if that's not enough, the low fat diets can be too low in the essential fatty acids and may result in a problem with the absorption of the fat soluble vitamins, including vitamin A, D, E and K.

There are various kinds of high-protein diets. Some are based on low-fat and low-carbs, and more along the ketogenic diets, such as the Atkins' Diet. Others are based on moderate-carbs and fats, like the Zone Diet, or high- to moderate-carbs and low-fat, and are just a variant of the high-carb, low-fat diets mentioned above.

In all cases, the high protein levels are useful for those who exercise or are involved in sports. However, those that are low in fats and/or high in carbs run into the same problems as mentioned above with the high-carb, low-fat diets.

Low-carbohydrate diets such as the Atkins' Diet and other strictly ketogenic diets are great for losing body weight and dealing with some health issues such as glucose resistance and diabetes. However, long-term strictly ketogenic diets tend to result in decreased muscle mass. That's because they don't allow alternating periods of lower and higher-carb days. These alternating periods allow for favorable changes in the anabolic and fat-burning hormones.

The Zone Diet is a good all round diet that stresses lower-carb and fat levels and higher protein levels than is found in general diets. It's a good diet for losing weight while at the same time maintaining muscle mass. In fact, it's pretty close to the Moderate Carbohydrate Phase of the Metabolic Diet. Unfortunately, the Zone Diet suffers from the same fatal flaw as all the other diets out there.

None of them are up to snuff because they're all static diets based on fixed macronutrient content. The fact is that the one-diet-for-all approach just doesn't cut it genetically.

The Metabolic Diet on the other hand is a flexible living entity that is able to adjust to your needs, while at the same time finding the optimal carb level for maximum muscle mass and fat burning capability, and peak efficiency. By using the Metabolic Diet you can dial in your metabolism to the kind of diet that's best for you.

Most of the diet books on the market today are so similar that the same person could have written them. This includes books by physicians, PhD's and all the Jenny Craig/Susan Power types. They all offer variations of the diet high in complex carbs and fiber and low in fat. They also push exercise, lifestyle and behavior changes. Regrettably, none of these diets has much chance for success when the novelty has worn off and motivation wanes.

The reason they don't work is that they're basically all the same and usually depend on the personality of the writer rather than any real differences in the diets. Once a dieter has tried one of them they've tried them all, no matter how well they're disguised. None offer the novelty and biochemical advantages of the Metabolic Diet where you can lose body fat in even stubborn areas while maintaining or even improving muscle tone and body shape.

You also have to remember that a lot of these books were written by people who had weight problems themselves and lost the weight through the use of personalized methods. Because of this, they're wildly evangelical in their praise and biased to flaws in their diets. There's very little, if any, science or research support for many of the claims they make.

Exceptions To The "High-Carb" Mantra:

Food Combining

One approach to low-carb diets is the concept of food combining. There are several variations and diet books available that promote this concept, but the one consistency of them all is that there is little if any research supporting them. These diets are based on the premise that combining certain foods, such as starchy vegetables with meat, is 'bad' because they have opposite digestive requirements. Although these diets rightly encourage eating unprocessed vegetables and fruit, the

concept that a potato should be eaten three hours apart from eating a steak has no basis in fact. In fact, a balanced meal of vegetables, protein and a small amount of fat has been demonstrated to slow down absorption of all three foods and supply a constant source of energy without a high insulin spike.

A recent study adds some fuel to my fire (*International Journal of Obesity*; 2000;24:492-496). Although it looks at combining foods while dieting, the conclusions of this study apply to the effect (or lack of effect) of eating different macronutrients at different times. In the study, researchers at the University Hospital in Geneva, Switzerland, found that a diet in which different types of foods were consumed at different times of the day was no more effective than a standard low-calorie diet.

"Eat Yourself Slim," the new diet by Michel Montignac is a moderate-carb, food-combining diet based on French cuisine and wine. He maintains that it is the mixing of carbs and lipids that cause disturbances in digestion and cause weight gain. Therefore, his diet is a mix of "don't do this with that." Do not consume carbs with lipids, do not eat protein with carbs, eat fruit on an empty stomach and only before a carbohydrate choice meal, and wait three hours before switching from a protein meal to a carb meal and vice versa. All the carbs allowed are low-glycemic so no potatoes or carrots and only certain breads are allowed.

Bottom line? Like any book that advertises that you can eat as much as you want and lose weight, it's long on rhetoric and short on results. Michel's theories are flights of fantasy and simplistic. His food combining is both unnecessary and unproductive. The whole diet is one man's construction with absolutely no basis in reality. Any weight loss is a result of the complexity of the diet, decreased caloric intake and a healthy dose of the placebo effect.

"Sugar Busters" also recommends some food combining principles along with its low-carb and no-sugar approach. Again, fact and fancy are intertwined with the end product being confused and ineffective.

The Protein Power Plan

The Protein Power approach is one of the several variations of low-carb diets and rightly claims that most Americans do not eat enough daily protein. They offer guidelines to determine your protein needs based on your fitness level and lean body mass. The authors also stress daily fiber intake from leafy greens and other vegetables and provide information on how to maximize your fiber and minimize carb intake. Exercise, especially resistance training, is rightfully promoted along with the diet to increase and preserve muscle mass.

However, as many of the diet book authors do, they tend to attribute obesity in most people as a result of insulin sensitivity rather than overeating. However, we now all know that both are equally important.

Neanderthin

The Neanderthin Diet represents the extreme end of dieting approach: to eat like our early ancestors. The author of this diet advocates that many of our physical problems are due to the incorporation of "alien proteins" into our diet when we integrated agriculture into our society and nutrition.

The idea here is to return to our hunter/gatherer roots and eat only unlimited amounts of meat, raw and unprocessed vegetables and fruit. This basically excludes many foods such as grains, starchy vegetables, and legumes, which must be cooked to be eaten. Sugar and dairy products are not allowed, but plenty of meat, fish and nuts are. While this diet successfully treated the author's autoimmune disorders of obesity and rheumatoid arthritis, this diet is not even close to the answer to every person's maladies.

The Atkins' And Carbohydrate Addict's Diets

Dr. Robert Atkins' *Diet Revolution* stresses a moderate- to high-fat approach with moderate amounts of protein and few carbs. It's an effective weight loss program, but, unfortunately, it has several drawbacks. It is very difficult to stay on over a long period because there is no relief from its unrelenting regimentation. You stay on low-carbs every day of the week, every week of the year. Socially, especially on weekends, it is very tough to follow. It also doesn't manipulate the body's anabolic hormones, so you don't get that combination of toning and fat loss you get on the Metabolic Diet.

The *Carbohydrate Addicts Diet* suffers many of the same problems. Though it does allow for one carb reward period during the day, it's still very strict. It also treats carbohydrates as an addiction and misses the fact that in some of its forms it is a macronutrient almost foreign to our bodies. We may be an industrialized, computerized people but our bodies really aren't that different than our ancestors'. Like them, we're not meant to regularly consume large amounts of refined carbohydrates.

Another fault with these diets is that they tend to let the reader believe that daily calorie intake is not important. In other words, they promote an "eat all you want" approach. Unless these authors have discovered a way to fool the laws of nature, eating all you want will most likely not result in a change in body fat. It is a basic law of thermodynamics that in order for a person to lose body fat, he or she must reduce their calorie intake below their maintenance level.

All of these low-carb diets also try to permanently keep insulin down instead of using it productively. If it's controlled and used properly, as it is in the Metabolic Diet, insulin can aid in firming up your body without worry about the tremendous amounts of body fat it can produce.

Chapter 3: The Carbohydrate Addict's Diet

In the past there have been a number of diets on the market that have been not only ineffective in the long run but also dangerous. Some, such as the liquid protein diet, have actually been responsible for several deaths. The basis of many of these overzealous diet programs are the many myths that abound about nutrition and weight control: Myths that eating a certain kind or combination of foods speeds up the burning of excess fat (e.g. the grapefruit diet and the *Fit For Life Diet*).

Other myths are that allergies to certain foods make you fat (*Power Immune Diet*), that only one or two foods should be consumed by dieting, that the best way to diet is by fasting or modified fasting (the liquid protein diet), or that anyone can lose weight by changing one or two things about their diet or behavior. All in all, these diets and gimmicks try to leave the impression that by following their simple programs anyone can lose weight.

In the midst of all this misinformation is the desperate dieter who wants magic - an effortless way out from their psychological and social discomfort. These dieters are easy prey to the unprincipled purloiners of the diet cult who promise rapid effortless weight loss as a solution to their problems.

Whatever your needs and desires, you can usually find a diet that caters to yourself. There's a drinking man's diet, a vegetarian's diet, a mystic diet, the lazy man's diet, high-protein diets, low-protein diets, high- and low-carbohydrate diets, liquid protein diet, fruit juice diets, the no-food diets, the chemically balanced diet, the one-meal-a-day diet, the snacking diet, the modified-fast diets, the herbal diet, the meal replacement diets, the gorge-yourself-on-all-you-can-eat-of-certain-foods diet, etc., etc. The truth is, however, that most of these diets are not sound, and for many are another exercise in futility - to be tried and discarded once its discovered that they don't have the magic formula. Perhaps the next one...?

Authors of the most popular diet books are usually the ones that have little to say but have a great presentation. It's the personality of the author that sells the diet rather than the merits of their diet program. New diets appear yearly trying to capture the imagination of the overweight masses hoping for instant success.

Unfortunately, the talents of these authors rarely include medical or scientifically valid nutritional knowledge. The good diets are, well, boring. Most dieters know how to lose weight - but most are also constantly looking for the easy way out. Fad diets compete for the consumer buck and come and go so fast it's hard to know which ones are "in" or which ones are passé. Most diet books have a built-in obsolescence because of the inevitable disillusionment that follows the original short-term enchantment. The magic soon wears off when the diet becomes hard work. The Metabolic Diet is a new breed of diet that takes into account cutting-edge scientific and medical information to help you lose weight, and feel and look better. In fact you could say that the Metabolic Diet is really a lifestyle rather than a just a diet. It will change the way you look and feel and help you stay that way.

Chapter 4

The Metabolic Diet Plan

Chapter 4: How To Get The Weight Off And Keep It Off

How To Get The Weight Off And Keep It Off

In this chapter, we'll learn how the Metabolic Diet can be used to lose weight, melt away body fat and shape the kind of body you want. First, let me explain just how and why it works and clear up a few misconceptions about the diet some people may have. Let's make it perfectly clear that insulin is not the enemy. We're not mounting a campaign against it. In fact, it's only a problem when it's chronically high or yo-yos as it does on a carbohydrate-based diet.

The Metabolic Diet has two goals:

- Firstly, to help you lose the weight and body fat you want.

- Secondly, to create an attractive body through proper toning and shaping.

What you want to do with insulin, and what this diet focuses on, is to increase it at the appropriate time and place so it works to add body tone and maximize body shaping potential by increasing the flow of amino acids into muscle cells.

What we don't want is fat built up at the same time. That's why insulin secretion is controlled and limited. Instead of the chronically elevated insulin levels of the high-carb diet, the Metabolic Diet carefully manages insulin during the dieter's week so you get the advantages of body toning without packing on all that unwanted fat.

Insulin also works hand in hand with testosterone and growth hormone (GH) in body toning. Growth hormone is very important because of its role in cell growth and maintenance. During the weekdays when you'll be on the higher-fat/higher-protein/lower-carb portion of the diet, insulin levels stay fairly steady and don't fluctuate wildly, and GH secretion increases. Along with stimulating a great environment for body shaping, GH also induces cells to use fat instead of sugar for energy thus increasing the burning off of body fat and limiting its production.

Growth hormone acts almost like a "starvation" hormone. When your body's in trouble, when you're threatened or in a dangerous situation, GH kicks in to mobilize stores of energy in the body to deal with stress and increased energy needs. High-intensity exercise also increases GH levels.

Usually, insulin works to decrease the secretion of GH, but it appears that the body sees the great increase in carbs and insulin during the weekend portion of the Metabolic Diet as a stressful situation, much like exercise, and GH can actually increase with insulin. In this way, we can potentially get the positive effects of increased GH both during the week and on at least part of the weekends.

Testosterone, also critical to health and body toning, responds well to the Metabolic Diet. Preliminary research in this area has found testosterone is positively linked to dietary fat. In one study, premenopausal women placed on low-fat diets experienced decreased levels of both non-protein bound estradiol and testosterone (although postmenopausal women didn't experience the same deficiency).[99] In another promising study, animals fed diets high in cholesterol or fish oil experienced increased testosterone production over those fed a low cholesterol diet containing linseed oil.[100]

A study published in 1999 showed that in older men the consumption of a meat-containing diet contributed to greater gains in fat-free mass and skeletal muscle mass with resistance training than did an lacto-ovo vegetarian diet.[101]

Overall it has been my experience that there is an acute anabolic effect on muscle when a short-term lower-carb diet is alternated with carb loading. Cellular hydration is maximized by the water and carb loading intracellularly, and insulin sensitivity is increased leading to an intense anabolic stimulus. Constant fluctuations make for an anabolic effect unparalleled by any other diet. This anabolic effect allows you to tone and shape your body as you lose weight.

Controlling Muscle Breakdown

Along with shaping an attractive body, it's also important to ensure that the muscles you've developed aren't broken down. To do this you want to maximize the anabolic hormones such as testosterone and GH, and minimize the production and effects of catabolism (muscle breakdown) by catabolic hormones, the most critical of which is cortisol (cortisol also promotes fat storage). Much of this is done naturally through the Metabolic Diet. Since body fat stimulates cortisol production,[102] less cortisol is secreted as body fat is lost.

Along with the hormonal control, you'll also find the Metabolic Diet providing for psychological control. The wide mood swings and irritability you can get on a carbohydrate-based diet can also increase cortisone. In fact, psychological stress can be a prime component in its production.

The Metabolic Diet, in part by controlling insulin, can put a stop to the mood swings and irritability that plague the carb diets. It also minimizes the hunger, frustration and social stress created by other diets. Let's face it: any diet can be difficult. It involves changing lifestyles and any change can be stressful. But the flexibility, convenience and simplicity of the Metabolic Diet go a long way toward getting rid of the stress that normally accompanies a diet.

Chapter 4: Why Are We Overweight?

Metabolic Rate And The Importance Of Exercise

If you want to experience the maximum benefits from following the Metabolic Diet, you will need to exercise. Though it would be great to live in a world where you could go on a diet, spend the day in the living room couch and lose all the body fat and weight you want, this just isn't possible.

Many people with weight problems also suffer from metabolic rates that are lower than normal. There's a lot of discrimination against overweight people, and often people assume that anyone who suffers from a weight disorder eats like a horse. Though this is true in some cases, it's not in many others. Many overweight people possess a metabolism that just doesn't burn off calories very fast. They're very energy efficient. They naturally do what they need to do to live on less fuel. As a result, a lot of calories end up getting stored as fat.

No doubt, you've also run into people who seem to eat as much as they want yet never put on a pound. This is no magic trick. These people simply possess an increased metabolic rate. Not only that, but there is evidence that many people can actually increase their metabolic rate when needed to burn off more calories. The thin person can eat like a horse and have a speeded up metabolic rate take care of the excess and insure that he/she stays thin. Other people, with static metabolic rates, will put on pounds with any increased caloric intake.

In fact, you can take two different people, feed them exactly the same thing and put them in a chair all day and one could burn twice the number of calories or more of the other one. One could end up maintaining body weight while the other blew up like a blimp. While it may not seem fair, there's very little you can do to change it. These rates are genetically fixed. You're born with them.

Exercise is one of the few safe tools available to speed up a sluggish metabolism. Along with its other many health benefits, it also kick starts the metabolism and gets it working faster and burning off more calories. We'll supply an exercise program made to order for the Metabolic Diet later in this book. We'll also talk at length about nutritional supplements that can increase your metabolic rate and others that can aid in increasing those critical ATP stores we talked about earlier and provide energy for your exercise program and body shaping efforts.

Why Are We Overweight?

Along with the amount that you eat and metabolic rates, there are many other possible explanations for being overweight. The body's ability to produce heat in response to cold conditions or food intake is an important part of energy consumption. In some people diet induced thermogenesis, a process by which increased energy is burned off and released as heat rather than stored as fat, may be defective and contribute to obesity.[103]

There is evidence that a certain kind of body fat called brown adipose tissue (BAT) is an important site for heat production. It appears that BAT in obese people may be less active than that of thin people.[104] While the thin person can increase the heat production of their BAT to burn off increased calories, the obese person can't. A higher-fat diet has been shown to increase BAT-regulated diet-induced thermogenesis.[105]

Other researchers have looked at ATP, the body's powerful energy source, and indicated that there may be a deficiency in its production in the obese person.[106] Whatever the case, it's certain that most people don't become overweight because they're grossly overeating, lazy or lack character. In fact, many "fat" people don't eat more than those that are of a "normal" weight.

It's kind of a "good news/bad news" situation. On the one hand, the "good news" is that you can stop blaming yourself for your weight problem. The "bad news" is that you're probably being held back by genetic factors beyond your control and will have to take more personal responsibility and action than some other people do to get the body you want.

I know it's not fair, but there are two things you can do about it. You can sit around and sulk or you can do the necessary work to correct the situation. Results will be determined by the amount of effort you put out.

If you're going to give the Metabolic Diet your maximum effort, you'll be taking a three-step approach. The diet itself -through the "metabolic shift" of changing the body over to a fat-burning machine instead of a carbohydrate-burning, fat-producing one - will melt away the body fat and give you the basics for creating a fit attractive body. Exercise will give you a leg up on the body shaping that will make you look your best while providing for good cardiovascular health and protection from heart disease. Supplements will give you that extra edge to help get the absolute best out of the diet and training and create a sensational body.

These three tools used together - the Metabolic Diet, a solid exercise program and a savvy approach to nutritional supplements - provide a "can't miss" scenario for success. And to think it all occurs without the starvation and insanity that comes with the carb-based diets.

Getting Started

Before going on the Metabolic Diet you should get a complete physical from your doctor. You should also have some blood workup including a complete blood count, cholesterol levels (total, LDL, and HDL), TSH (a test for thyroid function), fasting blood sugar, serum uric acid, serum potassium, liver function array and BUN. Your doctor may want to go beyond this, but he'll let you know if you should have more done.

As far as the cholesterol issue, because you're burning fat for energy, much of the cholesterol and saturated fats that could cause a problem are used up in the process. Studies have even shown that along with increasing the utilization of fat as an energy source and providing for weight loss, the Metabolic Diet can even reduce serum cholesterol.[107]

In my patients, I've consistently found a reduction in serum cholesterol and an improvement in the cholesterol and triglyceride profile on patients who are on the Metabolic Diet and are losing or have lost weight.

A typical example is one patient who has been on the diet for two years. The table below outlines the changes in his lipid profile before he started the diet and after being on the diet for two years. During this time he has lost over thirty pounds while increasing his muscle mass, and presently weighs a muscular and fit 200 lbs.

	Nov-96	Normal	Nov-98	Normal	Comments
Total Cholesterol	236	160-240	220	175-260	Total Cholesterol Is Down
HDL	22	31-59	64	32-60	Good Cholesterol Is Up
LDL	191	90-171	141	104-179	Bad Cholesterol Is Down
Cholesterol/HDL	10.7	<5	3.4	<5	Total Chol. To HDL Is Down
LDL/HDL	8.7	1.52-5.52	2.21	1.73-5.59	Ratio of LDL To HDL Is Down
Triglycerides	123	10-150	72	10-150	Triglycerides Are Down

As you can see his lipid profile improved dramatically while on the higher-fat/lower-carb diet. His lipid profile taken two years ago would have put him in the high-risk category for coronary artery disease while the recent lipid profile puts him in the very low risk category in all the parameters presently used to assess this risk. In this case, the patient was not all that careful in the type of fats he ate and did not take any oil supplements. He relied heavily on red meat. While some improvement would be expected from the weight loss and exercise, it's obvious that being on the Metabolic Diet didn't adversely affect his lipid profile.

On the other hand, it never hurts to keep track on your cholesterol level whenever you change diets and even more so if you have or have a tendency toward a cholesterol problem. Cholesterol levels are largely determined by individual metabolism and body chemistry, and genetics play a strong role. If you've had cholesterol problems in your family there's a good chance you may be predisposed.

If you have a chronic problem with cholesterol you need to talk to your doctor about how this may be affected by the Metabolic Diet, and what you can do to limit any adverse affects. Frequent monitoring of your lipid status will let you know where you stand and if changes need to be made.

There are a number of adjustments you can make to the Metabolic Diet to control your cholesterol intake if needed. Marine oils, flaxseed oil, olive oil and other nutritional supplements will help. Meat restriction may also be necessary. But, again, this is something you need to work on with your physician. If the Metabolic Diet seems like the answer to you, you'll have to put your heads together to devise a plan where you can benefit from the weight loss and toning advantages the diet provides while keeping cholesterol in check.

Along with getting the physical and blood work we also urge you to weigh yourself and get a body fat analysis before you begin the diet. Scale weight loss is important but so are inches. You should understand that there are times when, for a variety of reasons, you might not be losing much scale weight, but you're subtracting that unsightly body fat. It will help keep your enthusiasm high in these moments if you know that progress is being made in other areas and your body is toning up. I've devised the Metabolic Index™ to help you keep track of your progress. By plugging in your weight, height and body fat level, you'll get a good idea of whether or not you're losing body fat regardless of the changes in body weight.

In addition to keeping track of your Metabolic Index, you might also want to keep track of your body measurements. Especially important are your waist, hips, upper thigh, chest and upper arm. These measurements will give you an idea of how your body is responding to the diet and where you're losing weight the fastest. It will also give you an idea of where your problem areas may be and where you may have to concentrate exercise to get the body you want.

Secondly, measurements will be helpful for motivation when you're retaining fluid or not losing weight for some other reason and will complement the Metabolic Index. If you see those waist and hip measurements going down, despite the lack of weight loss, it'll show you, along with the changes you'll see in the Metabolic Index, that you're making progress. Finally, you should review the use of any medications you may be on. If you're on diuretics, you may want to use them only as needed due to the higher-fat/lower-carb diet's ability to help you shed water.

Most type 1 and type 2 diabetics will usually have to adjust their insulin or oral diabetic agents, perhaps decreasing them during the low-carb portion of the diet, and going back to their normal dosages on weekends. You should check your glucose levels at various stages of the diet until you become familiar with the effect of the diet on blood glucose. It's important to check with your doctor and keep checking as you continue the diet and lose weight so that you are aware of your status and can make changes where needed.

Chapter 4: The Diet

The Diet

You can start the Metabolic Diet from two very different starting points. You can hunker down and bite the bullet or you can ease into it. The reason I've set it up this way is to allow anyone starting the diet to approach it from either the original strict approach or from a more conventional approach. In the end it really doesn't matter where you start since the purpose of the Metabolic Diet is to find your unique optimal dietary carb level.

For those who have that built-in confidence and feel that it's better to jump in rather than ease in, they can start with the strict Low-Carb Assessment Phase. This phase lasts anywhere from two to several weeks and allows you to determine if you're an efficient fat user and as such can do quite nicely without too many carbs. If that's true, then you're all set to carry on with the low-carb five-day, two-day phase shift regimen.

For those who, for one reason or another, are still too carb conscious to go on the strict low-carb diet, we have an alternative way to get on the Metabolic Diet bandwagon. These people can start by going on the Moderate-Carb Phase of the Metabolic Diet. This phase starts off at about the 20-25 percent dietary carb level and as such gives people a mid point from which they can determine just how many carbs they need to function optimally.

Either way, by carefully monitoring how your body reacts to the carb level you're on and then making any necessary adjustments in carb intake, you'll eventually arrive at that magic dietary carb level that's just right for you. It's important to realize that the Metabolic Diet is not a static process but a dynamic progression in which you have to be actively involved in order for it to work. If you take an interactive part in the process you'll discover enough about yourself and your metabolism to achieve your fondest body weight and fat loss goals.

The Assessment Phase Of The Metabolic Diet

The initial part of the Metabolic Diet in which we determine just how your body functions under carb deprivation, is meant to be a testing ground for a person's capability for utilizing fat as a primary fuel. Those who are efficient fat oxidizers will do very well in this phase of the diet. Those who aren't may find that they won't be able to cope as well on this strict part of the diet and will do much better as the carb levels are raised in subsequent weeks.

This Assessment Phase of the Metabolic Diet can be anywhere from two to six weeks. It all depends on your level of comfort or for that matter discomfort. The Metabolic Diet is designed to be a phase-shift diet. That is, the weekdays are lower-carb, while the weekend is higher-carb.

However, that's not the way it works in the first two weeks. The best way by far to approach the first two weeks is to stay low-carb for the first 12 days and then carb up on Saturday and/or Sunday. Doing it this way will give your body the incentive to make the shift from burning carbs to burning fat as its primary fuel. It will also tell you very quickly if you're totally unsuited for bottom level low-carbing.

Guidelines For The Assessment Phase

Although it's best to stay on this schedule for the first two weeks, it's not written in stone. If you're just not able to cope there's room in this diet even in the assessment phase of the diet, to increase the level of carbs in your diet. In fact, you can use the guidelines below for increasing dietary carbs after the first week of trying the diet.

Assessment Phase

The basic Assessment Phase of the Metabolic Diet is really quite simple. It calls for a dedicated higher-fat/high-protein/low-carb diet from Monday all the way through to the following Friday (a total of 12 days) before carbing up.

The Number of Grams of Carbs Allowed and the Percentage of Calories to Come From Fat, Protein and Carbs.

	Carbohydrate Intake	% Fat	% Protein	% Carbs
Weekday Maximum	**30 Grams**	**40 - 60%**	**40 - 50%**	**4 - 10%**
Weekend (36-48 Hour Carb Load)	**No Real Limit**	**20 - 40%**	**15 - 30%**	**35 - 60%**

During that time, except for those who are exceptionally uncomfortable (fatigue, weakness, etc.), you'll be limited to 30 grams of carbohydrates maximum per day. Fat should be set at roughly 50-60 percent and protein set at 30-40 percent. Follow this criteria during the initial 12-day phase of the diet and for the ensuing 5 weekdays of the following weeks, assuming you're biochemically suited to this low level of carbs.

Then, come the second Saturday and subsequent Saturdays, you perform the big turnaround. You go through a higher-carb phase of the diet and do the big carb up anywhere from 12 to 48 hours over the weekend and following weekends.

Guidelines For The Assessment Phase

- **50-60 % Fat**
- **30-40 % Protein**
- **30grams Carbohydrates**

On the weekends you can set your fat intake at 25-40 percent, your protein intake at 15-30 percent and carb intake at 35-55 percent. As we will see further, these levels should be adjusted to match and maximize individual body chemistry and needs.

The whole process is very similar to what athletes call "carbohydrate loading". You hit the carbs relatively heavily and this allows you to be very sociable in the dietary sense. You can eat those foods you've been missing during the week.

Basically what we're doing here in the Assessment Phase is limiting carbs during the first two weeks. Then, all of a sudden, the second weekend hits and you're stuffing yourself with carbohydrates.

Guidelines For The Carb-Loading Period

- **25-40 % Fat**
- **15-30 % Protein**
- **35-55 % Carbs**

Insulin levels will rise dramatically. In fact, it's been shown that the higher-fat/low-carb diet phase of the diet makes the insulin response to the high-carbs even greater than it normally would be.[108,109]

The first thing your body does in response to this exaggerated carb loading is stuff the muscles with glycogen and begins to firm up. This is the portion of the diet that insures you'll have an attractive foundation and not just a softened shell to shape when all that fat comes off. You'll find yourself rather relaxed during this period because all those carbs will be raising serotonin in your body.

But once you get back into your regular routine Monday you'll quickly find yourself energized and ready to take on the world. If you're exercising, as you should be, you'll find yourself feeling especially upbeat, healthy and motivated.

During both Monday and Tuesday your system will be working hard, burning off all the increased glycogen that you've gained over the weekend, and continuing to burn fatty acids. Overall you'll experience a rise in fat burning and body shaping potential. Then, Wednesday to Friday, with glycogen limited again you'll depend much more on your primary fat-burning metabolism to maximize fat loss and body toning.

Needless to say, your body goes through a big transition weekly with this diet, whether or not you stick to the assessment protocol or increase your dietary carbs to a level where you function best. That's why it's important to know when to stop on the weekend. If you find that you have an unlimited appetite on the weekend, that's OK. You'll kick the insulin into gear that much faster. But you must be careful. Some people will have a tendency to begin laying down body fat faster than others.

That's why you have to be aware of the point at which you begin to feel puffy and bloated. This point will vary greatly from person to person. Some people will feel hardly any response in appetite from the increased insulin. Others, however, will experience wide insulin swings and find themselves hungry and eating all the time.

That's why I list 12-48 hours as the carb load on the weekends. This could be cut back to even less than 12 hours for people whose appetites become insatiable or for people who tend to begin laying down body fat relatively early in the carb loading phase. The important thing is knowing when you've had enough. When you start feeling puffy and bloated and detect fat being laid down, it's time to go back to your weekday high-fat/low-carb routine.

Granted, it may take you awhile to learn to know your body and realize when it's telling you it's time to change phases. This point will vary widely from person to person and, while it may be easy for one person to interpret body cues, it may be harder for another. If you're having trouble with this, make the change earlier in the weekend and see how you look and feel the next week. As always, patience is the order of the day. Experience will eventually teach you to interpret your body signs and know when you're putting on fat.

Also, keep in mind that the percentages listed in the boxes for fat, protein and carb consumption are optimal numbers. If you've never done any real diet planning before, you may have a bit of trouble reaching them at first. If so, don't worry. By shooting for the 30-gram carbohydrate limitation and 40% minimum fat level in the diet during the early weeks, you'll make the "metabolic shift" necessary for initial success.

The First Month

In fact, we don't want you making a lot of changes in your diet in the early weeks. Any diet, even the assessment part of the Metabolic Diet, is going to be hard enough to adapt to. So don't drastically change the amount of calories you're eating. Don't get into some serious body shaping regimen or otherwise make it hard on yourself. In these first weeks, simply concentrate on picking a calorie level you'd like to work at and then getting used to replacing the carbohydrates you eat with fat and protein.

If you're having trouble determining if you're at the initial 40% minimum fat level (the level of fat in the usual North American diet), focus your diet on meat dishes. This should insure that you're getting enough fat. Above all, the most important thing in the early days of the diet is to determine if you can make the "metabolic shift" to become a fat-burning machine. Don't do anything fancy until you've gone through the shift.

To insure that you go through the "metabolic shift" as quickly and efficiently as possible, do not carb load during the first weekend. If you can, continue the higher-fat/lower-carb phase during that time.

Let me repeat this because it's important. I want you to begin the higher-fat/lower-carb phase of the diet on a Monday. Then continue that phase, if you can, all the way through the first weekend and second week. On the second Saturday following the beginning of the diet, you'll do your first carb loading. By beginning the diet with 12 days of high-fat/low-carb consumption, the metabolic shift will occur quickly, and with certainty, in those who are or can become efficient fat oxidizers.

Hypothetically, some dieters may decide to begin the diet on Wednesday and then immediately begin carb loading two days later. This isn't close to enough time to make the metabolic shift. Don't do it.

If you go the first 12 days on the higher-fat/low-carb cycle before performing a carbohydrate load you'll be fine. It may be a little difficult, but it will get the job done. Doing it this way will ensure that the Assessment Phase accurately assesses whether or not you can function efficiently on dramatically reduced carbs.

How And When To Increase Dietary Carbohydrates

I've found it usually takes about three to four weeks on the phase shift part of the Metabolic Diet to see if we can survive and thrive on this low level of dietary carbs, or if we need more carbs throughout or just at one time or another. However, for the sake of assessing whether or not the strict Metabolic Diet suits you, I decided to do it two weeks at a time. If, after the first two weeks you feel OK, then you merely carry on with the 5+ days at 30 grams and 1-2 days in the higher-carb phase.

If you're mildly to moderately tired and otherwise affected, make sure that potassium and other minerals aren’t the problem (see section on potassium later on in this chapter), then go through another two-week assessment phase to see if things even out. If you're severely affected then go on to one of the variation diets where you selectively take in more carbs depending on when you're feeling fatigued.

If you feel good from Saturday to Wednesday and start to get tired by the time Thursday rolls around, then a Wednesday carb-spike day should do the trick. So on Wednesday you should increase your carbs to at least 100 grams and usually more. You might try incorporating between 0.5 to 1 gram per pound of bodyweight of carbohydrates and see how you respond.

If you're OK most of the time but just don't have enough energy for your workouts, then you might try taking in 30 grams of carbs, an hour before and after your training. The 30-gram increase is not written in stone. You can actually vary the amount of carbs you use before and after exercise by using anywhere from 10 to 100 grams and see what works for you. The type of carbohydrate you use also makes a difference in this case. For various reasons I've found that the use of a combination of high glycemic and low glycemic carbs works best at both times.

If you're tired and feel bad for most of the low-carb weekdays then we can try and double the carb intake to 60 grams per day on the weekdays to see if this helps. If that doesn't help we then increase the carb intake by 30 grams per day once a week for as many weeks as it takes for you to feel normal and function optimally.

Most people who have to increase their daily carbs usually level off between 100 and 200 grams per day. I've found that about one-half to one gram of dietary carbs per pound bodyweight per day is the norm for those who are relatively poor fat oxidizers. In a small number of cases it may be necessary to work up to as much as 3 grams of carbs per pound of body weight, depending on the individual and the activity that he or she is involved in.

When you have to increase the level of carbs in your diet it will take a while before you discover what your carb set point is. I've found that it takes people about two months on the average to find their ideal dietary carb level. Once you discover your Metabolic Set Point, you can fix your diet at that level for several months while you work on changing your body composition.

Starting With The Moderate Carb Phase Of The Metabolic Diet

While it's probably best to start the Assessment Phase of the Metabolic Diet right away, there's another way to begin experimenting and find your carbohydrate set point. I would start with this phase of the Metabolic Diet if you're not sure that you want to try the Low-Carb Assessment Phase or if your doctor, dietician, trainer or coach prefers you to try a more conservative approach.

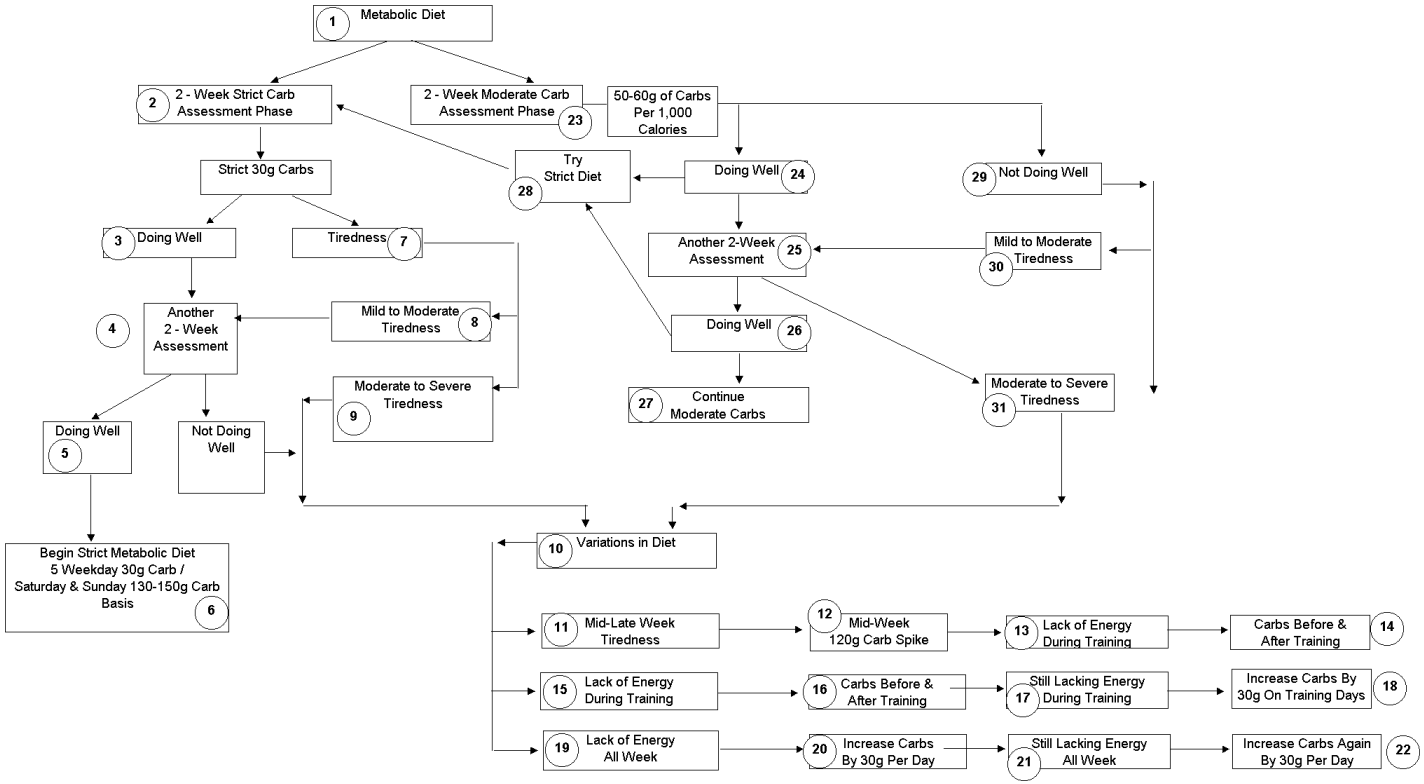
In the Moderate-Carb Phase, your carb content is limited to about 15 to 25 percent of your diet. So, if you were on a 2,000-calorie diet you would take in roughly 75 to 125 grams of carbs per day. The reason I say “roughly” is because I like to vary the carb intake day-by-day to give you an idea of how you feel on some low-carb days.

After the first 12 days you then increase your carbs over the weekend. Again, the increase can be anywhere from 50 to in some cases as much as 200 percent. Again, if you're comfortable with this moderate carb intake you can simply carry on in subsequent weeks using the 5-day lower-carb and weekend higher-carb regimen.

You can also give the Assessment Phase a try at this or any subsequent point. If you decide to see how you would fare under a low-carb diet then you simply start on the Assessment Phase of the Metabolic Diet. On the other hand, if you have some symptoms secondary to the lower-carb levels then you will have to try adding more carbs to your diet much the same way as under the Assessment Phase. The best way to visualize the steps that could be taken is to look at the following trouble shooting flowchart and the accompanying explanations.

Chapter 4: Flowchart Overview Of The Metabolic Diet

Steps to take in determining your carbohydrate set point.



The Metabolic Diet

1. This is your starting point with two decisions to make:
   (a) would I like to try the Strict Metabolic Diet, or
   (b) would I like to start on a Moderate-Carb Metabolic Diet.

2. I'm starting on a 2-Week Assessment Phase of the Strict Metabolic Diet to see how well I do on the 30g Carb Weekday, 130-150g Carb Weekends.

3. I've been following the 30g Carb Weekday, 130-150g Carb Weekends for 2 weeks now and I'm doing well. What do I do now?

4. Continue with a further 2-Week Assessment Phase of the Strict Metabolic Diet to see how well you do.

5. It's now been four weeks on the Strict Metabolic Diet Assessment Phase and I feel great. What do I do now?

6. Now your Strict Metabolic Diet begins in earnest so stay on the 5 weekday @ 30g Carbs and 2 Weekend @ 130-150g Carbs.

7. I'm feeling tired and I need some help with the carbohydrate part of my diet.

8. I only have low to moderate tiredness at this time so I will do another 2-week Assessment Phase to see how well I do.

9. I have moderate to severe tiredness so I need to introduce "Variations In Diet" to overcome this tiredness.

10. I'm at the "Variations In Diet" junction and need to review my options to combat this tiredness.

11. I have 'Mid- to Lat- Week' tiredness, so what do I need to do?

12. Try a 'Mid-Week Carb Spike' of an additional 120g of carbs just on Wednesday and see how well you do.

13. I did the 'Mid-Week Carb Spike' but now I lack energy during training. What should I do?

14. You need to take 30g of carbs, half an hour before training and 30g of carbs, half an hour after training to combat this lack of energy on training days.

15. I suffer from a lack of energy during training, so what do I need to do?

16. You need to take 30g of carbs, half an hour before training and 30g of carbs, half an hour after training to combat this lack of energy on training days.

17. I'm still lacking energy during training, so what can I do?

18. Increase your carbohydrate intake on training days by 30g again and every week until you feel normal during your workouts.

19. I lack energy all week so what can I do?

20. You will need to increase your daily intake of carbs by 30 grams.

21. I increased my daily carbohydrate intake by 30g for a 1-week period and I still feel tired all week. So what can I do next?

22. Add another 30g of carbs to your daily intake for a 1-Week Assessment and again every week until you feel normal.

23. I'm starting a 2-Week Assessment Phase of the Moderate-Carb Metabolic Diet to see how well I do. This is where my carbohydrate intake is 50-60g for every 1,000 Calories of my particular diet.

24. I've completed the 2-Week Assessment Phase of the Moderate-Carb Metabolic Diet and I'm doing well. What should I do now?

25. Continue on the Moderate-Carb Metabolic Diet for a further 2-Week of Assessment.

26. I've completed the additional 2-week Moderate-Carb Metabolic Diet Assessment and I'm doing well. What do I do now?

27. Now your Moderate-Carb Metabolic Diet begins in earnest. You will be consuming 50-60 grams of carbs for every 1,000 Calories of your Diet.

28. Alternatively, you may wish to try the Strict Metabolic Diet after doing so well on the Moderate-Carb Metabolic Diet.

29. I've been on the 2-Week Assessment Phase of the Moderate-Carb Metabolic Diet and I feel that I'm not doing well. Here is my tiredness level.

30. I feel 'Mild to Moderate' tiredness after the 2-Week Assessment Phase of the Moderate-Carb Metabolic Diet. I will continue on the Moderate Carb Metabolic Diet for a further 2-Week of Assessment.

31. I feel 'Moderate to Severe' tiredness after the 2-Week Assessment Phase of the Moderate-Carb Metabolic Diet so I need to introduce "Variations In Diet" to overcome this tiredness.

What To Eat

During the weekdays, there are plenty of options for high-fat/high-protein/low-carb foods available. Virtually any meat is OK, and most of you will focus on steak, hamburger, pork and other red meats on the diet. In addition, venison, fish (of great importance as we'll see later), lamb, shrimp, lobster, chicken, turkey, and other white meats are also OK. So are canned sardines, tuna, shrimp, herring and anchovies.

Almost any kind of cheese is fair game as well. Use the full fat and non-skimmed milk varieties. Keep in mind that cheese spreads, cottage and ricotta cheese are higher in carbohydrates. Brie, Camembert, Muenster, Gruyere and Monterey jack are very low in carbs and good for the diet.

Whole eggs are great. Deviled eggs can be a good snack food to keep in the refrigerator to use. Butter and most plant oils are fine. Nuts and seeds like walnuts and sunflower seeds are also good, but keep track of the carbs. So are condiments such as salt, vinegar, oil, and mayonnaise, although we urge you to use oil (especially olive oil) and vinegar dressing most of the time. Most other commercial salad dressings are in the vicinity of seven percent carbohydrates.

Sugar is going to be a problem for people with a sweet tooth. You can end up craving it, especially during the assessment phase of the diet. Look to appease any cravings along this line with low-carb drinks and desserts with artificial sweeteners. However, avoid sorbitol and fructose - remember, sugar-free doesn't necessarily mean carb- free. Make sure and check the labels. Diet soft drinks are fine.

You can also put sugar-free Jell-O (that uses an artificial sweetener) to good use. Topping it with carb-free whipped cream may be just what you're looking for to gain control. It has no carbs and many Metabolic Dieters have found it quite successful in appeasing any cravings. Just be sure to check the labels on whipping cream containers to make sure carbs haven't been added.

Another factor to consider is that, even if you have cravings, you're only putting off satisfying them until the weekend. Then you can eat basically anything. We're just partitioning or separating foods here. We're not saying you can't have lasagna. You just have to wait for the weekend. That's a lot better than other diets where you're basically stranded on Low-Fat or, in some cases, Low-Carb Island for the rest of your life.

This can also work for you psychologically. Foods you love can give you a goal. Just get to the weekend and you can have that slice of apple pie. You're giving yourself something to look forward to and it can even be fun. This doesn't present the kind of depression and boredom you get eating the same thing over and over, week after week, month after month. You don't have to come up with an elaborate set of recipes to keep yourself sane.

Chapter 4: What To Eat

When you get to the weekend, do what you want! Fill up the tank on the foods you want. Satisfy those cravings. Some people will go overboard at the beginning of the diet and eat until they're nearly sick. Most will overdo it to some degree, but this is fine. It gets easier as you go.

Once they've been on the diet awhile, most people won't have that strong desire for ice cream or onion rings anymore. They'll eat them but they won't pig out and, as they start adjusting their diets and dialing them in for maximum progress, they'll begin to see some real improvement and acquire some real knowledge about the way their body works and how adjustments can be made to achieve their goals.

Sample High-Fat/Low-Carb Foods You Can Eat On The Metabolic Diet

Steak Hamburger Sausage Venison Salmon Lamb Shrimp Lobster Chicken Turkey Tuna Herring Anchovies Cheese* Eggs Butter Oils** Walnuts Pot Roast Pastrami Bacon Mayonnaise Diet Soda Jell-O*** Sunflower Seeds

* Full-Fat/Low-Carb
** Poly and monounsaturated fats such as is found in nuts, olive oil, flax seed oil
*** Sugar-free

Artificial Foods And Sweeteners

Invariably, losing weight means going through some anguish. We can't eat as much as we would like and we can't eat some of our favorite foods. Besides that, we're all addicted to carbohydrates especially sugar. As a society we're carboholics. Rather than being carnivores, we've become carbovores. So we need our starch/sweet fix, but we don't need the calories. So, to deal with the battle of the bulge and thus "have our cake and eat it too," our food industry has come out with some novel "solutions."

The first solution was the introduction of artificial sweeteners. Since the average American consumes about 80 grams of sugar per day, theoretically, if we could replace all of this with artificial sweeteners, we could effortlessly decrease our daily calorie intake by over 300 calories. But if we don't succeed in decreasing our calorie intake in this way, it's not for the lack of trying. At present over 100 million Americans use sugar-free foods and beverages, mainly in an effort to control their weight.[110]

Nevertheless, it's possible that through various mechanisms, these food substitutes may actually cause people to gain weight. For example, some studies have shown that the use of saccharin can result in hyperphagia (uncontrolled eating) and can dramatically increase food intake, resulting in significant long-term weight gain.[111]

As well, the use of saccharin does not mimic the satiety seen after the use of calorie-containing sweeteners such as glucose.[112,113] Nor does it have any effects on insulin, as does regular food.[114] With aspartame (a sweetener that's composed of two amino acids), however, it is not as clear and you can find some substantiation for both weight loss and weight gain with its use.

The pros to using aspartame is that it contains the same number of calories as sugar, it's actually a protein (made up of two amino acids) and it's far sweeter so you don't have to use as much to sweeten foods. The cons are two-fold. If you're sensitive to phenylalanine, or have phenylketonuria (PKU), you shouldn't use aspartame. Also, aspartame has received some bad press from the small amount of methanol it contains. While this press is mostly sensationalistic there might be some grain of truth behind the claims being made against this sweetener. I must say, however, that over 30 years of research shows aspartame to be a safe and reliable alternative to sugar.

While the occasional use of saccharin and cyclamates is OK, try and avoid them since both have been linked to cancer in some research studies and cyclamates may also have mutagenic properties causing genetic damage.

There are a number of natural sweeteners that are becoming more popular and available, including sucralose (Splenda), xylitol and acesulfame K. While xylitol has some calories and is considered a carb, small amounts of it go a long way, especially if combined with sucralose and/or acesulfame K. For example, the blend of xylitol with sucralose and acesulfame K makes a synergistic blend of sweeteners that mimics the properties of sugar, leaves no after taste and has a negligible calorie and carbohydrate content.

Fat Substitutes

If substituting artificial sweeteners for sugar and starch doesn't necessarily work, then what about the fat substitutes? Can we fool the body with fake fat?

A study shows that it's hard to fool Mother Nature.[115] This study examined whether regulation of energy intake is affected when the nonabsorbable fat substitute olestra is used to uncouple the sensory properties of fat from fat absorption and metabolism (you eat it but your body can't absorb it so there's no calories). In other words, if it feels like fat but without the calories of fat, will the body compensate for the missing calories, or will there be a natural decrease in the daily caloric intake? No such luck.

The results of this study showed that the olestra did nothing to curb the daily caloric intake of a normal diet. In other words, those using olestra increased the intake of other foods to make up for the missing calories. The authors concluded that the 'feel' of fat didn't fool the body and did not affect energy regulation.

Unfortunately, the marketing of olestra hasn't been concentrating on what's really important here. In the past year most studies concentrated on the possible gastrointestinal side effects (reports of diarrhea were rampant in the popular press) and the effect of olestra on the absorption of fat-soluble vitamins. The studies have shown that in large amounts olestra causes significant amount of gastrointestinal distress[116] but doesn't in smaller amounts.[117] They also show that you need to increase your intake of vitamins A and D when using significant amounts of foods containing olestra.[118]

What can we take away from these results? First of all, don't depend on artificial sweeteners or fat substitutes to either help you lose weight or to maintain weight loss. It may or may not work. It seems that the body doesn't respond well to taste without calories. You see, taste was supposed to mean nutrition. Separate the two and the body compensates by increasing your appetite so that you're forced to take in the nutrients your body thinks it needs.

A Word About Salt

Although salt is fine on this diet, you should use it with some caution. People will often overdo salt in an attempt to compensate for foods they aren't allowed. This can have serious consequences.

People with a history of, or who have, high blood pressure or heart disease should stay away from the saltshaker. The salt added by a cook or even the natural salt you'll find in many foods on the Metabolic Diet should be enough for you. Likewise, women who are prone to fluid retention, bloating or PMS should stay away from too much salt.

If you do cut back on salt, you may find food tasting bland for a while, but you'll be surprised how fast your taste buds will adjust to the change. You'll also be surprised how much better food will taste when you don't engulf it with a layer of salt and let the natural flavor come through.

If you're going to be on guard for salt, be aware that many commercial foods that you might not suspect contain a high level of it. Certain juices (orange juice has much more salt than grapefruit juice), pickles, sauerkraut, canned vegetables, canned fish, diet soda, frozen dinners, ketchup, canned soup, self-rising flours, cured meats, corned beef, olives, baking powder, bouillon cubes, and cheeses contain various amounts of salt.

Though some of these foods are staples of the Metabolic Diet and are OK for most people, those with a salt problem should keep an eye on them to insure no overload develops.

Watching What You Eat

When on the higher-fat/low-carb portion of the diet, we urge you to look for some variety in the foods you eat during the day. You'll be eating plenty of meat, but look for opportunities to supplement it with other foods. In Chapter 6 we'll talk in depth about the difference between "good fats" and "bad fats" and about the importance of fish in your diet. Adding fish and other healthy foods to your diet will not only provide a necessary dietary balance but also make the diet more interesting and effective.

You will, however, find yourself favoring some foods over others, and this is all part of the learning experience you'll go through on this diet. Some people have found themselves focusing on salami and spicier pork products at the beginning of the diet, only to find their preference moving to steak later on. They found themselves feeling better as a result, and some chalk it up to the decrease in sodium involved in the change, others to less preservatives and chemicals. Others have started with a lot of hamburger in the diet and also moved over to steak and found themselves feeling better.

This preference for steak seems common with many on this diet. They claim to feel better and experience better results with steak as their primary meat, but again this is up to the individual. There are many whose primary protein and fat sources are other beef cuts and parts (such as liver), pork, lamb, eggs, cheese and fish. It's all in what you prefer and how you react to the various foods. You'll have to feel your way through the diet to see what's best for you. As always, look for alternatives and variety where possible.

No matter what kind of foods you prefer, make sure that what you get is fresh and untainted, and then keep it that way until you eat it. Handle food as little as possible and keep food refrigerated. The saying "buy food that spoils, but eat it before it spoils," is good advice. Food that keeps too long is unnatural and likely has been chemically treated or refined to make it last longer. In buying red meats, chicken, fish, or dairy products use your eyes and nose to tell you if it's fresh or if it's beginning to spoil. If it doesn't look and/or smell just right, chances are it isn't.

It's always a good idea to choose meats and other foods that come from sources that have had a minimum of exposure to chemical and hormonal manipulation. For example, the least contaminated fish comes from deep waters that are a good distance away from populated and industrial areas.

Thus, it's safer to eat fish caught in the mid North Atlantic than the more polluted fish caught along the North Atlantic Coast where major sites of marine contamination are Boston, New Bedford, Providence, New York, Baltimore Harbor, and the Elizabeth River, Virginia. Analyses in these and other areas show increased burdens of many contaminants, including polychlorinated biphenyls (PCBs), pesticides, phthalates, metals and aromatic hydrocarbons.[119]

Chapter 4: Watching What You Eat

Those who are worried about the contamination of our food by heavy metals, such as mercury, pesticides, herbicides and other chemicals, are buying their food from organic sources. Foods grown organically are not treated with artificial fertilizer, pesticides, herbicides or hormones and, although far from being free of them, generally have lower levels of these contaminants.

When To Eat

With the Metabolic Diet, when it's time to eat, it's time to eat. There are no set times. You eat when you're hungry. Some people on the diet will find themselves eating three meals a day and supplementing this with snacks as needed. Occasional folks will sit down 5-6 times a day for a more formal meal. It's up to the individual, his/her schedule and appetite. But you have to eat when you need to. On the other hand, one of the biggest mistakes you can make with this diet when you're first starting out is skipping a meal. You'll miss one, get very hungry, blame it on the diet and suddenly make an emotional, foolish decision about dropping the diet. At the beginning of the diet, for the first 3-4 weeks, you've got to be very regimented about eating. That's reflected in the sample diets in Appendix 7.

On the other hand, have you ever noticed how children will eat at "odd" times? Unlike adults, who eat say at 7 a.m., noon and 6:00 p.m. every day whether they need to or not, children eat when they feel they need to. They may leave their plate full at lunch and be rummaging through the refrigerator two hours later. It's more natural to eat when you are hungry. That's the way many people have found this diet to work best. We all have an instinctive voice that will tell us when to eat, and this voice can become very insistent. Listen to it and do what it says. You should try not to go longer than three hours without putting some calories in your body.

Keep in mind that your metabolic rate is lowest in the morning and rises gradually during the day until early evening. At that time, it begins to fall gradually until early morning. Your metabolic rate is highest between 4:00 to 8:00 pm. Eating with this in mind can aid you in best burning calories, but don't be misled. If you eat in the early evening, your body may still be metabolizing food when it begins to slow down and be far less efficient in burning calories.

Also, when it comes to exercise, you should try not to eat 45-60 minutes before you begin a workout. You want all your energy devoted to training, not digesting food. This also maximizes GH release during your workout. Many athletes train in the morning before breakfast, and there's really no problem with this. The body's energy reserves are thus devoted to the exercise at hand and breakfast is put off until after exercising, when hormonal levels are better suited for using the food you eat for rebuilding muscle and decreasing body fat. Although you shouldn't eat whole foods just prior to training, some supplements can be used to enhance the anabolic effect of exercise. We'll elaborate on these later when we discuss supplements.

When To Eat Your Carbs

A real question that comes into play on the higher-fat/low-carb portion of the Metabolic Diet is when to eat your carbs during the day. Some people spread them out; others get most of them in one meal. Again, the answer has to do with personal preference. You can eat your carbs at any time of day and it won't matter, as long as you don't go above the 30-gram carb limit.

But some people find eating their carbs throughout the day, even though the amount is limited, makes them hungrier, lazier, and sluggish. They get that "turkey dinner syndrome" when they finish and all they feel like doing is laying on the couch. This isn't good, especially for a busy person who needs to feel motivated and energized during the day.

Many people believe that our eating patterns have become counterproductive in modern society. The average American eats a lot of carbs during the day and the insulin and serotonin responses we talked about earlier can become very pronounced. At times of the day when we need to be productive and alert, in the early afternoon for instance, we'll be sleepy and lethargic from all those carbs and the resulting hormone and neurotransmitter rush.

Wouldn't it be better to save the carbs for later in the day? That's what many people do on the Metabolic Diet. They'll keep the carbs minimum during the day and find their energy levels much increased as a result. Then they'll come home at night and have the bulk of their carbs with dinner. The carbs at dinner will find them unwinding in the evening hours, relaxing and sleeping like a baby at night.

It's interesting to note that one of the trends in business today is toward a more streamlined lunch. Those huge, three-martini lunches are no longer the norm. Executives and employees are eating and drinking more sensibly in the middle of the day and finding productivity rising as a result. This comes not only from time saved at lunch but also from the improved attitude that comes with getting rid of all those carbs and alcohol at noon.

Another good time to take your carbs is after exercising. For a few hours after exercise there is a window of opportunity when hormonal factors are just right for rebuilding muscle. Taking carbohydrates during this time period spikes insulin levels and increases protein synthesis thus maximizing the effects exercise has on strengthening and toning your body.

A few carboholics who are on my diet reserve their carbs for the evening. They eat almost no carbs during the day so they can have their 30 or so grams at night in the form of ice cream or a chocolate bar. That's OK as long as you don't go over your daily carb quota.

Chapter 4: When To Eat Your Carbs

Experiment

Personal experience and individual body chemistry will have a great deal to do with how you structure the diet. Different people will have differing responses to the carb-loading portion of the diet. The length of that carb-loading period may vary greatly as a result.

Even in the assessment/strict phase of the Metabolic Diet, the 30-gram carbohydrate limit is also not written in stone. It serves as a good guide and should be adhered to when beginning the diet, but some people may find that they can later increase carb intake to as high as 50 grams per day and still do fine. Others may find that anything over 20 will make them feel sluggish. Once you've made the "metabolic shift" and made the diet a part of your life, you can experiment to find what works best for you. The same applies for the moderate-carb phase. The idea is to find the levels of carbs that works best for you.

Fat levels may also be experimented with to some degree. Some may find optimum results going as low as 30 percent fat on the diet, but you must beware. You can't go too low. One recent patient recounted a story of how he'd been on a conventional low-fat diet and went to an all-protein diet. He began doing the egg whites, boiled chicken breasts and canned tuna in water thing and, while he ended up losing fat, his body shriveled up. He looked awful. The fact is that your body will burn fat as it's given to it; so don't worry too much about your overall fat percentages. You can make some adjustments, but be careful. If you don't give the body enough fat your body will lose its shape, which is exactly what you don't want.

The same principle is involved during the carb-loading phase of the diet. You still need some fat. If you don't give it fat, protein will get eaten up as energy. You also have to remember that the body will try to transform any excess calories available to storage fat and limit the use of body fat if you limit fat. It basically says, "I'm not going to get rid of this stuff because I may need it down the road." Limit fat in your diet and your body wants to lay it on as a way of keeping it around. You end up cutting dietary fat but adding body fat.[120]

This may sound like nonsense, but it's not. Give the body fat and it will use that fat and burn off body fat. When you're in a dieting mode, the more fat you give it, the freer it will be with enzymes for fat breakdown, and the more body fat you'll lose. You basically lose fat by eating it as long as you control your carb intake.

One of the good things about this diet is that you don't have to become paranoid and keep elaborate charts to get that proper amount of fat in your diet. In fact, if you're diligent about eating your red meat and other animal food (bacon, ham, steak, burger, fish, etc.), and in using olive oil, you shouldn't have to worry about hitting the 40-60% fat and 40-50% protein ratios. It will naturally happen.

Again, it's important to realize that individual experimentation will play a large role in aspects of the Metabolic Diet. The diet should be varied to provide the optimum level of performance and success for the individual. We're all different to some degree according to body chemistry and needs. No two human beings are alike. No two human beings will implement this diet entirely alike, either. As you make the diet a part of your daily lifestyle, experiment with it to find the best way to execute the diet for you.

Endurance Effects

Again, there's been a lot of criticism of higher-fat/low-carb diets from people who claim that you lose endurance and have difficulty exercising on it. In reality, the exact opposite is true.

First off, it's clear that carbohydrate has been vastly overrated while fat has been vastly underrated for their endurance capabilities. For example, intramuscular lipolysis (the breakdown of fat present in muscle fibers) in normal-fasted humans plays a much larger role in fuel metabolism than is generally believed.[121] As well, it has recently been shown that short-term, high-intensity exercise performance is not impaired by low intramuscular glycogen.[122]

Fat is important for endurance. One recent study showed that decreasing free fatty acids and glycerol (a compound resulting from the hydrolysis of fats and oils) in the blood can reduce fat availability for exercise, place increased demands on carbohydrates and actually lessen endurance.[123] On the other hand, an increase in the amount of fat metabolized by the body during exercise has a glycogen-sparing effect and improves endurance.[124] As well, a diet high in fat and low in carbohydrates does not adversely affect exercise intensity and in many cases actually enhances it.

The effect of a higher-fat/low-carb diet on exercise intensity and endurance was highlighted in two recent studies. One study looked at the effect of a high-fat diet on six trained runners.[125] What they found was that endurance was not lower, but significantly higher in those runners who were on the high-fat diet as against those that were on the normal, or high-carbohydrate diet.

The second study looked at the effect of a high-fat diet on cyclists.[126] In this study trained cyclists were shown to have enhanced endurance during moderate intensity exercise following two weeks adaptation to a high-fat diet. Also, the high-fat, high-protein, low-carbohydrate diet didn't impair their ability to perform high intensity exercise.

Two studies also show the beneficial effects of a higher-fat diet on exercise and endurance. In one study[127] the authors found that endurance runners may not have consumed enough calories on a low-fat diet and that increased dietary fat increased

energy consumption. On the low-fat diet, essential fatty acids and some minerals (especially zinc) may have been low. The authors concluded that a low-fat diet could compromise health and performance.

In the second study[128] runners on the low-fat diet ate 19% fewer calories than on the medium- or high-fat diets. Endurance time increased from the low-fat to medium-fat diet by 14%. Subjects who increased dietary fat to 44% had higher plasma pyruvate (46%) and lower lactate levels (39%) after the endurance run. The authors concluded that runners on a low-fat diet consumed fewer calories and had reduced endurance performance than on a medium- or high-fat diet. They also concluded that a high-fat diet, providing sufficient total calories, did not compromise anaerobic power.

The results of these studies will be significant for those of you who choose to run, jog, or do any activity that requires endurance including any form or aerobic exercise, as a way of maximizing the Metabolic Diet's potential. You also have to keep in mind that the two main fuels for muscle activity are carbohydrate and fat. There is a very limited store of carbohydrate in the body. But fat is an entirely different proposition. The average man on the street and considered to be in shape has about 15 percent body fat. The average woman has about 25 percent. These are huge stores of energy in the body, and much more energy will be available from fat over the course of exercise than carbohydrates.

The only problem that may crop up revolves around the question of whether you've fully adapted to the higher-fat/low-carb diet. If you haven't been on it long enough to go through the "metabolic shift" we talk about, you may find the diet affecting endurance. But if you've gone through the "shift," endurance probably will not be affected and will likely be enhanced.[129]

The other side of the Metabolic Diet is that, even in its strict form, it's not an entirely restricted high-fat, low-carb regimen. With the carb loading on the weekends, we're allowing a huge amount of glycogen build-up that's utilized early the next week. We're getting the best of both the higher-fat/low-carb and high-carb worlds without their drawbacks. You're getting both glycogen build-up and fat burn-off, and thus maximizing both weight loss and body toning.

Starting Up

With any diet you'll usually experience some kind of side effects when you first begin as a result of the change in your dietary habits. The Metabolic Diet is no different. You may experience some diarrhea and feel a bit bloated as you change metabolisms. Just the change from all those carbs will be enough for you to handle at the beginning.

As a result, you should not be as concerned with the amount of calories you're eating when you begin the diet. You should be concentrate on making the metabolic shift and replacing carbohydrate foods with fat and protein. Don't even be concerned about your weight. What you should be doing is allowing your body its easiest path toward adapting to the diet.

However, before beginning the diet, you should have some rough idea of how many calories you're eating each day. This will give you a baseline from which you can subtract calories to provide for weight loss later as needed. It's also not a bad idea to keep a 2-3 day diary of what you're eating and then have someone who has some expertise in diets look at it. That way you'll get numbers and foods you can best work with and figure what you need precisely for maintenance.

It's a good idea to use a fiber supplement when you first start the diet. One of the results of the higher-fat/low-carb diet is that the bowels must re-adjust to all that meat. The fats can act as a stool softener, and you may experience some diarrhea. You'll need to firm them up with some fiber. Adequate dietary fiber can prevent constipation.

Most of the problems we've found with people initiating the diet fall in this area and their failure to take the fiber necessary to harden stools or push processed food through the lower digestive tract. Eating a variety of vegetables, instead of restricting yourself to the more starchy ones (such as potatoes, carrots and peas) provides several benefits besides the fiber and starch that make it to the colon.[130] Vegetables have been shown to be an important source of antioxidants and phytochemicals that have been shown to reduce certain diseases and to help keep us in optimal health. For example, a high intake of fruits and vegetables--in particular cruciferous and green leafy vegetables (preferred on the low-carb part of the Metabolic Diet) and citrus fruits and juice--significantly reduces the risk of ischemic stroke risk and certain cancers.

Cooked vegetables may be healthier than fresh since they may be a richer source of beta-carotene, lutein, lycopene, and other antioxidants than are raw vegetables. It appears that if you cook and mash vegetables it increases absorption of the relevant antioxidants. Studies have also shown that vegetable juices may be even better sources of these important antioxidants.[131]

As well, you could take a few tablespoons of bran every day. If the bowels are still irregular (anything but normal), then you should try using some of the readily obtainable bulk laxatives (they help both constipation and diarrhea) to best get through this period.

Psyllium seed husk fiber or psyllium hydrophilic mucilogs (Prodiem, Metamucil) are excellent choices for several reasons. First of all, although technically classified as a carbohydrate, psyllium is not absorbed and therefore doesn't count as a source of carbs or calories, unless carbs are added for taste and palatability (always check labeling for added carbs). Psyllium is non-addictive, not a drug and all natural. It's easy to take and readily available either in raw or more commercial forms. Finally, psyllium has the additional effect of lowering serum cholesterol.[132] The powdered forms are best since most people won't take the necessary number of pills needed to get the proper dose.

You will probably have to take the fiber supplement for the first month or two of the diet. By that time, your body will have fully adapted to it. In some cases, people may find it necessary or may want to continue fiber supplements on a long-term or permanent basis. If so, you can continue with fiber supplements as needed.

Some people have also found that taking a meal high in fiber in the middle of the day, like a Caesar salad, will do the trick. This will provide about 7.5 grams of carbs and, as long as you stick close to overall carb limits, it shouldn't present any problem, especially after you've been on the diet for a while.

The Sweet Tooth Society

Remember that refined carbs are hidden in almost everything you'll find on those supermarket shelves. Seasoning, ketchup, mustard, salad dressings, nuts, BBQ sauce, breaded or processed meats, gourmet coffee and sausages can all present a problem. These foods are renowned for hidden carbs, and you've got to check the label to make sure what you're getting on this diet.

Likewise, watch out in restaurants. They'll sometimes use a watery sugar on the vegetables that will wreak havoc. Our society has got a sweet tooth, and you're going to run into it at every turn during the weekdays. You'll have to be especially careful when first starting the diet until you get used to it and learn where the trouble spots may be.

Don't Mix Diets

The big temptation may be to mix diets combining aspects of both the high-carb and higher-fat diets and putting them together in your own personal Frankenstein stew. **Don't.** Many people will go on the higher-fat/lower-carb diet but try to be true to their old high-carb master. They'll eat meat but it's all skinless fish, chicken and turkey.

While these foods may be quite nutritious and beneficial, even when used in the higher-fat/low-carb diet, they can't replace good, old-fashioned red meat. There just isn't enough fat there, although it's somewhat better if the skins are included.

What you end up doing by taking on the turkey/chicken/fish holy trinity is going on a high-protein, low-carb, and low- to medium-fat diet. Along with being even harder to stay on than the Metabolic Diet weekday menu, this diet will severely limit your progress. You won't burn the fat like you should and you won't have the energy.

You need red meat. You need the fat and the nutrients it provides. Don't shortchange yourself by trying to avoid it in some misled effort to stay true to forces in society who have labeled meat some kind of monster.

The First Week Is The Toughest

In the first week of the diet you'll be going through the "metabolic shift" from being a carb and muscle-burning machine to that of a fat burner. It can be difficult and may take more than one week to really adjust.

Keys to Early Diet Success

- **Don't worry about calories**
- **Take a fiber supplement**
- **Watch for hidden carbs**
- **Don't mix diets**
- **The first week is the toughest-stick it out**

While some people will suffer few symptoms, others will be very affected. The bowel irregularities we discussed above will come into play. You'll also experience some fatigue and get foul or fruity smelling breath caused by an increase in the production of ketones, compounds that result from the initial steps of fat oxidation.

Emotionally, you could feel irritable and mentally foggy in the first week. You can also experience pre-flu like symptoms where you feel like "something's coming on" or you're "fighting something off." Energy can drop and you can feel frequently hungry. Don't be alarmed. Basically, your body is just going through a re-adjustment phase. It will soon pass.

Unfortunately, many people will experience these difficulties and give up on the diet. They try it for a couple days, don't feel good and conclude: "It doesn't work for me." They never break through the barrier to experience the "metabolic shift" and the increased energy and sense of well being it can bring. That's why we urge you to stick with it during the first week. Once you get through that first week, it's all smooth sailing. You'll start to feel better and the diet will be easier. You'll get to the point where you'll feel so good, the Metabolic Diet will seem like a revelation. You won't suffer those insulin ups and downs anymore and energy will return.

Chapter 4: Keys To Early Success

You'll feel strong and lean and, in most cases, you won't be tempted to go back to the old, inferior way of eating. But you've got to get through the first week to experience the benefits. Generally you'll continue with the "start-up" phase of the diet and not worry about calories or anything else until you've got all your energy back and have no other symptoms. This will usually take anywhere from two to four weeks, and you'll know when it's time. You'll be feeling very, very good.

On the other hand, if the tiredness continues and is severe there's no point on persevering. That's what the Metabolic Diet is all about - finding the optimal level of dietary carbs that works for you. So if you're feeling tired and worn out, then it's a good idea to introduce some extra carbs.

The best way is to go through the troubleshooting guide in this book and figure out the best way to introduce those extra carbs. Once you've settled on what works best for your metabolism, you can begin to zero in on that weight loss and body shaping you've been dreaming of.

A Guide To 'Getting Started' On The Metabolic Diet

- **Get a complete physical**
- **No carb-loading phase during the first 12 days and then carb loading that second weekend.**
- **End carb loading the moment you begin putting on fat**
- **If dietary percentages are a problem, keeping carbs below 30 grams and fat above 40% on weekdays will insure the "metabolic shift"**
- **Appease sugar cravings during the week with artificial sweeteners**
- **Add variety to the diet where possible**
- **Eat when hungry, not by the clock**
- **Don't make weekends "No-Fat"**
- **Experiment with foods to find what works for you**
- **Eats carbs near the end of the day as a treat, or eat them after exercising to maximize the effects of exercise**

I've provided sample 2-week diets to start you on the road of the Metabolic Diet in Appendix 7.

A Word About Potassium

In order to smooth the transition and minimize fatigue, I usually recommend that anyone going to the Assessment Phase look at their potassium intake. Potassium is an important mineral with 95% of the total body potassium is contained within cells and only about 2% in the extracellular fluid.

Since meals can sometimes contain relatively large amounts of potassium, it is important that the body be able to deal with extra potassium so as to not develop high serum potassium levels (hyperkalemia). As well, even small potassium losses could result in low serum potassium (hypokalemia) if the body was unable to compensate.

Potassium levels are maintained within a narrow range, largely through regulation by the kidneys. Normally, the kidneys are able to adjust the amount of potassium excreted rapidly, and precisely, to maintain normal blood potassium levels.

Potassium is lost in sweat and urine and is easily depleted, especially in those who are losing weight since water loss is prominent in the early stages of weight loss. Lack of potassium can cause fatigue, irritibility, lightheadedness, headaches, muscle cramps and heart palpitations.

Those on the Metabolic Diet who choose to start with, or try, the Assessment Phase, are at the highest risk for potassium depletion as they lose their initial water weight. For this reason, I recommend the intermittent use of potassium supplements or potassium salt (such as Morton's). Potassium supplements are available at health food stores and pharmacies in various forms, including potassium gluconate.

I usually recommend anywhere from 100 - 500 mg per day for one or two weeks at a time, usually at times times of greatest weight loss. Food such as red meat, and low-carb vegetables, such as bell peppers, brocolli, cabbage, spinach and zucchini, are also rich in potassium.

Other minerals that may help include calcium and magnesium. As well, a complex rehydration drink, such as Electrosol™, may be the way to go for some.

Chapter 5

Losing The Weight

Chapter 5: Measuring Your Progress

Measuring Your Progress

The basic mechanics of the Metabolic Diet don't change. Except in the beginning, it's always five days of higher-fat/lower-carb followed by a 12-48 hour higher-carb or carb-loading phase.

Once you've made the "metabolic shift" and are comfortable with the diet you'll begin adjusting the calories you're eating to achieve your weight loss goals. The number of calories that you need to lose weight will vary greatly from person to person. It will depend of factors like sex, age, existing weight, metabolism, activity level and physical condition.

It's generally easier to lose weight if you're a man, young and physically active. In most cases, because a man's metabolic rate is higher due to testosterone and his increased muscle mass, a woman's daily calorie intake must be less than a man's to lose the same weight. Though the numbers will vary widely, as a general rule most overweight women will have to decrease their daily caloric intake to around 1200 calories a day to lose weight. For most men, a reduction to 1800 calories will usually be enough.

But, again, these are general guidelines that may or may not apply to you. If you have an extremely low metabolic rate, you may have to cut back calories even more. On the other hand, if you embrace an active lifestyle with plenty of exercise, you may not have to cut back this much. The more active you are, the more calories you'll burn.

Unless you're extremely sluggish or your goals are excessive, you won't have to torture yourself with the huge calorie reductions you see on other diets. Unlike the high-carb diets that lead to high insulin levels and a lot of body fat, the Metabolic Diet cuts insulin short before it's allowed to do its dirty work. Your calories won't be loaded with so much fat potential and the nature of the diet itself will likely lead you to increased activity. This will insure that you won't have to go into "starvation" mode to lose weight.

Age also plays a role. As we get older, our energy needs decline. We tend to ride where we used to walk, sit where we used to stand and take the elevator instead of the stairs. TV can become much more enticing than a more active night out. Unfortunately, our appetites have a tendency to stay the same.

This inevitably leads to middle age spread. How much depends on the difference between the calories we take in and the calories we burn up. Older people may find themselves having to cut calories more dramatically to lose weight unless they find a way to accelerate their lifestyle. Again, a regular exercise program can pay huge dividends.

How Fast Should I Lose?

Most people have no idea what a reasonable weekly weight loss should be. They listen to some of the diet gurus and think they should be losing one or two pounds a day. In other cases, they've dieted before and found themselves starving their way to massive losses the first week or so before giving up and gaining it all back again when they found the diet impossible.

The fact is that almost anybody can lose 5-10 pounds the first week of a diet and many can lose half that amount in the second week. I've had patients who required a very limited calorie diet losing as much as 28 pounds in the first two weeks. One young lady who was extremely obese lost 48 pounds in the first month of her diet and found herself buying not only new clothes but also new shoes two full sizes smaller than before. That's testament to how much fluid she was retaining and how much of an early weight loss can be attributed to water loss.

But for most people, I don't prescribe this kind of program. In fact, at the beginning of the Metabolic Diet, weight loss isn't important. As I stressed above, it's more important to make the "metabolic shift" and get comfortable with the diet than anything else. The weight loss will come soon enough.

Once you've habituated to the diet, you should aim at losing 1.5-2 pounds per week. Losing this amount makes for realistic goals and insures that you won't lose appreciable body tone as weight is dropped. After all, the point here is not just to lose weight but also to create an attractive and fit body.

Depending upon your present weight and calorie level, you may find yourself losing much more than this the first several weeks of the diet and that's OK. But after you've gone through that initial loss, you should look to stabilize at the above level. If you find yourself losing less than 1 pound during a week, you'll know that it's time to cut back on calories a bit the next week if you want to continue losing. Likewise, if you're losing more than 2 pounds, you'll know you're cutting calories too fast and will need to add some the next week.

Keeping Track

Though you will find weight loss easier on the Metabolic Diet, you're still going to run into periods where the weight just seems glued on. You can't seem to take it off. At this point, many people panic. The fact is, these setbacks are very natural and you can't concern yourself with them too much.

In fact, the longer you're on any diet the harder it is to lose weight. There are several explanations for this. As you lose weight, you'll need fewer calories per day to function than when you were heavier. It's easy to see that an 1800-calorie diet will result in weight loss for a 250 pounder but the same diet won't do much when you

weigh 100 pounds less. As you lose weight, you'll have to adjust calories to continue losing weight at the same level. Because the Metabolic Diet takes a more gradual approach to weight loss, this won't be as much of a problem for many people, but, still, at some point in the process you'll get to a level where it will become harder to lose.

You also must remember that as you diet the body decreases its metabolic rate so you need fewer calories to survive. The body is very quick to protect itself, and if it perceives that famine or food shortage is on the horizon (it can't tell the difference between real famine and a diet) it will begin to slow down to save on calories expended. Though you may be at the same activity level, you'll be burning fewer calories as your body tries to adjust for the fewer calories being taken in.

People also have a tendency to stray from their diet as the weeks go on. While this isn't as much of a problem on the Metabolic Diet where all foods are available at some point in the week, nobody's perfect. You're going to binge or surrender to a social occasion at some point. Another thing that happens is that people may gradually find themselves increasing the portions they eat without even noticing it. This can also cause you to stall.

That's why we urge you to keep track of inches as well as pounds on the Metabolic Diet. Losing the weight is important, but there will be times where weight loss will stall because of the above. Indeed, there will be many times where you won't be losing weight but you'll be losing fat. Maybe you'll have lost fat and picked up some muscle from the diet and your exercise program, and the two will have cancelled each other out in terms of total weight. You may weigh the same, but you look better, are trimmer and feel better. You'll be at the same weight, but your body's made massive strides toward the shaping you want.

Getting out the old tape measure and measuring your vital numbers at problem areas like the waist, hips, upper thigh, chest and upper arm will often give you a better idea of how you're doing than the bathroom scale.

Scale Weight Can Be Misleading

The possible pitfalls of measuring your progress by the bathroom scale deserve a bit more discussion. Scale weight can be very deceiving. For instance, you may have two people who are roughly the same height and both weigh 180 pounds. But they may not look alike. One fellow may possess a spare tire that would make the Michelin Man envious and a belly far bigger than his chest. The other may have a chest much bigger than his belly. He's fitter but, because he's better developed than the other, may weigh exactly the same. Weight can be meaningless.

Indeed, yours truly is a case in point. I've been a dedicated athlete and a World Champion in Powerlifting and have done my best to stay in shape over the years. Today I'm 5 foot 6 inches tall and weigh 185 pounds. If I go by those charts they're always bringing out, you'd expect me to be grossly obese. Yet, my body fat level is 9-10 percent maximum. I'm in great shape; I look good, the way I want to. I'm not obese. It's not just that "muscle weighs more than fat," it's that you can't compare having lots of muscle in the right places to having lots of fat in the wrong places. You may weigh the same, but you sure as heck won't look the same.

Meanwhile, you have to remember that weight can fluctuate wildly on a daily basis, especially for women. Fluid retention or special events that change your eating patterns can spell the difference of several pounds. If you're weighing yourself every day, you can get very discouraged. The truth is these are temporary weight gains or inches gained and they'll disappear in a few days.

I recommend that you don't weigh or measure yourself daily. Weighing or measuring on a weekly basis will be more than enough to give you a good idea of where you're going. This is very important for women, for whom temporary weight gains can be common.

In fact, women should probably weigh and measure themselves in relation to their periods. Fluid retention and especially the girth around your stomach will vary greatly right before and after your period. Four to five days after your period begins, you'll lose all the fluid and girth you've built up and be back to normal. Before that, you're not going to get an accurate measure of your progress. For some women, it may make the best sense to weigh or measure once a month. The sixth or seventh day after your period begins should be best for most women.

Don't fool yourself, however. Some dieters blame water retention when in reality they just haven't been true to their diet. If any weight gain continues after your period, you can bet that fluid is not the problem.

What's Your Ideal Weight?

Most people have a target weight in mind that they'd like to reach and maintain where they think they look their best. This is only natural. But too many people set goals for themselves that are not reasonable. When setting these goals, I can't overstress how important it is to be practical.

I've had many patients come to me for weight reduction with entirely unreasonable expectations. Even those people who are supposedly "going by the charts" can be misled because those charts often don't take into account various body structures and individual differences.

Chapter 5: What's Your Ideal Weight?

A woman patient will come to me. She'll be 5 feet 6 inches, with medium bone structure, weighing in at 215 pounds. She'll stand there and look me in the face and say, "I want to get down to 115 lbs," though this is totally wrong for her. Her "ideal weight" would probably be somewhere in the 135-145 range. She'd be in trouble at 115. It just wouldn't be healthy.

Unrealistic goals can also be very counterproductive. If a woman weighs 180 pounds and says she's going to get down to 125, that can really work against her. She may lose 20-25 pounds and find herself in the 160 pound range and holding for one reason or another. But instead of feeling proud and motivated, and thus knowing that she'll be able to break her holding pattern, she's got it in the back of her mind that she's still got 35 pounds to lose. She gets discouraged and this can really play havoc with her overall dedication to a sensible diet.

Instead of setting these "ideal weight" goals, I think it's far better to put your goals on a weekly basis (like the 1.5-2 pound loss outlined above). Best of all, I think it's wisest to keep the scale locked up except for the occasional use and measure your progress by the way you look and feel.

The best way to do this is to forget setting weight goals and, at the beginning of your diet, establish a mental image of how you want to look. It can be your own mental picture of a successful you or the overall look of a friend or somebody else you know. I've helped thousands of people lose weight over the last 20 years and, for most, this devotion to achieving your mental image seems to work far better and provide superior motivation to weighing yourself.

Besides, the reason you're losing the weight is to get the body you want. I think it's far better to keep that realistic body image you're shooting for in your mind and measure your progress according to it. Think of the way you want to look and feel. What do you want to see in the mirror looking back at you? That's your goal, not some arbitrary number on a scale that might or might not indicate your level of fitness, health and attractiveness.

So, don't pick a goal weight. You can keep a running weekly total on pounds and inches and measure your body fat progress with your calipers. If you have access to equipment that will measure total body fat, use it. Men should keep in mind that ideally they should maintain a body comprised of around 10 percent or less body fat. Women should be at or lower than 18 percent.

Whatever you do, don't make weight your final destination. Its how you look that is important. Pick a realistic body look that you'd like (remember that most of us aren't going to make Fabio or Cindy Crawford territory) and strive for it. This is much more likely to motivate you and it's also a more accurate barometer of your progress. If you're doing things right on the Metabolic Diet, it will show up in the mirror quite clearly. You don't need the scales or charts.

Some people have found it helpful to periodically take pictures of themselves to check on their progress. Looking at a photo can be more objective that looking at yourself in the mirror. If you've had a bad day or bad week, it may color your perceptions when you look in the mirror. You can be looking at yourself through the filters of emotion that you're experiencing that day. You may find that taking regular pictures of yourself can provide a more objective view of your overall progress and appearance.

Weight Maintenance

Once you attain the body you want or can't lose any more weight your task changes. Losing weight or fat is no longer the most important thing. Keeping that body that you've worked hard to create is. And, as most of us know, keeping that body can be more difficult than creating it. There's a tendency to say, "OK, I've done it!" and let up. You start hedging on your new lifestyle and begin to go back to the way you were eating before. This is, of course, a big mistake.

The fact is that the experimenting and adventure doesn't end when you reach your goal. You're going to have to begin to try different portion sizes and calorie levels to see what level allows for weight maintenance. On the Metabolic Diet, many will find themselves eating substantially more calories than they would on another diet and maintaining their weight.

Others may not find it as easy. The proper caloric level for weight maintenance will be a very personal thing. It will depend on all those factors we mentioned above - sex, age, weight, metabolism, activity level, fitness - and the answer will vary from person to person.

You'll want to stay on the Metabolic Diet, of course, and this will greatly aid you in your maintenance efforts. But beyond this, the only real guide seems to be: "If it works for you, use it!" Continue to experiment with different foods to see how you react. Try different high-and low-sugar foods and fat percentages on the weekend. Discover what makes you feel best while keeping the weight off.

Your body will take awhile to adapt to your new weight and, while it does, you must remain vigilant and dedicated to not gaining weight or losing the body you've built. Don't jettison the healthy lifestyle and habits you've developed. Stick with them. Eventually, your body will adapt to the new you and it will become relatively easy to maintain it.

Body Composition And Tracking Your Progress

There are a variety of methods you can use to determine your body composition and as such your level of muscle mass and body fat. Some methods are more accurate than others. The methods most commonly used are the height and weight tables and the Body Mass Index. Most of these accepted methods tell you nothing about your

body fat levels and whether your "excess" weight is due to muscle mass. Other methods determine your body fat and lean body mass levels, but some require precision equipment or competent technicians to take the measurements and use the accompanying formulas. Let's discuss some of the various methods used.

Height And Weight Tables

A simple method of estimating ideal body weight can be found with a number of height and weight tables that are generated by many sources including government organizations, private medical facilities and large insurance companies. A sample is in Appendix 1. These tables are easy to use but tell you very little about the degree of lean body mass compared to body fat levels. It's assumed that if you fall into a certain category and if you're within so called normal parameters, i.e. a pencil neck geek, then your muscle mass and body fat levels are OK. The only problem is that a muscular man, who is at 5'8" tall, has a solid body weight of 195 lbs. with a medium frame and at 10% body fat is considered obese if you go by these tables.

Body Mass Index (BMI)

BMI is a mathematical calculation that gives you a number that correlates with the risk of diseases associated with obesity. BMI is normally calculated by dividing your body weight in kilograms by your height in meters squared; however, for the sake of simplicity, equations are available that use pounds and inches.

In general, as BMI increases so does your risk for disease. The math equation breaks down a bit for people who are extremely muscular, so body builders, football players and many athletes in power-oriented sports will actually find that their BMI scores place them in a category at "higher risk" for diseases associated with obesity. So, although BMI is one of the most scientifically accepted methods of estimating healthy weight, it's just an estimate and it is less accurate for more muscular people.

To calculate your BMI enter your weight in pounds and your height in inches into the following formula.

BMI=(body weight in lbs. / height in inches squared) * 725

Here's an example.

I'm 5'6" and weigh 185 lbs.

My BMI is 185/662 * 725 = 185/ 4356 * 725 = **30.8**.

Generally acceptable ranges

- **Men: 18 to 22**
- **Women: 20 to 24**

That puts me in the obese category although I have less than 10% body fat.

So again, BMI is a useful tool to give you a quick and easy estimate, but it's far from perfect. For our purposes BMI is not enough. We also need to find our body fat percentage and use this figure along with the BMI to come to a better idea of where we stand as far as our lean body mass and body fat levels.

Body Composition And Body Fat

We all know what body fat is. It's that stuff between our skin and muscles that is supposed to keep us insulated, cushion some of our internal organs, and serve as an emergency energy supply. We know it can be useful stuff, but we still don't want too much of it. That's because most of us have more than we need and it's just not pretty to look at. Too much body fat makes us less attractive, turns those gentle curves into mounds of cellulite, and if it's internal, can give us the venerable beer belly even if we're teetotalers.

The Different Kinds Of Body Fat

There are various forms of fat: brown fat, subcutaneous fat and visceral adipose tissue (VAT). As adults, the only two that are important are the VAT and the subcutaneous (under the skin) white fat. Both kinds of fat are considered undesirable. VAT fat (the stuff most potbellies are made of) is more sinister than subcutaneous fat since it's been correlated with an increased incidence of diabetes and heart disease. Subcutaneous fat, while not necessarily unhealthy unless it's excessive, just looks bad.

The Difference Between Men And Women

Fat is fat. However, the amount of fat and the distribution vary between men and women. Men tend to have more fat in the midsection, both as subcutaneous and as visceral fat. Women, on the other hand, tend to have more fat in the lower abdomen, buttocks and upper thighs. Also women tend to have more problems with cellulite, the dimpling of fat that tends to accumulate in the buttocks and thighs.

Cellulite, a term coined for commercial reasons, is simply regular fat that looks lumpy because it's hard packed between strands of connective tissue. In order to get rid of cellulite you have to lose overall body fat. You can't exercise it, roll it or massage it away. It's also difficult to suction if off unless it's only in very discreet pockets.

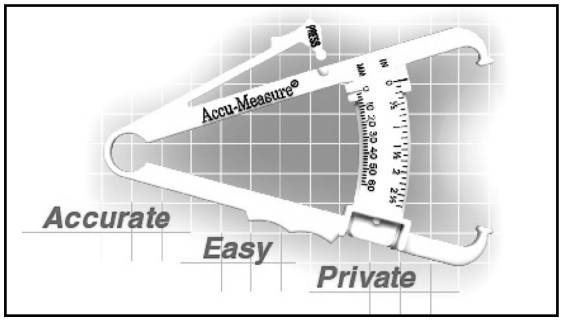
Measuring Body Fat

There's lots of ways to tell if you're going the right way down the fat loss road. Some are good, some bad and some downright ugly. The easiest way is to strip down and have a look at yourself in a full-length mirror. No escaping reality here. Unfortunately, this is not something most of us want to do on a regular basis. And if we do, sometimes we start lying to ourselves.

The next best way is to let our clothes do the talking. No matter how much we try to convince ourselves that we have a dryer and washer that are sabotaging our clothes, and that manufacturers of clothes today are making their clothes for skinnier clientele, sooner or later we realize that we're just fooling ourselves. So what we need are more objective ways of checking out just how we're doing.

Measuring Your Body Composition And Progress

The most accurate and scientific way to determine your body fat percentage is by hydrostatic weighing. This test is conducted in a special tank and compares your weight completely under (with all air exhaled out of our lungs) and out of water.



The Accu-Measure™ Calipers

Hydrostatic weighing is based on the concept that the density and gravity of lean tissue is greater than than that of fat tissue, so lean tissue will sink in water and fat tissue will float. While hydrostatic weighing is the best measurement, it can be costly, inconvenient and time-consuming. Other methods of determining body fat levels, such as the Bod Pod, a device that uses air displacement instead of water, while more convenient are also costly and unavailable to most of us.

Another way to measure body fat percentage is with anthropometric measurements. Measurements are taken with a measuring tape at sites where fat is usually distributed, such as the waist and thigh. Specific equations are used to calculate the body fat percentage. These measurements, while less costly and easier to do, are not very accurate.

Overall, body fat percentage can best be measured with skin fold calipers. If done correctly calipers are an accurate, inexpensive and convenient way to measure the thickness of subcutaneous fat. This technique involves measuring fat in the body by assessing levels at certain key fat deposits with the skin calipers. You can have the skin fold test performed by a professional, or you can do it yourself by purchasing the calipers along with easy to follow instructions.

For the purposes of the Metabolic Diet and to keep things as simple as possible, we will only measure one site. We also suggest using the Accu-Measure Calipers, a precision instrument that has been shown in comparative studies to be closer in accuracy to the "gold standard" underwater weighing than any of the more elaborate methods of measuring body fat. It also lacks the inconvenience, expense and trained personnel and lack of privacy that these other methods entail.

With the calipers you can determine your percentage body fat by taking skin density measurements of the suprailliac area. This area is approximately one inch above the right hipbone about five inches or so to the right of and just below your belly button (Figures 1- 5).

FIGURE 1

FIGURE 2

FIGURE 3

FIGURE 4

FIGURE 5

As per the diagram, while standing firmly pinch the suprailliac skinfold between your left thumb and forefinger. Place the jaws of the calipers over the skinfold while continuing to hold the skinfold with the left hand. Then take your measurement as per the instructions and the diagram. Once you have the measurement refer to the body fat interpretation chart in Appendix 8 (also included with the calipers) to determine your body fat percentage.

While knowing your body fat level is a step forward, it tells you nothing about your level of lean body mass. To get the complete picture and accurately measure your present status and progress we need to find out our Metabolic Index.

Chapter 5: **The Metabolic Index**

The Metabolic Index™

The Metabolic Index (MIDx) is the best way to measure your progress while you're on the Metabolic Diet. The MIDx takes into account all the variables that other methods can't. Not only does it address the height/weight issue but also the degree of body fat. With the MIDx you get a snap shot of your body composition and progress.

What is the MIDx and what does it measure? The MIDx is a ratio derived by considering not only weight and height but also your percentage of body fat. It uses a very easy formula for calculating. In fact, just fill in your weight in pounds, your height in inches and your body fat level as a percentage into the following formula and do the calculations.

Here is the Formula:

Body weight in pounds divided by the height in inches squared, multiplied by 7,250 and the results divided by the percent body fat.

- **Enter Your Weight in Pounds** _____
- **Enter Your Height in Inches^2** _____
- **Enter your % Body Fat** _____

{(body weight in pounds) / (height in inches)2 * 7,250} / % body fat.

If you can't be bothered doing the math, why not put this formula in a spreadsheet or better still, go to www.MetabolicDiet.com and plug your numbers in for an instant readout.

My MIDx is 185 / (66)2 * 7,250 divided by 10% = (185 / 4356) * 7,250 / 10

Final result is that my Metabolic Index = 30.8

Even though I'm heavy for my height, I have a fair amount of muscle mass and low body fat. So rather than looking fat, I look trim and muscular.

Let's say that I go on the Metabolic Diet and get down to a minimal 175 lbs. and 8% body fat. My MIDx would then be 36.4. The increase in the MIDx shows that at 175 lbs. and 8 % body fat I'm carrying less fat in proportion to my muscle mass than at 185 lbs. and 10% body fat. This shows that I'm making good progress although my muscle mass and body fat levels are more extreme than most men would want, but not as extreme as a competitive bodybuilder might want.

The important thing about the MIDx is that it will give you a starting point and from there an indication of how you're progressing every step of the way. Once you've established your baseline MIDx, it's easy to objectively see if you're making progress, if you're losing body fat, but not at the expense of important muscle mass. If the MIDx is going up, even minimally, you're making progress.

The higher the Metabolic Index, up to a point, the better your improvement and the closer you are to your goals. The lower the Metabolic Index is, the more room for improvement there is and a determination of just how much more you have to go to reach your goals.

The ideal for the average woman is different than the ideal for average man. For women the ideal is around 13 to 20 while for men it's between 22 to 32. I'm at the higher end of the normal range due to my lean-mass and muscularity. In reality, the final point doesn't really matter since it's the improvement that counts. As long as the index keeps going up then there is some improvement being made. Once the index gets above 18 for women and 32 for men you've looking at muscle mass and body fat levels that are extreme for most of us but not to those who aspire to bodybuilding and competitive fitness standards.

In reality, the MIDx is an indicator that when you're losing weight you're close to maintaining or even increasing lean body mass as you lose body fat. In fact, the more lean body mass you have and the less fat, the better the index. If someone loses even a lot of weight, but loses too much lean body mass the index won't improve all that much. What that means is that even though the person has lost weight they look very flabby and therefore lost the weight by sacrificing muscle mass. This is exactly the opposite of what most people want. They want to lose weight but they also want to look slim and trim.

Now that you've determined your Metabolic Index and we know how to measure your weight and fat-loss progress, you can go ahead and set your weight/muscle-mass/ fat-loss goals.

Making The Diet Work For You

You can use aspects of the Metabolic Diet to help you look good for any social events you may be looking forward to. Many people find their body looking its absolute best 48 hours after completing the carb-loading phase of the diet. It's at this point that insulin unleashed by the carbs has your body in its firmest, most attractive state while the fat burning properties of the diet are working in high gear. You'll look your very best during this time frame.

Paying close attention to your body during the week can pay big dividends in this area. Learn where you look your best during the week, be it 48 hours or only 24 hours into the weekly phase of the diet, and let it work for you in social situations.

Chapter 5: Making The Diet Work For You

If you have a big event coming up on a Thursday and know you look your best 48 hours after loading up on carbs, adjust the diet so your carb loading phase runs Monday-Tuesday so you'll look your best on Thursday.

The above is, of course, just an example. You'll have to work with the diet to find the best approach for you. But along with it's flexibility and practicality, this ability to get to know your body and work with it to make it look it's best is one of the big pluses of this diet. Not only does the Metabolic Diet burn fat and firm you up, it also gives you a weekly opportunity to practice on your body so you know how to manipulate your diet to make you body look the best it possibly can.

Keys to Success On the Metabolic Diet

- **Don't seek weight loss at the beginning.**
- **Caloric intake will vary between individuals.**
- **Try to lose 1.5 - 2 pounds weekly.**
- **Keep track of inches as well as pounds.**
- **Use calipers to measure body fat.**
- **Weigh/measure no more than once weekly.**
- **Don't pick an ideal weight.**
- **Goals are 18 percent body fat for women/10 percent for men.**
- **Rely on the mirror more than the scales.**
- **Don't change your lifestyle or habits once you reach your target weight.**
- **Experiment with caloric intake to find a proper maintenance level.**
- **Experiment with foods.**

Chapter 6

Good And Bad Fats

Chapter 6: What Are Fats?

Using Your Head

Before we get into the specifics of how best to mentally approach the Metabolic Diet, you'll need to become better acquainted with its basics. Only by "using your head" to intelligently choose foods and keep yourself motivated and committed will you achieve the most progress and success.

One key to your success will be in understanding the difference between "good fats" and "bad fats", maximizing the former, minimizing the latter and eating the different kinds of fat in the proper proportions. While some of the information in this chapter may be somewhat technical, the recommendations and applications will be easy to understand and apply.

What Are Fats?

For many years, most diet gurus have been preaching the ills of dietary fat. The fact is that dietary fat is essential for good health. They are necessary for the proper absorption, transportation and function of the fat-soluble vitamins A, D, E, and K. Lipids (a general term for all types of fats) are used by the body to produce hormones and other substances than can aid good health and protect against degenerative diseases. They're also an excellent energy source, much superior to the fruits, vegetables and other carbs the Experts keep hailing at the expense of other foods.

Components of lipids known as "essential fatty acids" (EFAs) are necessary building blocks for all cell membranes in the body. They also make up many of the more intricate structures inside the cells. The retina (which turns light into nerve impulses in the eye) and nerve synapses (which join the body's individual nerve cells) rely on EFAs for structure. These are the types of fat that are essential to life.

However, there are other fats that can actually destroy good health and lead to serious problems down the road. To understand the difference between these "good fats" and "bad fats" we need to look at the basic chemical structure of fats to see how they vary.

Fats and oils (an animal or plant fat that is liquid at room temperature) are made up of a number of repeating molecular units. One molecule of fat consists of a single molecule of an alcohol called glycerol combined with three molecules of fatty acids. The fatty acids are made up of chains of carbon and hydrogen atoms with a methyl group (3 atoms of hydrogen, one carbon) at one end, chains of carbon and hydrogen atoms in the middle, and a carboxyl group (made up of carbon, oxygen and hydrogen) at the other end. The hydrogen atoms are connected to each carbon atom and their number and position determine the degree of saturation of the fatty acid and its shape.

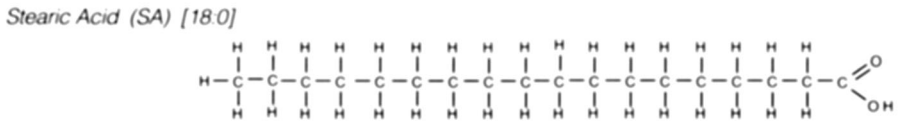


Figure 6: Saturated Fatty Acid

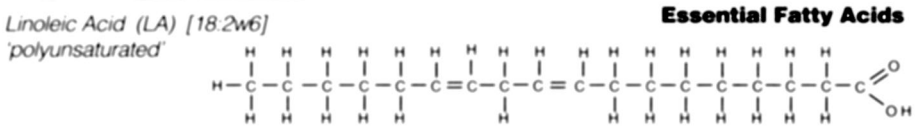


Figure 7: Unsaturated Fatty Acid

Fatty acids can be classified as either "saturated" or "unsaturated". In the diagrams above, you'll note that the "saturated" fatty acids contain carbon atoms that are linked to two hydrogen atoms. They are thus "saturated" with hydrogen atoms because they are linked to as many hydrogen atoms as possible. The term "saturated fat" refers to the hydrogen atoms attached to the carbon atoms.

In the "unsaturated" diagrams above, you'll note that a double bond joins several of the carbon atoms together. When a double bond is present, each carbon atom will only be attached to a single hydrogen atom. The carbon atoms are no longer connected to the maximum hydrogen atoms and are said to be "unsaturated". A "monounsaturated" fatty acid contains a single incidence of double bonds along its chain. A "polyunsaturated" fatty acid would feature two or more connections along its chain where two carbon atoms are double-bonded.

The hardness of a fat decreases with the increase in its double bonds. As a result, most of the liquid fats like vegetable and fish oils are polyunsaturated. Sometimes food producers will add hydrogen to the double bonds of a chain to make them less unsaturated in a process called "hydrogenation". In this way, vegetable oils can be hardened into margarine for use as a spread and shortening for use in cooking.

Chapter 6: Good Fats

Good Fats

The two essential fatty acids linoleic acid (LA) and alpha-linolenic acid (LNA) (also called omega fats) are critical to health and must be supplied in a person's diet since the human body can't manufacture them.

Linoleic acid is classified as an omega-6 fatty acid. Omega-6 fatty acids are polyunsaturated fatty acids that have their endmost double-bond six-carbon atoms away from the CH3 end of a chain. Alpha-linolenic acid is an omega-3 fatty acid. Omega-3's are polyunsaturated fatty acids with their endmost double-bond three-carbon atoms from the CH3 end.

Many people do not get sufficient amounts of EFAs in their diets. Getting enough LNA seems to be more of a problem. This of course can cause health problems because these EFAs are necessary for growth, the integrity of cell membranes and the synthesis of important hormone-like substances called eicosanoids.

Now this is where we have to get very technical. But bear with me; the end result of this discussion will be easy to understand recommendations that will improve your health and the effectiveness of the Metabolic Diet.

The Eicosanoids: Piecing Together The Puzzle

Eicosanoids are physiologically active metabolites of EFAs with important effects on the immune, cardiovascular and central nervous system. Amongst these are prostaglandins and arachidonic acid, from which the eicosanoids are synthesized.

Eicosanoids act locally in and around the tissues in which they are produced. Virtually all cells in the body can form some of the eicosanoids, but tissues differ in enzyme profile and consequently in the products they form. They also differ in their ability to be affected by specific eicosanoids. Eicosanoids are not stored to any degree and must be synthesized in response to immediate need.

While it would be advantageous to be able to direct eicosanoid production so that good eicosanoids would be produced deferentially to bad ones, it is difficult to do so because of the complexity of eicosanoid production, actions and metabolism. Unfortunately we don't know a lot about the dietary influences that affect the known eicosanoids and thus can make only limited use of any knowledge we do have.

For example, some of the bad eicosanoids, such as PGE2, a series two prostaglandin that increases platelet aggregation and inflammation and has adverse effects on the cardiovascular system, are derived from arachidonic acid. We could thus reason that by inhibiting the enzyme that catalyzes the synthesis of arachidonic acid, less PGE2 would be formed. As well, more metabolites would be present for forming some of the good eicosanoids such as PGE1, a series one prostaglandin that has several favorable effects on blood clotting, inflammation and the cardiovascular system.

We know that various factors such as eicosapentaenoic acid, glucagon and even cholesterol and alcohol can inhibit the formation of arachidonic acid or the formation of PGE2 from arachidonic acid. However, utilizing this knowledge to manipulate the eicosanoids is difficult since we really need more information on the complex ways these compounds are formed, act and are metabolized. Although we could possibly formulate a working game plan, it wouldn't be written in stone and has to be validated by ongoing research.

For example, prostaglandins can be both good and bad. Unfortunately, it is difficult to stimulate the good ones and not the bad ones. If we decrease the formation of prostaglandins from arachidonic acid, we inhibit the formation of both good and bad prostaglandins. Of more relevance for dieters, it is not possible to differentially stimulate the production of PGI2, which has a lipolytic action, from PGE2, which has an antilipolytic action. Both prostaglandins belong to the series 2 prostaglandins and are formed from arachidonic acid.

At present, some treatment strategies using EFAs have tentatively been formulated to try and take advantage of the good eicosanoids. For example, omega-3 fatty acids found in fish oils can decrease production of some arachidonate metabolites and increase levels of certain prostaglandins. Feeding of these fatty acids has been used as a therapeutic strategy to diminish platelet aggregation.

Confused? So are most people, especially since all the pieces to the puzzle haven't been uncovered. The gist of trying to modify your intake of the omega 6 and omega 3 fatty acids is that we can, by the use of a special diet, direct the flow of linoleic acid to the good eicosanoids instead of the bad eicosanoids. This may be done by increasing the transformation of linoleic acid to gamma-linolenic acid (GLA) and/or supplementing GLA by using GLA-rich oils, and directing the formation of the good eicosanoids instead of arachidonic acid (see figure on next page).

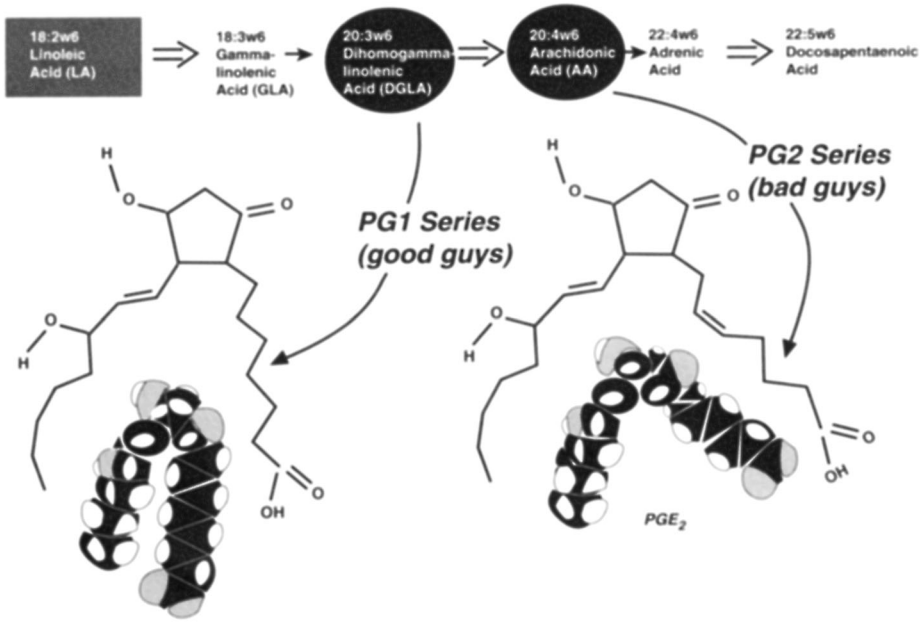


Figure 8: from "Fats that Heal Fats that Kill" by Udo Erasmus, *alive* books, Vancouver

There are many factors that can inhibit the enzyme delta-6-desaturase, the enzyme responsible for the conversion of LA to GLA. These factors include LNA (the other essential fatty acid), trans fatty acids (see below), stress and viral infections. By limiting these factors, more GLA can be naturally formed from dietary LA.

As well, there are many factors that can inhibit the delta-5-desaturase enzyme, the one responsible for the formation of arachidonic acid from dihomo-gamma-linolenic acid (DGLA). These factors include glucagon and EPA. Insulin increases the formation of arachidonic acid from DGLA and thus increases the formation of the bad eicosanoids.

So, in theory, dietary practices can limit the production or transformation of arachidonic acid and encourage the production and transformation of GLA, thus maximizing the production of good eicosanoids over the bad ones. It's difficult, because we don't have many pieces of the puzzle to say if this is true. If further substantiated by research, this way of altering eicosanoid synthesis though changes in our intake of EFAs may well be one of the few coordinated practical uses of the complex scientific information on the eicosanoids. While we may not know for sure if what were doing accomplishes the changes we'd like to see, we can make certain dietary recommendations that fit in to the available research.

In the Metabolic Diet, I discourage excess carbohydrate consumption and encourage the use of good fats in the diet, including the use of fish and fish oils and sources of GLA such as evening primrose and borage seed oils. At present, the best we can do is to make sure that enough and the right proportion of the EFAs and other members of the omega-6 and omega-3 fatty acids are present in the diet.

The omega-3's like LNA and eicosapentaenoic and docosahexaenoic acids (known as EPA and DHA, respectively) are critical to anyone concerned with dieting. They increase fatty acid oxidation (burning of fat), basal metabolic rates and lower cholesterol. Omega-3 fatty acids also provide an anabolic effect by increasing the binding of IGF-1 to skeletal muscle and improving insulin sensitivity, even on diets high in fat which have a tendency to decrease insulin sensitivity.[133] As well, fish oils may also have important implications for women prone to osteoporosis since they appear to decrease calcium excretion.[134]

Omega-3's also stimulate prostaglandin production. Prostaglandins are eicosanoids that regulate activity in body cells on a moment-to-moment basis and are involved in critical functions like blood pressure regulation, insulin sensitivity, immune system and anti-inflammatory responses. They're also involved in literally hundreds of other functions, many of which have yet to be fully identified in research. If you have a problem producing prostaglandins or experience an imbalance between the different kinds of prostaglandins, overall health can be radically affected.

The series three prostaglandins are formed from EPA. As well, EPA reduces the production of the bad prostaglandins from arachidonic acid. EFA deficiency can lead to high blood pressure, hormonal dysfunction, impaired immune function, coagulation problems, inflammatory changes, dry itchy skin, peripheral edema and many other conditions.

Conjugated Linoleic Acid

Conjugated linoleic acid (CLA) is a mixture of isomers of linoleic acid, which is found preferentially in dairy products, meat, and in cheese, milks and yogurt that have undergone heat treatment. Supplementation with four ounces of cheddar cheese daily was found to increase the ratio of CLA to LA by 130%.

CLA has been shown to have properties above and beyond those of linoleic acid. It has shown potential as a powerful anticarcinogen,[135,136] and has potent antioxidant activity.[137] Recent studies have suggested that CLA may be toxic to human cancer cells in the body.[138] Of the vast number of naturally occurring substances that have been demonstrated to have anticarcinogenic activity in experimental models, all but a handful of them are of plant origin. CLA is unique because it is present in food from animal sources, and its anticancer efficacy is expressed at concentrations close to human consumption levels.

Chapter 6: Essential Fatty Acids And The Metabolic Diet

So now we have a better understanding of the types of dietary fats and their influence on health. We can now discuss the importance of EFAs in the Metabolic Diet.

Essential Fatty Acids And The Metabolic Diet

EFAs can be beneficial even if a deficiency doesn't exist and, if used properly, can increase overall health, help you avoid heart disease and lose body fat. Overall, the increased processing of foods in our society has lowered the amount of EFAs in the average diet significantly. Foods rich in EFAs are highly perishable and not deemed practical or profitable for most commercial preparations. The extra EFAs you'll get from the Metabolic Diet, as explained below, is just one more reason for giving the diet a try.

Earlier in this book we talked briefly about the omega-3's as a positive factor in high-fat diets. They're found to a high degree in fish oils (as EPA and DHA) and have been hailed as a major factor in lowering serum cholesterol levels, preventing coronary heart disease,[139,140] and perhaps even preventing or curing atherosclerosis.[141]

Marine oils are a big part of the diets of Eskimo tribes. Although their higher-fat diet would seem to make them prime candidates for heart disease and atherosclerosis, they've been found to be almost immune to cardiovascular problems, at least until Western dietary influences in recent years. Studies have centered on omega-3 fatty acids in the fish oils and their cardioprotective capacities as being central to this phenomenon.[142]

For the person on the Metabolic Diet, where fat and protein are found at high levels, the omega-3's can provide an excellent hedge against worries about cholesterol. Blood pressure, clotting, immune response, insulin resistance and triglyceride levels are all positively affected.[143] Even in cases where dietary cholesterol is increased, omega-3's may aid in actually lowering serum cholesterol.[144] There is some evidence to suggest that in higher-fat diets aerobic exercise also reduces serum cholesterol[145] and thus may improve the effects of omega-3 rich fish oil on cholesterol.

LNA, EPA and DHA can also enhance lipolysis (body fat breakdown),[146,147] and decrease lipogenesis (body fat formation).[148,149] The combined breakdown of stored body fat and decrease in additional body fat can have very positive results for the dieter. You actually end up making less fat and breaking down more of what's already on the body when using these oils.

That's why I wholeheartedly support adding portions of fish and fish oil to your daily diet. And, while many foods contain more than one type of fatty acid, plant oils are usually richer in unsaturated fatty acid content than animal fat. It's not surprising, then, that flaxseed oil, nuts, seeds and unprocessed vegetable oil are also rich in essential fatty acids.

That's also why I formulated an advanced EFA formula that contains all the "usual suspects" as well as other important ingredients. The MD+ EFA+ is a multi purpose formulation designed to provide the full gamut of all the essential fatty acids that are so important in optimizing your metabolism, maximizing the anabolic and fat burning effects of exercise and decreasing the counter productive inflammatory response of exercise.

Fats and The Immune System

Besides the beneficial effects we've already discussed, fats can have dramatic effects on the immune system and can be used to treat patients with immune system problems. For example, it is known that the human immunodeficiency virus (HIV), is able to replicate in many human cells such as helper lymphocytes, monocytes/macrophages and glial cells. Monocytes/macrophages must be considered an important reservoir of HIV in the body and producers of cytokines such as interleukin-1 (IL1) and tumor necrosis factor (TNF).

These substances lead to a feedback loop that produces increased virus replication and a secondary production of other cytokines such as interleukin 6 (IL6) and granulocyte-macrophage colony stimulating factor (GM-CSF). These cytokines all together may be responsible for many clinical aspects of the HIV such as headache, fever, anorexia, subtle cognitive changes, and motor dysfunctions.

Omega 3 polyunsaturated fatty acids (omega 3-PUFA) are one of several compounds that can be used to both strengthen the host and attack the virus. Omegas 3-PUFAs have been shown to have significant modulating effects on the immune system in both man[150] and animals.[151] Their ability to decrease IL1 and TNF production by monocytes/macrophages and consequently of IL6 and several proteins may have beneficial effects on many clinical manifestations of AIDS.[152]

In the literature there are many confusing associations of dietary fat and immune function. It's well known that low fat diets suppress the immune system partly because of the potentially low levels of dietary essential fatty acids. Conversely, a recent study has shown that high fat intakes do not have any deleterious effects on the immune system of the well-trained runners.

In fact, a new study shows those athletes who train hard and cut back on fat may actually increase their susceptibility to infections and inflammation. Researchers found that long-distance runners who severely restricted their fat intake ended up

depressing their immune systems. Runners who ate medium- and high-fat diets (composed of 32 and 41 percent fat, respectively) had no immune system problems. Protein was kept at 15 percent no matter which diet the runners were on. An increase or decrease of carbohydrates made up the difference in calories between high- and low-fat diets.

The higher-fat diets may lower proinflammatory cytokines, free radicals and hormones and enhance the levels of anti-inflammatory cytokines. Cytokines are messenger molecules that call cells to start or end inflammation at a site in the body. The inflammatory process is the body's response to infection or injury; swelling and pain can result as this tissue-repairing process takes place.

While researchers have shown that moderate exercise appears to enhance the immune system, very high intensity exercise has a negative effect on the immune system. A study investigating the effects of training intensity on the immune system used marathon runners because this sport tends to cause overtraining. As was revealed, the incidence of lingering upper respiratory infections was high in these athletes. I point this out because many athletes who train for a contest, especially bodybuilders and athletes competing in sports with weight classes, will select a low fat diet and tend to overtrain in this period. A moderate-fat diet would be a better choice as far as decreasing immune depression.

Bad Fats

There's a very popular misconception that commercial vegetable oils are a good healthy source for essential and non-essential fatty acids. Nothing could be farther from the truth. The fact is that most of those vegetable oils you see on the shelf of your local supermarket including corn, canola and soybean oils, have been hydrogenated or very heavily refined, and are so overly processed that they can be harmful to your health. Processing not only removes any useful properties the oil had such as EFAs or antioxidants, but depending on the processing can cause immune problems and predispose us to certain cancers.

The problem is that the natural poly- and monounsaturated fatty acids are reactive to light and heat and spoil readily. Even natural polyunsaturated fats, because they are unstable and oxidize readily, have been recently shown to have two serious drawbacks. First of all, they seem to promote certain cancers at a dietary concentration of 5% or more.[153] Secondly, while they can lower total cholesterol they can also lower the HDL [154] and thus increase the chances of coronary artery disease.

To make matters worse, polyunsaturated fats are usually treated in an effort to solve some of the problems associated with their commercial use. A process called hydrogenation has been used for decades to change natural oils into fats that are more solid and stable at room temperature, have a longer shelf life and are easier to use in certain foods and baked goods.

Hydrogenation involves heating the oil in a vacuum and then forcing hydrogen through it under pressure. The process is continued until the required degree of hydrogenation is achieved.

Unfortunately, while hydrogenation and other methods used to refine or change oils, such as chemical solvents, bleaches and heat, may be healthy for business it isn't for our bodies. Not only do these processes destroy any natural qualities present in the natural oils, they create by-products that can be harmful to our health. Trans fatty acids, crosslinked fatty acid chains, and fragments of fatty acid chains produced secondary to hydrogenation can have significant adverse effects on blood cholesterol and increase the risk of heart disease. By competing with EFAs these fats lead to EFA deficiencies and subsequently to a host of other health problems including diabetes, cancer and weight gain.

Trans fatty acids have been the most widely researched of these toxic by-products. Trans fatty acids are found in refined vegetable oils, shortenings, almost all margarines and other oil-based foods, and even in baked and prepared snack foods such as cookies, crackers, and chips. Large quantities of unnatural trans fatty acids are also found as food contaminants during excessive heating of cooking oils for deep-frying and other excessive heat-requiring mass food preparation procedures. They've been found to raise overall cholesterol levels, lower HDL, decrease testosterone and insulin response, adversely affect liver enzyme activity and impair the immune system. They've thus been linked to heart disease, cancer and other diseases associated with aging.

Much of the problem resides with the fact that the shape of a fatty acid is essential to its proper functioning. While trans fatty acids have the same exact number of carbon and hydrogen atoms as the original fatty acid (known as the "cis-fatty acid"), its shape has been greatly changed. This change in shape, from "cis" fatty acid to "trans", causes competition for existing enzymes. As a result, the cis-fatty acids are unable to carry out their proper biological role.

The amount of trans fatty acids, or other toxic by-products, found in a food varies according to the extent and nature of the processing. Generally, vegetable oil products that are hard at room temperature (like shortening or margarine) are more riddled with trans fatty acids than products that are liquid at room temperature (like vegetable oil).

Recently, several studies have pointed to the adverse health effects of hydrogenated fats and the trans fatty acids in them (especially hard margarines, but even soft margarines are suspect), including an increased incidence of heart problems[155] likely secondary to unfavorable changes in serum lipoprotein[a], a strong risk factor for coronary heart disease.[156]

Fats to Avoid

- **All Margarines except those with low trans fatty acid content.**
- **Hydrogenated and Partially Hydrogenated Oil Products & Foods (check those labels).**
- **Shortening.**
- **Old Fats and Oils Of Any Type.**

In addition to the well-recognized roles of EPA, the lack of trans fatty acids in the traditional Eskimo staple diet may also be responsible for their cardiovascular health. This diet contains *cis*-forms of the unsaturated fatty acids in physiologically optimal concentrations and is virtually totally devoid of unnatural and potentially hazardous *trans* isomers of these fatty acids.[157]

These differences in the Eskimo diet would likely ensure the synthesis of eicosanoids from dihomo-gamma-linolenic acid, arachidonic acid and eicosapentaenoic acid in balanced, optimal physiological concentrations.

In summary, bad fats are fats that have been altered by processing and so that they compete with essential fatty acids and thus negatively affect cellular metabolism and structure. There is also some speculation that trans fatty acids may adversely affect insulin sensitivity, decrease fat oxidation and increase fat synthesis. All three of these effects would be counterproductive to anyone on the Metabolic Diet.

Foods containing significant amounts of trans fatty acids usually list hydrogenated or partially hydrogenated products in their listing of ingredients. These foods include baked goods, crackers, candies, almost all fried fast foods, potato chips, and other foods that have or are made with shortening, margarine or refined oils. Keep away from them as much as possible and use the fats recommended below.

Flaxseed Oil

Of the EFAs imbalances, LNA has created the most problems. Linoleic acid deficiency occurs much less frequently than LNA. Thus the diets of most people are much higher in LA than LNA. The excess LA seems to affect the biological action of LNA creating an even greater relative deficiency of LNA. With LNA and the other omega-3's responsible for most of the health benefits of EFAs listed above, this condition becomes even more serious.

One of the best-known sources of LNA (and a good source of LA) available is flaxseed oil (also known as flax oil or linseed oil). Hemp oil, another rich source of LNA (and LA and to a lesser extent GLA) is slowly becoming more available. Flaxseed oil consists of 45-65 percent LNA, 15 percent LA and a lesser amount of monounsaturated and saturated fatty acids.

Flaxseed oil can be an excellent source of LNA and I wholeheartedly support the addition of some flaxseed oil to any diet and, especially, the Metabolic Diet. However, there are some conflicting pieces of information that may limit the usefulness of flaxseed oil.

For example a recent study has shown that increasing dietary LNA (such as with the use of flaxseed oil) elevates tissue EPA concentrations in a predictable manner.[158] Now, we know that increased levels of EPA decrease the production of arachidonic acid and its metabolism into bad eicosanoids.[159] However, increased levels of LNA also decrease the production of GLA from LA because it inhibits the delta-6-desaturase enzyme that converts LA to GLA, and thus decreases the formation of certain good prostaglandins.

What can be we conclude from all this? Well, it seems that while flaxseed oil is a good supplement to our diets, it shouldn't be overdone. Enough should be used to increase our natural production of EPA, but not to decrease the formation of GLA from LA. Thus, as well as some flaxseed oil, I recommend the use of GLA and EPA, as detailed below.

If you use flaxseed oil then make sure it's fresh. Flaxseed oil, like other perishable foods, will spoil or go rancid very quickly. That's why it needs to be refrigerated and used soon after opening. Look in any good health food store or nutritional center and you'll find flaxseed oil in the refrigerated section. If you keep it refrigerated, flaxseed oil will generally last up to six weeks after it is opened.

I usually recommend a minimum of 5 grams of flaxseed oil per day to ensure you get the necessary EFAs. As well as the liquid form, flaxseed oil capsules are available and generally come in doses of 1 gram per capsule. Thus, you can use up to five capsules per day if no other flaxseed oil is used. Fresh unrefined flaxseed oil can also be added to a protein drink or salad (1-3 tablespoons) as a tasty way to supplement LNA.

Evening Primrose Oil And Borage Seed Oil

Both oils are rich in linoleic acid, vitamin E and GLA. Since GLA is a precursor for DGLA, which has been shown to be depleted by steroids, alcohol and other drugs, it has been suggested that GLA therefore provides protection for the liver. DGLA is easily produced from GLA and the use of GLA supplements may lead to the increased production of the good prostaglandins that help fight musculoskeletal inflammation, decrease cholesterol and fluid retention, and have beneficial effects on several hormones in the body.

Thus GLA may be helpful for several reasons. Evening primrose oil, for example, has been used as treatment for a variety of problems including PMS, chronic fatigue syndrome and arthritis. Since GLA is important for the production of several prostaglandins used to fight inflammation and muscle soreness in the body, it may be

of great use to those involved in an advanced exercise program. If you suffer from any of these conditions you might want to give either oil a try. In any case, for most of us, it's not a bad idea to supplement our diets with GLA. I usually recommend at least 500 mg of GLA daily. That usually translates to six or more capsules of evening primrose oil or three or more capsules of borage seed oil daily (evening primrose oil usually contains just less than half the amount of GLA as borage seed oil).

Fish And Fish Oils

Fish oils belong to the alpha-linolenic omega-3 series of fatty acids and are rich in eicosapentaenoic acid (EPA) as described above. While the body is able to convert alpha-linolenic acid to the longer chained EPA and DHA, it does so slowly. It makes good health sense to use fish oils since they are rich sources of EPA and DHA.

While increasing fat burning capabilities and lessening the amount of fat on the body, fish oils will also aid in limiting the breakdown of muscle tissue and adding muscle tone for increased body shaping. They may also aid in lowering blood cholesterol levels, have vasodilatory effects (widening of the blood vessels), and may be protective[160] and perhaps even therapeutic[161] against certain cancers. EPA also seems to decrease the production of arachidonic acid from DGLA thus decreasing the production of some of the bad prostaglandins.

Fish oil also seems to have significant anti-inflammatory effects and protective effects on joint cartilage especially in arthritic conditions.[162] EPA and DHA seem to have some similar and independent effects on the body. For example, a recent study has found that DHA, rather than EPA is responsible for the anti-inflammatory effects of fish oil.[163]

The best way to obtain fish oil and thus your complement of these very important omega-3's is to regularly eat fresh fatty fish. For example, 100 grams (3.5 ounces) of Atlantic salmon has about 1400 milligrams of omega-3 fatty acids (EPA and DHA). Thus a half-pound of Atlantic salmon will give you an excellent daily complement of omega-3's (equal to or more than 10 capsules of fish oil).

Any fish - be it shell, freshwater, ocean or whatever - contains some omega-3 fatty acids. There is evidence, though, that ocean fish is a better source than freshwater fish (except for lake trout) for omega-3's. Fish from the colder northern waters such as the North Atlantic is superior to that caught near the Equator, and shellfish have lesser amounts of the omega-3's than other fish. Of the commonly available fish, the ones that are highest in omega-3's are salmon, herring, sardines, mackerel, and bluefish. I usually recommend that one or all of these fish be eaten at least three to four times a week.

On the other hand, there is no need to jump overboard on fish or fish oil consumption. In one study, researchers observed no significant associations between higher dietary intakes of fish, or the omega-3 fatty acids fish contained, and the risk of coronary artery disease (CAD).[164] Although men who never ate fish seemed to have a slightly higher risk of CAD than men who ate a small amount, increasing fish intake from one to two servings per week to five to six servings per week did not substantially reduce the risk of CAD among men who are initially free of cardiovascular disease.

Although further studies will have to be done to see if the results of this and other studies are valid, a recent review concluded that fish oil likely has beneficial effects on CAD and myocardial infarction.[165] On the basis of the many studies showing the benefits of fish oil, I recommend that fish or fish oil be used every day if possible or, if not, at least every other day.

If you have problems with eating fish on a regular basis, then I recommend that you use a fish oil supplement such as salmon oil capsules. Generally, I recommend 2,000 milligrams of EPA a day. Fish oil usually contains 20 percent EPA and a lesser amount of DHA so 10 capsules a day of 1,000 milligrams of fish oil should give you the recommended amount. If desired, or if there is a personal or family history of CAD, more fish oil could be consumed, as there appears to be no adverse metabolic effects of long-term fish oil supplementation.[166]

Whatever the amount that you use, be careful to buy fresh fish oil capsules that are in an opaque container. If the capsules are fishy tasting, chances are they're partially rancid and shouldn't be used. Keep the fish oil capsules in the refrigerator and away from light and use them up as soon as possible, at least within a few months of purchase.

Monounsaturated Fats

Monounsaturated fatty acids (oleic acid is the main one that concerns us), are produced by the body and are found in fats of both plant and animal origin. Animal sources of oleic acid are usually found along with saturated fatty acids and include beef, pork, lamb, chicken, turkey, dairy products, eggs, and some fish (like eel and trout). Although the common belief that the fats found in the above foods is all saturated fats, this is not the case. Oleic acid makes up from 20 to 50% of the fats in these foods.

The plant sources include olive, canola (rapeseed), hazelnut, and peanut oils as well as the foods from which these oils are extracted and also almonds, walnuts, avocados, pistachios, and macadamia nuts. As well, many of the foods that contain or are cooked in the above oils have significant levels of oleic acid. This includes fried foods, salad dressings, baked goods and certain soups.

Chapter 6: Monounsaturated and Saturated Fats

Monounsaturated fatty acids, especially oleic acid, seem to have some advantages over other fatty acids. A significant intake of monounsaturated fatty acids won't increase your risk of heart disease and may even decrease it by their effects on total cholesterol, HDL and LDL.[167] The body also seems to have an easier time metabolically handling oleic acid over the other monounsaturated fatty acids.

Canola oil contains erucic acid that may have some toxic effects. As well, because of its method of extraction, canola oil contains some deformed fatty acids. Studies have also shown that, unlike olive oil use that can decrease total cholesterol and LDL, canola oil has no such effect on blood cholesterol.[168]

For various reasons, olive oil seems to be one of the better fats to consume on the Metabolic Diet. But only certain olive oils are candidates. Like any other oil, any heat, chemical, solvents and other refining process ruins the health effect of olive oil. The best olive oil is the cold-pressed extra virgin olive oils since these oils are extracted by the use of gentle pressure rather than with the use of heat and solvents.

There is a body of epidemiological evidence that points to the health effects of olive oil.[169,170] As well, studies have shown that olive oil decreases atherogenesis.[171] Olive oil seems to one of the players responsible for the health effects of the Mediterranean Diet.[172] Additionally, very few pesticides and chemicals are needed to grow olives; therefore, you then have a source of fat that seems to have everything going for it. Olive oil is definitely a useful and necessary part of the Metabolic Diet.

Saturated Fats

Many of the foods recommended in the Metabolic Diet, such as red meat, eggs and cheese and butter contain saturated fats. These fats do have a tendency to raise total serum cholesterol and LDL levels in some individuals, especially those with previous blood cholesterol problems. The increase in total cholesterol is mainly from an increase in LDL although there is also a small increase in HDL.[173]

However, not all saturated fatty acids have an adverse effect on total cholesterol. For example, stearic acid (the main saturated fatty acid found in beef) and medium chain saturated fatty acids have little or no effect on total cholesterol. Recent studies have shown that replacement of carbohydrates with stearic acid (as is done to some extent in the high-fat, low-carb phase of the Metabolic Diet) has little effect on lipid and lipoprotein concentrations in plasma.[174,175] As well, in these studies oleic and linoleic acids had beneficial effects on blood lipids by raising HDL and lowering LDL.

It's important to realize that recent research has shown that it is the oxidized forms of cholesterol and LDL that increase the incidence of cardiovascular disease (CVD) including CAD.[176] Thus, factors that decrease the tendency of LDL to oxidize (such as the use of monosaturated and marine oils) can negate any harmful effects a higher-fat diet may have on CVD. As well, natural saturated fats do not have the toxic harmful effects seen with the use of trans fatty acids. They are mainly an effective and compact source of energy. Most of us have no real problem with these saturated fats - our bodies know how to deal with them.

Saturated fats are an integral part of the Metabolic Diet. If used properly, natural saturated fats will help you to lose weight and body fat. Any adverse effects that they might have on those susceptible to cholesterol problems are usually diminished by the fact that the dietary as well as the body's saturated fats are used as a primary source of energy, and therefore don't have a chance to do any harm. As well, other recommended fats can decrease or eliminate any adverse changes of the Metabolic Diet to total cholesterol, HDL and LDL.

Butter Or Margarine?

Lately, the marketing of low trans fatty acid margarines has confused the issue of whether you should use margarine or butter, or neither. At the heart of this debate is trans fatty acids, a type of fat found in margarine and many processed and fast foods. At one time, trans fatty acids were thought to be better for you than saturated fat in butter. But some studies have found that trans fatty acids may be as harmful to your health as saturated fat and possibly worse. So does this mean you should switch back to butter? Most health experts say no. But they do recommend limiting trans fat in your diet.

But when you want to use butter or margarine, which is better? Most health experts say margarine, particularly the tub and squeeze-bottle kinds, which are more liquid. They usually contain less trans fat than do stick margarines. In addition, some manufacturers have developed margarine spreads and sticks that contain no trans fat. As is often the case, the key is moderation.

Be Wise With Fats

- **Eat fewer processed baked goods and fried foods, especially fast foods.**
- **Bake, boil, microwave, poach or steam foods instead of frying them.**
- **Buy oils that are predominantly monounsaturated (olive or canola oils).**
- **Consume only fresh oils.**

Chapter 6: Be Wise With Fats

How Much And What Kind Of Fats Do We Eat

In a diet where fat plays the key role as it does in the Metabolic Diet, it's important to get a handle on just what kind of fats you should be looking for and in what proportion they should be eaten.

Taking into consideration everything we've just said about fats, the following guidelines will make the Metabolic Diet healthier and more effective. Twenty-five percent of your fat intake should come from olive oil and the EFA-rich foods mentioned above. These include nuts, seeds, fish, flaxseed oil, salmon oil, and unprocessed vegetable oils. The other 75 percent of your fat intake should come from high quality meats, chicken, eggs, cheese, pork, butter, shell and other fish and associated foods. Also, make an effort to use the omega-3 enriched eggs and dairy products. Table 1 provides an easy way to judge the various fats in some common foods and oils.

TABLE 1: **Fatty Acid Composition Of Commonly Consumed Foods**
(as % of total fatty acids)

Food	**Saturated**	**Monounsaturated**	**Polyunsaturated**
Butter, Cream, Milk	65	30	05
Beef	46	48	06
Bacon and pork	38	50	12
Lard	42	45	13
Chicken	33	39	28
Fish	29	31	40
Coconut oil	92	06	02
Palm kernel oil	86	12	02
Cocoa butter	63	34	03
Olive oil	15	76	09
Peanut oil	20	48	32
Cottonseed oil	27	20	53
Soybean oil	16	24	60
Corn oil	13	26	61
Sunflower seed oil	11	22	67
Safflower seed oil	10	13	77

You should do your best to avoid the "bad fats" listed previously. Margarine (because of its trans fatty acid content) and commercial processed vegetable oils are a no-no. Hydrogenated oil products and shortening, which are found in almost every processed food, should also be avoided.

In fact, any kind of oil that has been around for a while should be suspect, even fish oils. If they've been stored too long, there's a good chance they've oxidized to some extent and can cause free radical damage in the body. As well, they likely contain altered fatty acid derivatives that are harmful to your health.

Bottom line is you should supplement your diet with GLA-containing oils (such as evening primrose or borage seed oils), unspoiled fish oil (if your intake of fish is lacking) and to a lesser extent flaxseed oils as discussed previously. You should make liberal use of extra virgin olive oil for preparing foods, salads, protein drinks and in any other way that you find palatable.

Reading Between The Lines On Labels

How can you tell if a food product contains trans fat? When it comes to listing fat on food labels, manufacturers are required to only list total fat and saturated fat. Some also voluntarily list monounsaturated and polyunsaturated fat, but it's unlikely you'll see trans fat listed.

However, the Food and Drug Administration is proposing that the amount of trans fatty acids in a food be included in the nutrition facts panel on labels. Still, you may be able to tell if a product contains trans fat, even if it's not directly listed on the food label. Look for the words "hydrogenated" or "partially hydrogenated" in the list of ingredients. These terms indicate that the product contains trans fat. However, you won't be able to tell how much trans fat is included.

If you want to learn more about good fats and bad fats and the effects they can have on your health, then I recommend you read *Fats that Heal Fats that Kill* by Udo Erasmus, published by alive Books (7436 Fraser Park Drive, Burnaby, BC, Canada, V5J 5B9). This book, while being almost encyclopedic in scope, is easy to read and understand

Chapter 7

The Mental Edge

The Mental Edge

In this chapter I'd like to talk about the psychological approach to losing weight, keeping it off and creating the body you want. The key is in learning about our personal relationship with the society we live in.

So many of our dietary habits are based on social convention, tradition and fashion. The act of "eating" itself has always been a social one. Mealtime can be the focus of our most important social and family gatherings of the day. "Breaking bread" with somebody else is often the key to establishing a relationship with him or her.

At the same time, many of the perceptions we have of our own value are based on how we look and the way society judges how we look. Unfortunately, the message our "plugged in" society often gives is a contradictory one.

In the age of electronic media in a capitalist society, the message is predominantly shaped by commercial considerations. We're often being told that to be an accepted part of the society we must do the impossible. While "thin" is almost always "in" we're bombarded with commercial messages telling us to eat at fast food franchises, drink beer, eat processed foods and do a variety of things that make staying thin a very remote prospect.

On the one hand, we're being told to be disciplined and do the things necessary to become a virtual rail. On the other hand, we're being told that we "deserve a break today" or should "give in to the guilt" and partake indiscriminately of the dietary riches around us. It's really quite insane and, with the reliance of our impressionable youth on television and modern commercial media, it's no wonder bulimia, anorexia, obesity and other disorders have become so prevalent among our youth.

To lose weight and keep it off, you're going to have to make some kind of peace with yourself and society. You're going to have to examine society and your role in it and figure out how to best deal with all the mixed messages. Your psychological approach to your diet will be just as important to your success as the components of the diet itself.

How to Create an Attitude for Dieting Success

Most experts consider over 20 percent of the recommended weight to represent obesity. Recent estimates indicate that up to 40 percent of the adult population can be placed in this category. Many more reside in the range between their ideal weight and obesity levels.

This is a huge segment of our population and it's certain that most people, especially those in the obese category, suffer considerable emotional and physical problems as a result. The list of physical disorders related to obesity is long. Non-insulin-dependent diabetes tops this list. Diseases of affluence, such as hypertension (high blood pressure), soaring cholesterol and triglyceride levels, coronary heart disease, glandular dysfunction, respiratory problems, gall bladder inflammation and gallstones, osteoarthritis and certain cancers including breast, uterus, colon and prostate cancers have been linked to obesity in research studies.

And the problems don't stop there. Being overweight can have crippling psychological and social effects as well. Society at large has little tolerance for the overweight. Though the causes for being overweight are numerous and complex, society continues to see obesity as a single disease resulting from character defect, lack of self-control and gluttony. In a society where thin is worshipped, those who aren't thin are made to feel of less value.

Depression and anxiety often result; self-esteem is lost. Spouses and friends may not take you seriously. Being overweight may even affect the type of education or job that you do. Overweight people can be discriminated against. Jobs can be denied and, even when hired, the overweight person can be denied promotion or raises.

This discrimination is even carried over to health care possibly resulting in a lower standard of care. If a thin person and obese person complains of tiredness, shortness of breath, joint pain, bowel irregularity or back pain the thin person is much more likely to be fully examined and have the cause for these problems investigated. The obese person is often told the problems they suffer from likely result from excessive weight or the diet medication they may be on.

Chronic dieting by many overweight people can further erode confidence. Those who can't lose weight and maintain those losses - and this includes most overweight people - suffer from feelings of inadequacy and guilt. They may come to view themselves as failures, regardless of how successful they may be in other parts of their life.

As social beings, we are very much affected by the feelings and opinions of those around us. This is especially true for women whose worth in society, especially from the male perspective, is far too often determined by appearance. Most people link their feelings of self-worth to what others think of them and, for the overweight, this can be devastating. Many have been dealing with feelings of inferiority and lack of self-worth since their childhood years. To best achieve weight loss and stick to a diet, even one as simple and painless as the Metabolic Diet, a successful mental approach to your efforts will be necessary. Below I've supplied 11 suggestions for creating a personal climate for diet success that will aid you greatly in losing your weight and shaping the body you desire.

Chapter 7: Focus On Your Expectations

1. **Focus On Your Expectations**

Those who have their self-esteem tied to what others think of them are going to be very vulnerable to the whims of others. Unfortunately, in our competitive, capitalist society we also have a tendency to define our worth in relation to others and when that "other" is looking to find a way to feel better about her own life it may come at your expense. As such, their criticism of you may indicate little more than their own feelings of inadequacy.

When you rely on others for self-esteem you're often going to be disappointed. Many overweight people have become conditioned to the criticism and live life expecting pain and lack of success. Their failure to lose weight can become something of a self-fulfilling prophecy.

Before you lose weight and keep it off, you're going to have to reshape your thinking. Try to rid yourself of other people's expectations and learn to trust and strive for your own goals and define your life by your standards. This involves setting realistic goals for yourself and giving yourself proper credit when you meet them.

2. **Realize You Deserve To Be Happy**

You haven't done any injustice to humanity. In fact, as discussed above, the weight problem you suffer probably comes as a result of a sluggish metabolism or genetic factors. You don't need to feel guilty about anything. You're just going to have to work harder and be more dedicated than the next person to achieve a working level of fitness. We're not all born with the same abilities or physical gifts. But we all do have the right to strive for happiness. You have a right to be happy and rid yourself of those feelings of inadequacy, anxiety and worthlessness that may have been instilled in you.

Once you decide that you deserve to be happy, then it's time to do the things necessary to achieve success. You are your own master. You run your own life and make decisions on what you need, not what somebody else thinks you need. With a program like the Metabolic Diet you can lose that weight. You'll be able to say "no" when you need to say "no" and not feel guilty. And, as you find yourself creating the kind of body you want, you'll find your self-worth increasing.

If you blow your diet on occasion, you won't feel like a total failure and give up on it. Indeed, on the Metabolic Diet you'll find that the occasional lapse won't harm you at all. You may even celebrate the fact those experiences that previously caused you to think of defeat are now nothing more than an annoyance.

By living up to your own expectations and avoiding the resentment based on other's expectations and your fear of failure, you'll find yourself energized and motivated. You deserve to be happy, live the life you want to and make the changes you need to be happy and healthy.

3. **Build On Your Own Momentum**

Nothing contributes to success as much as success. You can compensate for your initial lack of self-esteem or confidence by using those early losses to energize you toward future success. Celebrate those early losses and take pride in them. You've begun to achieve the goals you've set for yourself. As you begin to look better, you'll also find your self-image changing for the positive and realize that you can take charge of your life and achieve the things you want to. Build on your success.

4. **Provide Full Motivation**

Motivation is the mechanism for transforming desire into reality. Weight loss and fitness require focus. You can't just give it half an effort. Use your successes to cheer yourself on while keeping those long-term goals and that picture of the body you're striving for in your mind. If you intensely desire to lose weight and use a proven program like the Metabolic Diet, you've got a very good chance of doing so. Having expectations based on your personal needs and realizing that you deserve to be happy will insure positive results.

5. **Learn To Deal With Stress**

Stress can play a major role in the inability to lose weight and build a healthy body. Surrendering to it can lead to self-destructive behavior. Unfortunately, in our modern lifestyle, stress is almost impossible to avoid. It's not so much the stress, but how we react to stress that presents the biggest problem.

Anger is often directed inward, especially by those who have long-standing weight problems. This self-absorbed anger can ultimately lead to an apathetic attitude and leave a person resigned to failure. Try not to internalize your anger and let it eat you up inside.

Out of their own feelings of unworthiness, the obese person can often falsely feel that they are responsible for anything and everyone and take the world and its entire population on their shoulders. Taking responsibility for the moods of others is a big mistake. This can leave you feeling tense and guilty and lead to further loss of self-esteem and destructive behavior. Also realize that, while the roots of anger can be buried and long-standing, some anger is based on superficial concerns and can be constructively dealt with.

6. **Watch Out For Saboteurs**

At one time or another you're going to run into people who, consciously or unconsciously, try to sabotage your diet. You've heard the phrases before- "But I bought them just for you," "You can make it up tomorrow," "I like a little meat on your bones," "A little bit won't hurt you," "Eat! You're going to get sick," “Not another diet!" In many cases, the person making these statements may be doing so without any awareness of the implications of their actions.

The only solution is to be your own person. You're the boss. You're responsible for your diet and you must make the decisions and conduct yourself accordingly. Don't let someone else make them for you.

You'll also frequently find cases where a husband or wife will nag the dieter in an attempt to destroy their diet. Perhaps they feel that a thinner spouse will be more attractive to the competition. Insecurity, which may have been hidden while the mate was overweight, can grow stronger with each pound their partner loses. Talk with your spouse, reassure them and do your best to get them to join you in enjoying your new body.

7. **Don't Be Afraid To Improve Yourself**

When you're overweight, there is no need to compete with other people. Many feel that it takes the pressure of having to look good off them. It may play havoc on your self-concept, but it sure is easy. No more watching calories or food and you just avoid the mirror. What could be simpler?

In fact, many overweight people are afraid to lose weight. They fear the world will change and that more will be expected of them. Even among those people who lose weight, there can be strong resentment. Even though they haven't changed inside, they suddenly find themselves more accepted, more desirable as a mate. This change in the people around him or her can create anger at everyone and at a society that judges people so superficially.

I agree; people are judged on silly grounds. Appearance takes precedence over personality. For a personality to be appreciated, you've got to get past the way a person looks first. Many great personalities go undiscovered merely because the body they're packaged in doesn't appear to suggest worth.

It's not fair, but in our society it helps to pay attention to appearances. It's far better to deal with this reality than to spend your life unhappy and bitter. Improving your appearance can open up a whole new world and aid you in becoming a more positive, successful person. While more may be expected of you, you'll also find yourself capable of delivering it.

8. **Understand That Weight Loss Is Not A Panacea**

While weight loss can change your life, you shouldn't expect it to be the solution to all of your problems. Some people go on a diet and expect it to cure all their ills. This is unrealistic and will lead to regaining weight because of the discouragement and frustration that results from being unable to lead the perfect life.

Long-term changes in your life will come from the decisions you make about yourself and your lifestyle, not the diet itself or change in appearance. While the diet may give you an entirely new look, you'll still be the same person inside. Lasting weight control usually comes from dedication and personal growth rather than the other way around.

9. **Make Necessary Lifestyle Changes**

Examine your daily routine. What's wrong with it? What's right with it? What makes you feel uncomfortable? What gives you a lift and makes you feel good about yourself? Why?

Try to put together a profile of the positive and negative people and forces in your life. From this profile, you can see what things need to be changed. Make changes that will increase your feeling of self-worth such as making time to relax and exercise or minimizing your time with troublesome people and situations. Identify sources for anxiety and work to consciously and productively deal with them with a view to your own right to happiness and respect for your own needs and standards.

To maintain weight loss, you're going to have to identify those things that make you slip off the track to success and minimize their effects. A good weight loss program involves not only a well-planned diet but also the kind of psychological approach that will keep you from sabotaging yourself and denying your own happiness and success.

10. **Accept Responsibility For The Things You Do**

No one else can take that responsibility and no one else is to blame if you can't. Accept yourself as you are and take responsibility for it. Forget what the others say.

In order to lose weight, shape a new body and maintain it, you must monitor yourself constantly and be aware how behavior and habits can affect your weight. If you go off the diet, it'll be because you wanted to. If you stay on it, it will be because you decided it was important. Take pride in your progress. You're the one responsible for it.

Chapter 7: Realize That You're Not Alone

11. Realize That You're Not Alone

Though the ultimate responsibility for your weight rests with you, having the support of spouse and friends can make losing weight much easier. It's important that they be supportive. It's helpful to have someone to lean on. Someone to call when the going gets rough.

In fact, it can be helpful to have friends or family diet with you. This will not only give you a support system but also make a positive impact on their eating behavior. Your need to lose weight may turn out to be the best thing that ever happened to them if they get their habits in order as a result.

This can be tricky, though. You need to be considerate of each other. Make mutual goals but don't compete with each other directly. Don't make it a contest to see who can lose the most the fastest. It's not competition but cooperation that rules here. Don't harbor bad feelings or jealousy. If you're a woman and your partner a man, understand that he is more likely to lose weight faster than you and will probably be eating more calories at the same time due to metabolic and biological differences between the sexes.

Get together often and talk about your diet techniques and any problems you're having. Support each other when you falter. Plan a regular exercise program together (having a good training partner can spell the difference between a successful exercise program and one that dies on the launch pad). Never criticize your partner. Instead, make helpful suggestions when asked.

A Key To Success

Many diet groups and diet plans attempt to use sweeping behavioral change to help the overweight person lose weight. In trying to distract you from food, the food can become an all-consuming obsession. I believe in behavior modification, but only when changes focus on aspects of your environment that are responsible for eating behavior. Only by learning about them and how they impact your approach to food will you be able to modify them to help you lose weight.

The first step is monitoring your daily food intake. Before you begin the diet, do a three-day audit on your eating habits. At what times do you eat? When are you most likely to overindulge? Do you eat more when you watch TV or read? When a certain person is around? When you're under stress? What kinds of foods are you eating and how much? This will give you a good overview of any problem areas that may need to be watched when you begin your diet.

Being aware of how you eat can help you obtain an excellent overview of factors that contribute to eating too much and what measures to adopt to control them. Below are nine quick questions you may want to answer before you begin your diet.

1. **How Quickly Are You Eating?**

If you're the kind of person who gobbles down their food when they eat, you should realize you're doing yourself an injustice. Not only are you denying yourself full enjoyment of the food you're eating, but research has shown that bolting food keeps the body from recognizing "satiety signals" that let you know you've eaten enough, are no longer hungry and should stop. It takes time for the brain to get the signal that you're full, usually 15-20 minutes.

If you eat more slowly, your body will tell you when you're full and your hunger will be more accurately assessed. Start your meals with a glass of water. If necessary, put your fork down after each mouthful to allow more time for chewing.

2. **What Do You Do When You Eat?**

Do you watch TV? Read? Both these activities can make eating an entirely unconscious activity leading to the situation above where you're unable to read the signals your body sends telling you when you've had enough. Getting together with the family, roommates or friends at the dinner table and socializing can have as many physical advantages for the dieter as social.

Using smaller plates and filling them up is one way to keep yourself from eating those extra helpings. Once you've served yourself, put food away so you're not tempted to make a return engagement.

3. **Are You Eating With A Saboteur?**

Above we talk about "saboteurs": people who may, either consciously or unconsciously, try to get you off your diet. If you find yourself with a dinner date that's constantly trying to load you up with foods you don't want, you may want to make a change. The same applies to someone who may be critical of your diet or unsupportive around the dinner table.

4. **When Do You Eat?**

If you find yourself eating at 7 A.M., noon and 6 P.M. whether you're hungry or not you're probably doing yourself a disservice. You should eat when you're hungry, not by the clock. This may mean adjusting your meal schedule to eating at different times or simply eating several small meals during the day at times when hunger strikes as discussed earlier. If possible, you may want to change your lunch hour at work or snack briefly during the workday so you can eat when your stomach tells you to.

5. **Do You Leave Food Out In The Open?**

Many people leave caches of snacks, candy and food throughout the house. Chances are, if it's out, you're going to be tempted to eat it. Make sure these snacks are foods that fit within the confines of your diet or, even better, put them away.

6. **When Do You Shop?**

Do you shop for food when hungry or tired? This can be a mistake. You can find yourself succumbing to temptation and buying foods that aren't scheduled for your diet.

On the Metabolic Diet, I'd suggest buying food for the upcoming week on Sunday and holding off buying of food for the weekend until Friday. Don't even have those restricted foods around the house until they're scheduled. It also makes sense not to buy those weekend foods in bulk. You may end up spending more money and having to make more trips to the store, but your diet will be much easier to follow.

7. **How Do You Cook?**

Do you do taste tests while you're preparing food? If you're watching your food intake, realize that you may be adding hundreds of uncounted calories to your diet this way. Just follow the recipes. Get someone else to taste for you if necessary.

8. **Are You Eating Compulsively?**

Many people eat as a way of dealing with anxiety. Once stress rears its ugly head, they're on their way to the refrigerator. Several studies have shown that overweight people are more responsive to emotional stimuli and that anxiety is frequently associated with increased food intake. Try to deal with stress by using relaxation, exercise or another positive approach. While food may trigger a hormonal response to make you feel better over the short term, eating to cope with anxiety can only be destructive and unhealthy over the long run.

9. **Are You Trying To Fix Everything At Once?**

It is very important that the dieter not try to fix everything in their life all at once. To try to lose weight, stop drinking or smoking, change jobs, etc. all at the same time will probably doom your diet to failure. Small successes often pave the way for greater successes. Stick with the diet for a while. Concentrate solely on it. Then, when you've achieved some success and feel comfortable with your diet, you can begin to work of other self-improvement projects.

Eating Out

I have a friend who's been on the Metabolic Diet for several years now. He keeps his carbs really low because it works best for him. Frequently we go out to eat together during the week and he's got the right approach down to a fine art. He looks the waiter in the eye and says, "I want a T-bone steak and nothing else!" Most often the waiter will look at him and say, "But you get a baked potato, vegetables, bread . . ."; "And nothing else" he breaks in and repeats. Waiters may have a little difficulty understanding this at first, but usually, with repetition, the point will sink in.

The fact is that my friend wisely doesn't want the extras on his plate. He doesn't need the temptation. The meat is fine by him. He feels great, sticks to his diet and feels good when he's through. If he eats that potato, bread and coleslaw, he won't. Order what you want regardless of what the waiter says. If he tries to tell you that you're wasting your money, tell him he's wasting his time.

During the week, you should be staying away from those carbohydrate foods so keep them out of sight and out of mind. Leave them off your plate; otherwise, you might be tempted to "sample" them.

On the weekend, everything is different. All that bread, potato and salad are fair game. Depending on how you've got your diet structured, you can order them twice. Just keep them off your plate during the week.

Chapter 8

The Metabolic Diet Exercise Program

Chapter 8: Exercise and The Metabolic Diet

Exercise and The Metabolic Diet

Before we begin let me first say that no other diet works as well as the Metabolic Diet for burning up body fat while exercising. Studies have shown that fat breakdown (lipolysis) is higher in people who have low levels of insulin.[177] Fat feeding such as in the higher-fat/low-carb phase of the Metabolic Diet has been shown to decrease serum insulin, increase lipolysis and increase plasma concentrations of FFA.[178] As well, growth hormone levels (important for fat burning) while at rest and exercising are also increased on a higher-fat/lower-carb diet such as the Metabolic Diet.[179] The net result is that while on the Metabolic Diet fat is burned off faster than with any other diet!

If you want to learn more about exercise metabolism and the effect of dietary fat on fat burning I suggest you read *Exercise Metabolism* edited by Mark Hargreaves and published by Human Kinetics (Post Office Box 5076, Champaign, IL, USA 61825-5076).

Beyond The Exercise Prescription

Exercise should be a part of everyone's daily lifestyle. This is especially true if you're overweight. Unfortunately, exercise is often a very low priority in the life of people who are overweight. I know, many people find it tough to exercise and they have any number of reasons for not doing it. But the fact is that regular exercise is a very important part of losing weight. No matter how much you have to lose, exercise should be a part of your weight loss program.

The problem with exercising is that once you've put on the pounds, it can be hard to get into regular exercise. You're often too self-conscious to be seen at a gym or pool or out walking or jogging. Fortunately, there are many facilities where you don't have to feel like you don't fit in just because you don't have "buns of steel". I've set up my fitness facility in a way that no one needs to feel self-conscious and, as a result, people at a wide range of fitness levels feel comfortable there. Competition is not the key; self-improvement is.

The alternative to working out at a gym is to pick exercises you can do in the privacy of your home. Many people take this route. Many people also fail when taking it. Home exercise is often so repetitive and uninteresting that you end up abandoning it out of pure boredom. Many of the exercises you can do in your home are also so comfortable and easy as to be of very little use. They may loosen you up a bit but they're not going to help you lose weight. On the other hand, some of the home varieties of exercise may be a bit too much. Following an exercise program on TV or video can lead to injuries and overexertion. Keeping up with thinner training partners can also be frustrating. What often happens is that the overweight person finds that they can't keep up with a video or neighbor and completely gives up on exercise.

I recommend that you join a gym to get your exercise. There you can perform a superior workout with the right equipment. It can provide an excellent atmosphere and you'll find that you can get as fond of your regular workout as you can a 'Double Whopper with cheese'. Personal trainers are often available for a small charge and they can teach you how to properly use equipment and oversee your progress.

There are a variety of gyms that appeal to a wide range of fitness levels. You may want to visit several gyms in your area to see which is best for you. If it looks like a meat rack, you'll know you don't want to join. But if you see people at varying levels of fitness working out and enjoying themselves, you'll know this is the kind of place you can feel comfortable with. There are many people out there just like you. Gym owners realize this and are increasingly designing their businesses to appeal to them.

Also realize that there are peak times for gym usage in most areas. Early morning and late afternoon times, before and after work, can find the gym packed. But other times, before or after lunch for instance, can find the gym almost deserted. If you want to exercise in peace and quiet, you can often do this merely by adjusting your schedule to use the gym at less than peak times. Again, check a prospective gym out and talk to the people who work there to see if such opportunities are available.

Bottom line, exercise should be an important part of any weight loss program. Too bad so many people have gotten the wrong idea about fitness and exercise. They're often intimidated by the prospect of "getting in shape". The truth is that anyone can get in shape.

Attitude is essential here. Start easy and build up slowly. If you have a large amount of weight to lose and aren't quite ready to join a gym, spend a few weeks walking or performing exercise that is easier and enjoyable. Any exercise done on a regular basis will help you lose weight and maintain your new weight. Next to a sensible approach to diet, exercise is the most powerful tool you have to attain the body you want.

Exercise also provides other dividends that will lead to good health. It strengthens your muscles, bones, ligaments and joints. It will also help prevent osteoporosis, a loss of bone tissue that is especially destructive to women who are past menopause. Exercise also aids mental alertness.

Exercise training can favorably modify many of the conditions that are associated with an increased risk of coronary artery disease, including hypercholesterolemia, elevated blood pressure, glucose intolerance, certain traits of hypertriglyceridemia, obesity, hyperinsulinemia, and psychic stress.[180]

Most importantly for the Metabolic Diet, exercise helps to optimize blood fats (lowering total cholesterol, LDL and triglycerides, and increasing HDL[181]) and maximizes the fat burning and body shaping potential of the diet. If you're going to get the full benefits of the Metabolic Diet, exercise is essential. Having read the low-carb literature and the medical journal literature, I have found a cutting-edge gauge of cardiac risk from easily available numbers to be triglyceride/HDL ratio. The higher the HDL and the lower the triglycerides, the lower your cardiac risk.

Burning Calories

The most obvious effect of exercise is that it burns extra calories that would otherwise return to the body in the form of fat. Unfortunately, exercise doesn't burn as many calories as some people think. Running, swimming or bicycling vigorously for a half hour may burn off 400 calories or so. Running a brisk mile (in under eight minutes) only burns off a few hundred. But it's not really the short-term calorie burning that is important.

It's the long-term effects of exercise that are especially helpful to the dieter. For example, running 2-3 miles a day could decrease your bodyweight by as much as 25 pounds in a year. Thus, while each running session may only help you lose a few ounces, a year of running can make a considerable difference in your weight.

Exercise is also important in raising your basal metabolic rate (BMR), the amount of energy needed for basic functions. Increasing your BMR is very important in burning off calories and enabling weight loss. Your body works much as a furnace. It consumes food to produce the energy necessary to keep your body warm, organs functioning (heart, lungs, liver, kidneys) and your tissues alive.

As discussed earlier, people vary widely in the amount of energy necessary to keep going. Some people burn calories freely while others, often those who are overweight, have a tendency to conserve energy and burn far less for basic functioning. Those people who waste energy and are less efficient in burning fuel (like an inefficient furnace wastes fuel) have a higher BMR. Having a high BMR, and burning all that fuel, aids in making you a thin person.

A low BMR, on the other hand, leads to using calories frugally. Energy is spent very efficiently and the rest is stored as fat. In humankind's early days, this was an excellent trait to possess. It meant that you were fuel-efficient and had a much greater ability to survive periods of food shortage or starvation. Unfortunately, in today's modern world there is generally enough food available so starvation is not a possibility. That low BMR leads to little more than laying down fat on the body.

Often, BMR will decrease as a response to dieting. The body sees starvation as a possibility so it begins to burn fuel more efficiently as a way of maximizing energy reserves. Exercise increases BMR, both during and after exercise takes place. In fact, BMR may remain increased several hours after an intense exercise session that leads to enhanced burning of calories.

Research has shown exercise as having far more than short-term effects on both energy expended by the body and fat-burning metabolism. Intense exercise (especially weight training) can stimulate the increased expenditure of energy and lipid (fat) oxidation for up to 17 hours after the exercise itself.[182] The ultimate impact on the reduction of body fat can be major and long lasting. Regular exercise has also been shown in many studies to sustain changes in the body's hormonal levels that also aids in long-term weight loss, especially when combined with a diet like ours.

Decreasing Appetite And Increasing Feelings Of Well-Being

Along with increasing the amount of calories you burn for energy, exercise provides many other advantages for the dieter. For instance, exercising at a moderate level of effort has been shown to decrease food intake by decreasing appetite. While you might expect that appetite would increase as a result of working out, the exact opposite is true. Though this effect seems to be felt strongest in men, women can also benefit greatly from the decrease in appetite that accompanies an exercise program.

Regular exercise also makes you feel good. Endorphins and enkephalins, the body's natural painkillers, are stimulated by exercise. This provides a feeling of immediate well being that can aid you in resisting any temptation. In addition, the mere act of exercise is a positive step in taking control of your lifestyle that will find you feeling good about yourself. When you feel good and in control, you'll have far less trouble sticking to a diet.

You'll also find that the combination of diet and exercise results in losing more fat and less muscle than you'd see when losing the same weight just by dieting. Exercise minimizes the loss of lean muscle mass that can come with dieting and it also appears to have a sparing effect on the muscles of the heart. These effects are increased on the Metabolic Diet.

Retaining and building more muscle for enhanced body shape and tone will also make it easier to maintain your weight. Muscle, pound for pound, burns more calories than fat. This is especially true during exercise. Muscle is also less efficient than fat in retaining body heat, thus leading to increased caloric use for body heating. In fact, your metabolic rate is partially dependent on the amount of muscle you have on your body compared to fat. The more fat you have in relation to muscle, the lower your metabolic rate will be. The message here: if you want to increase BMR and lose even more body fat, increase the amount of muscle you have through exercise and the proper diet.

Chapter 8: What Kind Of Exercise Should I Do?

Precautions

You should get your doctor's OK before beginning any strenuous exercise program. This will be easy for those of you who are already seeing a physician for weight loss or plan on consulting with one. It's important to remember that even if you have formidable existing health problems like heart disease, high blood pressure, arthritis or diabetes there is always some form of exercise that you can do. People who are physically incapacitated in some way, such as severe arthritis or other musculoskeletal problems, for instance, often utilize swimming.

Exercise also strengthens the heart and prevents the heart muscle from wasting away. During prolonged fasts (as in anorexia nervosa) the loss of cardiac muscle can be significant. In some cases, it can even be fatal.

What Kind Of Exercise Should I Do?

Most importantly, you should think of your life in terms of activity potential and try to stay as active as possible. Sitting is preferable to lying down. Walking is preferable to sitting. Any kind of exercise is preferable to none at all.

Walk instead of driving the car. Take the stairs instead of the elevator. Push the lawn mower instead of riding it. Whenever possible, take a more active approach to transportation or chores. For some, especially men, this in itself can be enough to achieve a desired weight loss. But for most of us, more will be required. The best exercises for losing weight are those that work your heart, lungs and muscle.

Walking

Walking is the most basic exercise you can get. For some people, this may be all their doctor will allow. This is how heart patients often begin their comeback from a heart attack or associated incident. If done briskly and on a regular basis, walking can be an effective exercise both for weight loss and improving fitness.

There are several practical advantages to walking, too. You don't need special equipment (other than good shoes), it rarely causes injuries and you can walk practically anytime and anywhere. The only problem is that walking has only minimal impact on fitness and provides minimal benefits when compared to other forms of exercise. If you can do more, you should.

Running

Although an excellent exercise, running may not be suitable for overweight people. If you know any runners, you know that they can sustain a number of injuries. Overweight runners are especially susceptible to the injuries that can result from the stress of pounding pavement.

The joints and muscles most often involved are those in the back, hip, knee, ankle and foot. Injuries in these areas can be considerably painful and nagging. They can also put a damper on any exercise program.

As well, running is not a good conditioning exercise for the upper body. Only the skeletal muscles of the hips and legs receive a good workout. You'll note that runners possess upper torsos that are less than flattering. The goal of the Metabolic Diet is to help you lose weight and get an attractive body. Running, of and by itself, is not going to get you that.

Running also becomes very difficult in the Northern climates during the winter. Along with being hard to run in a snow or rainstorm, winter conditions can also make injury more likely. Running on one of the more sophisticated treadmills in some gyms, because of the way they are constructed, decreases the musculoskeletal trauma and the likelihood of injury. As well, the activity can be combined with other exercises to provide a more balanced workout.

Cycling

Cycling has many of the same limitations as running although injuries aren't as frequent. As for stationary cycling, while convenient, it can be very boring and people often give up on it very quickly, especially at home. But it does have advantages for those who are very obese or have back problems or arthritis. You can also do it in the privacy of your home and at your own pace. As such, it can be very good for people who are too embarrassed to be seen exercising by others. Once you lose some weight and feel more comfortable, you can substitute or add other exercises, or do your cycling as part of an overall program either at home or at a fitness facility.

Swimming

Swimming exercises most of the major muscle groups in the body and is an activity that can be performed by virtually anyone. Even those with heart or joint problems can enjoy swimming. Unfortunately, if overweight, the prospect of donning a swimsuit can be a bit intimidating. Swimming also doesn't provide the kind of tone that most people are searching for when reshaping their body. If swimming makes up a good part of your exercise program, make sure you do it as consistently and vigorously as your physical condition allows.

If you're knowledgeable and motivated, you'll probably be able to exercise on your own and do well. For most people, though, working out with others and under supervision is the best way to go. Enthusiasm stays high, there's much more variety, and you're not as likely to miss workouts. Join a group or enlist the aid of a trainer where possible to ensure your continued attendance.

Weightlifting

No doubt, many of you may be turned off by weightlifting or bodybuilding. You see those big competitions on the sports channels or pick up the magazines at the market and end up thinking that bodybuilding is only for a select group dedicated to building their bodies to superhuman levels.

The fact is that weightlifting can be an ideal exercise for losing weight. With overall fitness and shape in mind, it can enhance both the male and female physique. You don't have to end up looking like Mr. or Ms. Olympia.

By using a process called "aerobic bodybuilding" we can combine the best of both the aerobic exercise and weightlifting worlds. You can develop both cardiovascular health and shape your body to the level you want. If you want more musculature, you can do that. If you want less and are just looking for toning, that's also possible. Whatever your goals, a properly designed weightlifting program can deliver results. Aerobic bodybuilding also exercises all the major muscle groups so you don't end up lacking shape in critical, visible areas.

The benefits of weight training are many. You get that feeling of well-being common to people who are gaining some strength and improving their bodies. Musculoskeletal disorders, such as low back pain, tennis elbow, and even arthritis can be improved. You'll retain the body tone that others lose when they go on a diet. You lose less protein and more fat. Indeed, no other form of exercise offers so much.

Many women shy away from weightlifting because they're afraid of appearing muscular and unfeminine. They needn't worry because the female body will retain its female contours, except in extreme cases. Even when a good degree of muscularity is added, a woman's natural fat layer rounds out the muscle and preserves natural curves. For most, this will not be an issue because their goals will be more toward shaping and toning. They will find their bodies actually becoming more attractive in a feminine sense. You don't have to be afraid of muscle. It's good for you and, with a proper weight program, you can get exactly the kind of body you want.

Aerobics

Low impact aerobic exercise, like aerobic dancing, jazz dancing and dancercise has become the exercise of choice for many who want to lose weight. Seniors and others who may be predisposed to hip, knee and ankle problems have also benefited from low-impact aerobics. In fact, any of the rhythmic movement programs set to almost any kind of music will get you results.

But while any aerobic exercise is good for cardiorespiratory fitness, it may not be the best for body toning and shaping. Some of the more advanced types of aerobics also run the danger of overtaxing the cardiorespiratory system.

Trying to follow an overenthusiastic instructor can be difficult both physically and psychologically. For those who have a bigger weight problem or possess poor cardiorespiratory fitness, these kinds of aerobics may be a big mistake.

Progress should always be carefully graded in any exercise program. These aerobic programs are often rigid and don't lend themselves to the kind of careful planning and supervision that should go into them. These programs also have a tendency to stay the same week after week and that can lead to lack of progress and a boredom that may dampen enthusiasm for exercise.

An exercise program should be varied and lively in nature. It should be geared for change as needed to meet changing goals and levels of fitness. One of the good things about training in a gym is that you'll generally have a fitness professional available to help guide you and make changes as necessary. Many of these aerobic programs are programmed to become stale. And, if you properly view weight loss according to its two chief goals; losing weight and toning and shaping the body - you'll see that aerobics can't give you everything you need.

Home Fitness Equipment

Home fitness equipment sales have boomed in recent years. TV infomercials continue to successfully hawk a variety of stationary bicycles, rowing machines, universal machines, home gyms, treadmills, mini-trampolines and a variety of "miracle" abdominal contraptions nightly. Turn on your TV any weeknight after 2 A.M. and it looks like the exercise gurus have taken over. Is all this equipment good for losing weight?

In most cases, no! Most people are far better off joining a gym or health club. The fact is that most people don't have the expertise, stamina and self-discipline to make a go of it at home. Most of the home fitness equipment that gets sold ends up collecting dust in the corner of the garage after the two or three weeks of initial enthusiasm passed.

You are much more likely to stick with an exercise program if you're in the right surroundings and exercising with other people who are enthusiastic about working out and having someone to guide you. Home gym equipment can be useful when you just can't make it to the gym and want to get in some kind of workout. Generally, however, it's only good as a stopgap measure.

Another way to make your fitness program more productive is to have someone to train with. They can be a friend or someone you meet at the gym or your spouse. There will be many times when you'll not feel like working out.

Chapter 8: In The Beginning

No matter what program you're on or how good it is, you will go through periods where inspiration will be lacking. If you've made a commitment to meet someone at the gym, you'll be much more likely to show up. Invariably, once you arrive and begin working out, you'll be glad you made the effort.

Sports

Any sport can be effective for increasing fitness and helping you lose weight. Squash, handball, soccer and cross-country skiing can be quite vigorous and demanding and can aid greatly in taking the pounds off. Tennis, basketball, baseball, downhill skiing and water skiing are generally less taxing and effective, but they can also play a role in weight loss under the proper circumstances.

Injuries, however, can be a problem. Pacing yourself when under the stress of competition can be difficult. Still, sports can provide pleasant, productive and supplementary activity to your regular exercise program. If you enjoyed a particular sport earlier in your life and lost contact with it, you may want to rediscover it at this time.

In The Beginning

It is very important not to overdo it when you begin any form of exercise. This is especially important if you have not been active for a while. Go slow at first. Remember that getting in shape takes time and patience. It's easy to be tempted into doing too much and end up getting discouraged or hurt. Start small and slowly work your way up.

Above all, don't make exercise a chore. Choose doing things you enjoy rather than those you feel you need to. And don't feel you need to rely on one activity for all your exercise. I'll be suggesting that you go on a weightlifting program later in this chapter but, other than that, you should vary your activity. Change with the seasons. Play golf, tennis or swim in the summer. Attend aerobic classes, ski and play racquetball in the winter.

Making Excuses

Many people say they can't find the time to exercise. I think they're only fooling themselves. For most people the only thing that stands between them and exercise is the time they squander on less important activities like TV. If you make exercise a priority in your life, and you should, most people will have no problem finding the time in which to do it.

There are as many reasons for not exercising as for not sticking to your diet. Next to lack of time, not knowing what to do is the most prevalent. Many people have little knowledge of exercise beyond the calisthenics they may have done in high school. They see exercise as a rigid, unenjoyable activity.

This is incorrect. There is a form of exercise for everybody. In fact, at its broadest definition, exercise can be seen as doing any physical activity beyond what you're doing now. Be it walking, aerobics, tennis, swimming or any one of the hundreds of other sports or forms of exercise in existence I guarantee there are at least one and probably several activities you will enjoy.

And don't make that excuse about being too old to exercise. No one is too old. Anyone can and should become fit. Day to day life becomes much easier and you'll look and feel younger when you exercise.

The Weekend Warrior Syndrome

We doctors see the "weekend warrior" syndrome in play far too often. You'll usually find it among people who restrict their activities to the weekend and do too much too fast. Injuries and soreness result and you end up being laid up for long periods and lose all the momentum you might gain from that new exercise program.

It's important to realize that exercise should not just be a Saturday and Sunday activity. You should be exercising regularly during the week as well. You also need to learn to pace yourself and only do what your body is capable of doing.

As well, it's important to listen to your body. If it aches too much the next day, you're doing something wrong. The body doesn't lie. If you can't catch your breath, you're overdoing it. If you're in pain and your body is cracking like a bowl of just milked Rice Krispies, you ought to back off.

Similarly, if you feel too ill to exercise you shouldn't. By exercising when you feel ill, you're doing yourself more harm than good. Illness is a time to recuperate and relieve yourself of stress so you can get well.

On the other hand, if it all seems too easy and you're not experiencing any challenge or minimal discomfort, step up the pace. Exercise programs should be progressive to provide continuing variety and challenge. If you're unsure of where to go and how far, talk to a trainer.

Chapter 8: Beginning An Exercise Program

Beginning An Exercise Program

Any exercise that burns off more calories per minute than you normally would is a step in the right direction. Many have found it helpful to start by going for a brisk walk every day and gradually making the walk more demanding by increasing pace and distance. If this is not enough for you other activities like swimming, bicycling, skating, jogging, and aerobic dancing can be helpful. More demanding sports like racquetball or wrestling can fill the bill for those with advanced needs.

But, by far, the best shaping and fitness activity is aerobic weightlifting. It combines a sound approach to cardiovascular fitness through aerobic exercise with the toning and shaping properties of weight lifting.

How To Stay Motivated

Whatever kind of exercise you choose, the key to success is feeling good about the activity and enjoying it. If the activity is not enjoyable and the whole experience doesn't give you a lift, then you won't last. You'll find some excuse for beginning to miss exercise sessions early on and will eventually drop the program altogether.

Along with enjoying the exercise for itself, it's also important to enjoy and appreciate it for the part it plays in your weight loss program. You'll enjoy exercising more if you take note of the results you're getting. Always take the time to make the connection between exercise and increasing fitness and body tone and give yourself a pat on the back for it.

Exercising with a group that shares your enthusiasm will also help keep you motivated. That's why I prescribe joining a gym or health club and exercising with partners. Having one or more good partners to work out with will ensure that you exercise regularly.

Keeping a record of your exercise sessions and weight may also be helpful. Earlier in this book, I told you that body weight can be deceiving and that following it too closely could be misleading and frustrating and I hold to that belief. Still, keeping a log of your exercise program and comparing it to weekly weights may add motivation where needed. This allows you to chart your progress and give you added evidence of the effect exercise is having on your body. If you're measuring body fat or body parts like the waistline or hips, tracking these alongside your exercise program can also be helpful.

Beware Of Exercise Gimmicks

Losing weight is never easy. Let's face it, there is no such thing as an effortless way to lose weight and shape your body. You've got to show some dedication and effort to succeed. Dieting is difficult, especially for overweight people.

That's why they're ever hopeful for a quick cure, even though there isn't one. It is on these false hopes that the con artists prey. Those TV and magazine ads all claim to make you thin and fit the "easy way" - and all "in the comfort of your own home". They don't.

Stay away from anything that promises you effortless weight loss. Such a thing doesn't exist. Anybody that says it does is pulling your leg. The only thing that will lose weight is your wallet.

Many people seem to think that any gimmick that makes you sweat is a weight reducer. Unfortunately, sweating is not synonymous with losing solid weight, only water weight. This water weight readily goes back on once you drink some fluids and rehydrate yourself. In fact, exercising in one of those crazy rubber or plastic suits can be dangerous because of heat buildup. In the end, you could suffer heat stroke.

Bust Developers

When losing weight some women will lose size off their breasts, a place where many would rather put weight on. As a result, many women look for ways to increase or maintain bust size while losing that unwanted fat from the waist, buttocks and legs. All this is understandable. We live in a somewhat breast-conscious society where beauty is often equated with breast size. Many of the models you'll see today have that combination of rail thinness and bountiful bosom (in many cases breast implants impart some or all of that look).

Unfortunately, there are no exercises, devices or creams that will increase bust size, regardless of what the ads say. Those "bust development" courses include exercises that have absolutely no effect on breast tissue. They only work on the ribcage and chest muscles. While chest size may increase (due to development of the ribcage and pectoralis muscles under the breast) the actual size of the breasts doesn't change. For example, you'll go from a 36B to 38B after the exercises.

Those devices and creams sold to increase breast size are also useless. Hormone creams may temporarily increase the glandular tissue in the breast (similar to the effects of pregnancy), but this increase is only temporary and can result in serious health consequences.

Spot Reduction Gadgets

Spot reduction exercises and gadgets, most notably those for the abdominal region, don't work. You can tone and strengthen the muscle under the fat so that the area looks better, but you won't reduce the amount of fat under the skin unless you're in the process of losing weight and fat throughout the body. It's impossible to selectively burn off fat from a certain part of the body by exercising, massaging or vibrating that area.

Chapter 8: How To Pick A Training Partner

The Metabolic Diet is the best spot reducer you'll find. Unlike other diets where problem areas remain as you lose weight, the Metabolic Diet burns fat equally throughout the body including those difficult areas like the waistline, hips and buttocks. You won't need to worry about spot reduction because the diet will impact all areas on the body where fat has become a problem.

Aerobic Weightlifting

A sound program of aerobic weightlifting is one of the best ways to aid overall weight loss and shape and tone your body. It will greatly enhance the effects of the Metabolic Diet and can be an integral part to creating the kind of body you seek.

Though you can buy weights and machines to use at home, I would again strongly urge you to join a gym where qualified instruction is available. The cost of membership is generally not too high. You may pay up to $50 a month for privileges, but you can also find places that are below $25 if you look.

Exercising in your garage or living room can get pretty cold and lonely. And the best way to learn the basics is to be shown the correct way to do the exercises. Your personal trainer at the gym will do this. Meanwhile, watching and learning from more experienced members at the gym will also help you in learning the exercises and determining which work best for you.

How To Pick A Training Partner

You're also less likely to miss a workout if you're committed to going to the gym. This is especially true if you're training with someone else and they're waiting for you. A partner can also help to motivate you while you're in the gym to get the best workout possible. His or her attitude and your relationship can make your time at the gym more fun than it might normally be. He or she can help pick you up on a bad day.

What you want in a training partner is someone you can have a mutually supportive relationship with. They should be able to come to the gym during the same hours. If you have to wait around 15-20 minutes for them to arrive or you're uncertain whether they'll get there at all, you can start losing motivation for working out that day. You can end up walking away or offering a half-hearted effort.

Your partner should also have the same basic training program as you. Otherwise, he may want to do different exercises and this may influence you to depart from your regular program. Losing the focus of your training can seriously affect your progress.

Both partners should be motivated. If you've got a partner who's not as motivated as you and you're trying to pull them along all the time, you may find yourself losing your own motivation in the struggle to keep them involved.

When To Work Out

Many people find mornings the best time to work out. There are fewer distractions in your life at that time. You don't have to worry about something happening during the day to change your schedule or getting home and feeling too tired to work out.

Most people who try to set up training at 9 or 10 PM at night don't make it because of this. The idea of lifting weights after a long day is not appealing. Exercise can also leave you excited and unable to sleep for a while. On the other hand, morning workouts can get you a nice mental high to start the day with.

But no matter what time you work out, the biggest factor is picking days of the week and times for your workout and sticking with them. Find a time that's good for you, when you can relax and put everything down. This may mean picking a gym that's five minutes away from home. If you've got to drive 40 minutes through traffic to get to that "perfect" gym you could be very stressed out by the time you arrive and this can hurt your workout and make you less likely to get there for your next one.

You may have to take into account the schedule of your training partner and preferences for gym. However, if you're on a tight schedule, being able to easily get to the gym for every workout is a key factor. Even if the facilities aren't as good, picking that gym close to home can be the difference between a good exercise program and one you'll give up on.

Exercise Machines Vs. Free Weights

Comparing the benefits of exercise machines (such as Nautilus or the universal gyms) with free weights (dumbbells and barbells) is a favorite pastime of many weightlifting enthusiasts. In most any gym, you'll find spirited debate between the proponents of each.

The bottom line is that for most people it doesn't matter. Both have their advantages and disadvantages. Free weights provide more flexibility in the way different muscle groups can be worked. If you're targeting specific muscles for stimulation, free weights are by far your best choice. That's why professional bodybuilders and other athletes prefer free weights.

Machines have advantages of their own. They're generally easier to learn how to use. You also don't need a training partner. With free weight exercises, especially as you advance, you'll find it necessary to have someone nearby in case you need some help or get stuck with a weight at an awkward time. This isn't necessary when using machines.

Chapter 8: When To Work Out

Equipment is not nearly as important as how you use it. The most important thing is to get your workout in on a regular basis. Commitment is as important to your exercise program as it is with your diet. Making sure you're in the gym when you're supposed to be and working out provides the foundation for future success.

As you continue with your exercise program you'll find your motivation for getting to the gym increasing. You'll begin to enjoy your sessions. You'll look forward to that high you get from working out and rely on it to get you through the day.

You will, no doubt, experience times where motivation lags. During these times it is especially important that you keep your date with the gym. The physical and emotional sense of well-being you get from your workout will quickly give you a lift and put an end to any doubts or reluctance you may have toward exercising.

Starting A Weight Training Program

If you prefer or have to work out at home, all you'll really need to start is a set of barbells and dumbbells (dumbbells are held in each hand while the barbell is a long bar of steel held with both hands), a bench and a set of squat racks. Again, however, I must urge you to join a gym if at all possible to learn proper technique. There you'll have the proper motivation and expertise available to get your exercise program off to a good start.

Training frequency, or how regularly you train, will be an important factor in your success. I think that three exercise sessions a week is enough at the start. Though you may feel like jumping headlong into a program and exercising every day, you'll regret it later on. Your body and mind need a chance to adapt to the program.

Recovery is also important. You need to be able to recover from your individual sessions to sculpt the kind of body you want. You also don't want to overtrain. Overtraining can lead to injury and lessened efficiency in the exercises you do. You may even find yourself losing muscle tone instead of gaining it.

You may experience some muscle soreness at the beginning of any program. Sometime during the first three weeks you may also experience a loss of strength. Do not be alarmed by either condition. Some soreness is natural as your body adapts to your new exercise program.

The "loss of strength" some people experience after a couple weeks of exercise is also very natural and it will disappear in a week or so. In fact, you'll experience a kind of "rebounding" effect after this period where strength and endurance will seem to skyrocket. If soreness is severe or strength doesn't return you'll want to consult your trainer and doctor, of course. But, generally, these conditions are minor and temporary in nature.

You'll also find your ability to recover improving as you continue your exercise program. This will allow you to increase the frequency of your workouts if you desire. At the beginning, though, three workouts a week are enough. You should also make sure that those first workouts are relatively easy ones. Don't push. Get to know the gym, machines and techniques. There's no hurry.

Your program will consist of several exercises done with either free weights or progressive resistance machines (like the Nautilus or pulley-like machines). Your workout will consist of "repetitions", or "reps", and "sets". A "repetition" simply involves performing an exercise all the way through a single time. Doing two complete sit-ups, for instance, would constitute two "reps" of the exercise. A "set" is defined as how many "reps" of the exercise you do before stopping to rest. Doing 10 complete sit-ups and then resting would constitute a "set" of 10 "reps".

In most programs, for the first few weeks, you'll be doing only one set of each exercise for 12 repetitions. This means you will perform the exercise 12 times without any rest in between the reps and then move on to your next machine or exercise after a brief rest period.

In the third week, weight lifters will begin to do two sets of 12 repetitions for each exercise. In the fourth, they may begin to do three sets of 12 reps for each exercise. After this, instead of increasing sets or reps, they'll increase the weight used. When working areas of the body that really need trimming and toning, however, the amount of reps performed can be increased.

The amount of weight you choose to lift is always a concern in the early part of a weight-training program. The fact is that there are no adequate guidelines here. Individual differences are so wide that there's no one formula that works for everybody.

Bottom line, the weight you pick to lift on each exercise should be determined by the reps you're scheduled to perform for that exercise. You should pick a weight that is challenging and that will allow you to do the reps required. If you are supposed to do 12 reps and find you're able to do more, you should add some weight to the bar or machine. If you can't make the 12 reps, then you should subtract weight.

Knowing how much weight to lift is something you'll learn from experience. The first few workouts you may find yourself alternating between weights that are too heavy and too light and doing a lot of experimentation. It may be frustrating but you'll develop a feel for this soon. As a rule, though, it's better to first choose a light weight. If the repetitions come too easily, you'll know to increase the weight during the next set or exercise session.

Again, having a trainer can be a great help in this area. If you have one available they'll be able to give you a good idea of how much weight to lift and how much and when to add weight as you move along in your program. You'll also find yourself beginning to vary the number of reps and sets according to the exercise and parts of the body you want to concentrate on as you continue. Weight training should be a constantly evolving activity. Reps, sets, weight and exercise type will be changing as needed to continue progress and keep from going stale.

How Hard Should You Work Out

Once you're ready for harder workouts, it's important to keep up a good pace. A minimum of time should be spent between sets and exercises so you keep your heart rate elevated and don't cool down too much.

As you become more experienced, you may want to try what is known as "aerobic bodybuilding", where the cardiorespiratory system is further challenged and trained. In "aerobic bodybuilding" exercises are done as quickly as possible with the goal of raising the heart rate 40-60 percent above its resting rate (ideally somewhere between 100-130 beats a minute depending on your resting rate). Time between sets should be no more than one minute so the heart rate doesn't have a chance to get back down near the resting rate.

One way to do this is to alternate two exercises that work different body parts and only take a few seconds rest between sets. This way, muscles are rested so they don't fatigue while the cardiovascular system keeps working. A few minutes rest can be taken before the next two exercises are alternated. If you wish, more extensive aerobic dancing, running, swimming, bicycling or other aerobic exercise can be done once or twice a week to add to the aerobic portion of the exercise program.

A note about breathing: while performing exercises, keep your breathing as natural as possible. Don't hold your breath while exerting yourself. You may inhale and exhale as you perform an exercise; whatever feels comfortable.

Overtraining

Exercise is the most powerful and potent body shaper available. But, as in most things in life, you can get too much of a good thing. While hormones critical to body shaping increase as the intensity and duration of exercise continues, they will become severely depressed if you overtrain.[183] At the same time, as the duration of exercise increases so do cortisol and the cellular breakdown of protein and, ultimately, muscle. Because of this, it's important to train at the right intensity and pace to maximize hormonal response while ensuring that you don't overdo it.

A short, intense approach to workouts is probably the best for most people, whether on the Metabolic Diet or not. A rigorous workout limited to no more than 45 minutes to an hour seems wisest, although some allowances for personal preference or training strategy can be made.

All resistance training programs, as long as overtraining is avoided, will result in some increase in GH or testosterone. However, I've found that keeping the exercise sessions to an hour or less and using moderately heavy weights for 6-20 reps maximum with only limited rest between sets, optimally increases both GH and testosterone. After about an hour of intense training, the ability of the body to benefit from the workout rapidly decreases. If you're a go-getter and tempted to perform those 2-hour marathon sessions at the gym, wake up. You may well be sacrificing some of your progress.

If you're dedicated to taking your exercise program to the maximum, more power to you, but keep a careful eye out for the classic warning signs of overtraining. Irritability, depression, loss of motivation, increasing soreness, swelling of lymph nodes, loss of appetite, and bowel problems can all be part of the overtraining syndrome. If you're overtraining, back off. Look for that level of work where you're right at the edge between maximum body shaping or building and doing too much.

As we've pointed out, it's necessary to combine all aspects of a person's life, including diet, training and lifestyle to create a synergistic effect on muscle growth. Along this line, exercise complements the higher-fat/low-carb diet very well. Exercise increases the use of free fatty acids in muscle and decreases fat buildup, thus adding to the lipolytic effects of the higher-fat/low-carb diet.[184] The reduced carbohydrates available on the diet have also been shown to play a role in increasing the mobilization of triglycerides during exercise, thus enhancing the fat-burning process.[185] With the Metabolic Diet, you're a winner in more ways than one.

Chapter 8: The Metabolic Diet Exercise Programs

The Metabolic Diet Exercise Programs

I've outlined below a series of three programs tailored to the different goals a person may have while on the Metabolic Diet. I believe it's best to do 6-10 different exercises - one or more for each major body part (back, legs, chest, etc.) - during each workout. You can add exercises for those areas you want to concentrate on as needed.

For those with limited time or commitment, a simple program using just two exercises - the parallel squat and bench press - can be done. These two exercises will give you a workout that will tone and firm most parts of the body. Although I think it's better to engage in a more extensive exercise program, multiple sets of these two exercises may suffice when time is limited and a full workout is inconvenient.

The first program is for people who primarily want to lose weight and are only minimally interested in toning and body shaping. The second is for people who want to lose fat and tone up. The third is for the most serious dieter who not only wants to lose fat and tone up but to also gain muscle and strength.

Keep in mind that there are a variety of machines and variations available for working each part of your body. These are only suggestions. Your trainer may have other good ideas. We suggest you work closely with a trainer in devising an exercise program and putting it into practice.

Of the exercises listed for each program, you should pick 6-10 to do, at least at first, making sure that all areas of the body are worked during your regular session. If you want to concentrate on some part of the body, you might want to choose more exercises for that part. That's okay as long as you work the rest of your body as well so that you don't lose overall body symmetry. You may, of course, substitute and change exercises as needed.

The number of sets to be done with each exercise is listed, but they can be changed as your program continues. For instance, at the beginning you may only want to do one set each as you get used to the program. Three sets should generally be your maximum on an exercise. After that, you should increase the weight you're using. As mentioned above, don't be in a rush for progress. Later, depending on your goals, you can increase your workout to the level you desire.

The Slim Down Program (Three Days Per Week)

Warm-Up: Start with 5-10 minutes of stationary bike, treadmill or stepper work.

The Workout: Choose 1-2 exercises for each body part.

Exercise	Reps	Sets
Leg Press	15 - 20	2
Leg Extensions	15 - 20	2
Leg Curl	15 - 20	2
Inner Thigh	15 - 20	2
Outer Thigh	15 - 20	2
Calf Raise	15 - 20	2
Shoulder Press	15 - 20	2
Bench Press	15 - 20	2
Seated Chest Press	15 - 20	2
Biceps Curl	15 - 20	2
Lower Back	15 - 20	2
Seated Row	15 - 20	2
Triceps Push Down	15 - 20	2
Abdominals	15 - 20	2

Cool Down: End the program with 10 minutes of bike, treadmill or stepper work.

A Sample Routine Might Be:

· Leg Press
· Calf Raises
· Bench Press
· Seated Chest Press
· Seated Row
· Triceps Push Down
· Biceps Curl
· Abdominals

All done for 15 to 20 reps. When you reach the 20 reps you add some weight and do as many as you can. When you reach 20 reps add even more weight, and so on.

Chapter 8: The Slim Down And Body Toning Programs

The Body Toning Program

Though you will firm and tone the body in the above program, you will get the edge on advanced toning and body shaping by performing exercises using more weight and less reps. That's the focus of the program below. You'll still be losing weight and increasing cardiovascular health but you will find an increased effect on overall musculature.

Warm-Up: Start with 5-10 minutes of stationary bike, treadmill or stepper.

The Workout: Choose 1-2 exercises for each body part.

Exercise	Reps	Sets
Leg Press	10 - 12	2
Leg Extensions	10 - 12	2
Leg Curl	10 - 12	2
Inner Thigh	10 - 12	2
Outer Thigh	10 - 12	2
Calf Raise	10 - 12	2
Shoulder Press	10 - 12	2
Bench Press	10 - 12	2
Seated Chest Press	10 - 12	2
Biceps Curl	10 - 12	2
Lower Back	10 - 12	2
Seated Row	10 - 12	2
Triceps Push Down	10 - 12	2
Abdominals	10 - 12	2

Cool Down: End the program with 10 minutes of bike, treadmill or stepper work.

A Sample Routine Might Be:

· Leg Press
· Calf Raises
· Bench Press
· Seated Row
· Shoulder Press
· Triceps Push Down
· Biceps Curl
· Abdominals

The Muscle and Strength Program

This program is for the dieter who is in relatively good shape and wants to build muscle and strength. It may also be a program you evolve into after staying with the previous programs for a while. Consult with your trainer or another knowledgeable source for proper technique on these advanced exercises.

You might choose to do a split-routine, such as legs one day and upper body next workout. Or even a three-day split, such as: Day 1, legs; Day 2, chest and triceps, shoulders; Day 3, back, biceps and abs. Schedule your workouts on non-consecutive days.

Warm-Up: Start out each exercise by doing a set of 6-8 reps with lighter weight.

The Workout: Choose two exercises for larger muscle groups, one for smaller muscle groups.

Exercise	Reps	Sets
Lower Body		
Leg Press or Squat	6 - 8	3
Hack Squats	6 - 8	3
Leg Extensions	6 - 8	3
Leg Curl	6 - 8	2 - 3
Calf Raises	10 -12	3
Chest and Shoulders		
Bench Press	6 - 8	3
Incline Dumbbell Press	6 - 8	3
Shoulder Press	6 - 8	2 - 3
Deltoid Work	6 - 8	2 - 3
Back and Arms		
Deadlift	6 - 8	3
Seated or T-bar Row	6 - 8	3
Lat Pull-Downs	6 - 8	3
Back Extensions	8 -10	2
Triceps Push Down	6 - 8	2 - 3
Biceps Curl	6 - 8	2 - 3
Abdominals		
Crunches	10-12	2 - 3
Leg lifts	10-12	2 - 3

Chapter 8: The Muscle and Strength Program

Splitting Up Your Workouts

All of the above workouts could be done in one day, 2-3 times a week or split up in various ways. For example a two-day split could look like this:

Monday and Thursday

- **Squats**
- **Leg Press**
- **Calf Raise**
- **Lower Back Raise**
- **Crunches**

Tuesday and Friday

- **Bench Press**
- **Seated Row**
- **Delt Work**
- **Triceps Push Down**
- **Biceps Curl**

In this case, each body part is worked twice a week. Splitting up the workouts allows you to concentrate more on specific body parts.

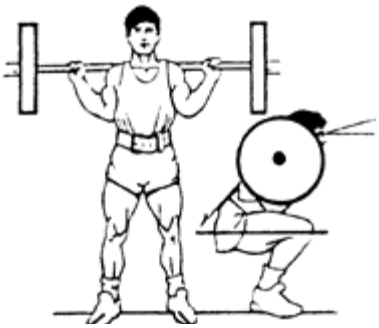
The Exercises

A Word about Technique

You'll note that I stress the importance of a trainer or other qualified person in your exercise program. To do the exercises properly, learning proper technique is essential. If you go into the gym saying "Oh, it's just lifting weights" or "I don't care how I do it, I just want to get the weight up" you'll pay a price. You won't get the kind of shaping you're looking for and you may even risk injury. We'll give you guides to several exercises below, but you should still attempt to talk to the experts to answer any questions about technique or the proper way to perform these exercises.

As always, check with an expert source for the fine points of technique and proper operation of machines. Remember, without proper technique you'll be robbing yourself of much of the progress these exercises can give you. By perfecting technique you'll be making these exercises as efficient and productive as possible and getting the very best out of your exercise program.

Squat



The parallel squat is the king of exercises for the lower body. It works the musculature of the hips and legs as well as working the back, abdomen and ribcage area. If done with many repetitions it will provide both cardiovascular fitness and shaping for the lower body. There is no better exercise for achieving overall fitness.

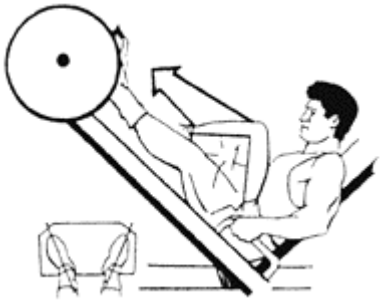
The best way to do the squat is to hold the barbell behind the neck resting on your traps. The bar should not rest on your neck or near your shoulder blades. This will make you lean forward and stress the lower back instead of the legs, leading to injury.

Feet should be positioned at hip width or wider. You can move them in or out as you become more experienced with the exercise until you find the best spacing for you. Take a wide grip on the bar and point your feet slightly outward.

Looking straight ahead, do a deep knee bend until the tops of your thighs are parallel to the floor, with the center of your weight balanced over your heels. Keep your lower back arched and abs tight. Don't let your knees travel further out than your toes.

At the beginning you may not be able to get down this far. Try lighter weights and see if this helps. You might even practice the form with a broomstick until you master it. It's important that you don't go right down in the squat so that your buttocks almost touch the backs of your feet. This can cause a knee injury if you're not used to doing full squats with weights. Consult with your trainer or other qualified person to get insight on the fine points of the squat. When done properly, it is a safe and extremely effective way to work, tone and shape the lower body.

Leg Press



The leg press primarily works the quadriceps, but it also works and firms your hamstrings, inner and outer thighs and buttocks. Your feet should be at hip width, as high as possible on the platform. Point your toes slightly out.

As you lower the weight, knees should move straight back over the toes until there's at least a 90-degree angle at the knee joint. Keep your hips pressed fully back against the pad. If you feel your pelvis moving forward, push the weight back up. It may take awhile to get the hip flexibility necessary to get the knees to a 90-degree angle, especially if you are just starting an exercise program. Keep with it; it will come.

Heels should stay flat against the platform, pushing throughout the entire bottom of the foot at all times. Be sure to push evenly with both legs. All movement, both up and down, should be slow and purposeful. Don't lock your knees out completely at the top of the movement.

Leg Extensions

Leg extensions are excellent for toning and developing the lower quadriceps muscles (located at the front of the leg) that are used to extend the leg. You can exercise both legs at once or one at a time. While an extremely useful exercise, leg extensions may be counter productive in some people who have pre-existing knee problems.

To begin, adjust the seat so the back of the knee is resting firmly against the front of the seat. The pad at your feet should make contact just above the foot. As you begin the movement, the knee joint should be at 90 degrees or a little less. You definitely don't want your knee bent backwards.

Fully extend your knee to a parallel position so it "locks out". Keep your hips pressed against the back of the pad. The knee should hang just over the edge of the bench pad. The knee should also be in alignment with the pivot point of the machine throughout the exercise. Return the weight to the start position while offering resistance. Don't allow the weight to snap back or use the machine to create momentum.

Leg Curls

The leg curl is a good exercise for toning and strengthening the hamstring area in the back of the leg. Lay on your stomach with your knee joint hanging just over the edge of the bench. Position the resistance pad just above the ankle on the back of the legs.

The bench should naturally elevate the hips. If it doesn't, place a rolled-up towel under the hips. Hold the handles of the machine to keep your body stabilized.

Curl the weight until it reaches a 90-degree angle in the knee joint. Don't hit your backside with the weight and don't let your hips ride up. Keep your feet flexed up and pointed straight ahead. As above, offer resistance as you bring the weight back down.

Inner/Outer Thigh

The inside and outside thigh areas can be particularly difficult to tone, especially for women.

While the squat or leg press can be excellent exercises for toning the legs, they can also hurt the back or knee if done improperly. These two exercises may offer a way to work the inner and outer thigh. However, women especially should realize that doing these exercises will not magically cause body fat on those areas to disappear. That is a function of one's overall exercise and nutrition program.

Outer Thigh

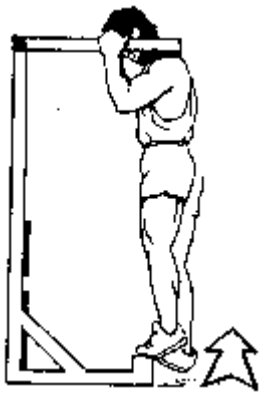
Inner Thigh

The abductor-type machines provide a scissors-like movement with the legs. They have become very popular and can be found in most gyms. The outside abductor primarily works the outside thighs but also provides benefits for the buttocks area.

It begins with the legs in closed position with the outside thigh resting firmly against the pads. Grasp the handles at the side of the machine and push both legs outward to the fullest extension allowed by your available range of motion. When returning to the start position to complete the rep, go slowly. Don't allow the weight to go all the way down before beginning the next movement. Many machines will allow you to work a single leg at a time by making the proper adjustment with the handle.

With the inside abductor you place the inside of the legs against the upright pads and position the pads to the extension desired. Your goal is to fully work the inside of the thighs, but you don't want to create a muscle strain or tear so the start position should be determined by your available range of motion for the movement. Simply grabbing the handles at the side of the machine and bringing the leg pads together performs the exercise. Legs are then returned to the fully extended position.

Calf Raise



Also known as the "standing heel raise," this exercise is excellent for toning and shaping the calves. Place feet at hip width, pointing straight ahead. The balls of the feet should be at the edge of the platform. Keep shoulders, hips and ankles all in alignment. Legs should remain straight.

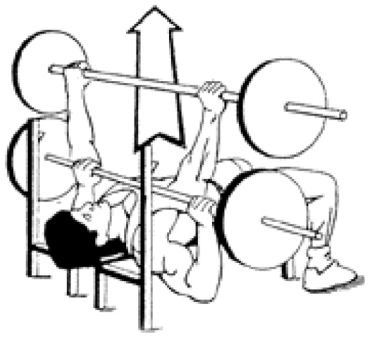
Begin the rep by lowering heels as far as possible to get maximum extension of calf muscle and resisting the weight. Then lift weight on shoulders by raising heels as high as possible. Make sure not to bend the knees. Keep abdominal muscles tightened to stabilize the upper torso and lower back.

Bench Press

The bench press does for the upper body what the squat does for the lower. Firming the pectoral muscles of the chest is generally a must for men and women when toning and reshaping their bodies. The bench press is a very popular exercise that works this area extremely well.

As the name suggests, this exercise is done while lying on a weight bench. Grip the bar a little outside shoulder width so that when the elbows are in line with the shoulders there's a 90-degree angle at the elbow. Feet should similarly be at a 90-degree angle to the knees.

Press the barbell straight overhead. Don't raise your buttocks off the bench as you lift. Take the bar to fullest extension without locking out the elbows and lower it back down making sure your elbows don't ride in toward the body. Wrists should remain straight as you bring the bar back down toward your middle or upper chest area. Don't bounce the bar off the chest. Just before it reaches the chest, begin to push back upward again to start your next rep.



Unless done on a machine, this exercise should never be done alone. You can tire out and may need some help getting the weight off your chest. Again, training from an experienced and knowledgeable person will greatly aid in perfecting your technique.

Seated Chest Press

This is an excellent and popular exercise for stretching and stressing the pectoral muscles and upper chest that you may find a little easier to use than the bench press. Grip the handles of the machine with your palms facing down.

Press the handles forward in a controlled motion keeping the shoulder blades against the back pad. Be sure not to protract the shoulders forward so that the shoulder blades leave the back pad as this places undue stress upon the deltoids and shoulder girdle.

Return the weights to the side offering resistance. Check with your trainer or an experienced weight lifter for tips here.

Seated Row

The seated row is a simple, effective and relatively safe way to work the back. As its name suggests, the motion made by the machine is similar to that performed when rowing a boat.

Grab the cable handles firmly, straighten and arch your back. Your upper body should be perpendicular to the floor at all times during this exercise. The knees should be slightly bent. Once you have them in position, don't let them bend further to help with the movement. The back is being targeted here, not the knee.

Pull the cable toward the navel, keeping it low. Don't use the wrists. The arms should be supplying the movement with your back muscles absorbing the stress.

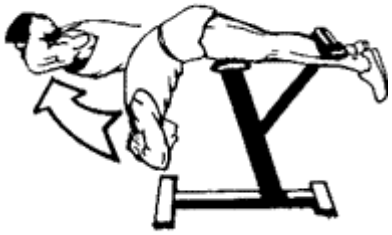
As you bring the bar toward your abdomen, squeeze your shoulder blades together and raise your chest forward. Always keep in mind that you're working the back muscles here. If you're feeling a lot of stress in another area, you're doing the exercise incorrectly. Be sure to keep your abs tight to stabilize the lower back.

Don't rock. As you get tired, you might find yourself using your hips to help move the weight. Keep the hips stabilized, and work the back muscles. Elbows should stay close in to the body and be pulled as far back as possible as you bring the weight toward you.

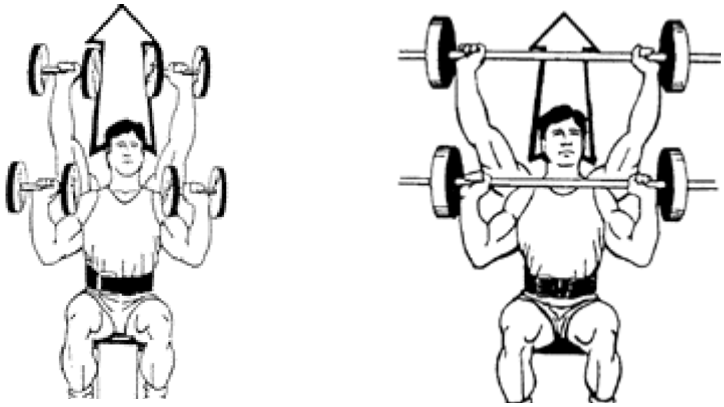
Back Extension

There are several good exercises available for toning and strengthening the low back area. Your trainer will probably have an exercise he prefers. One simple way to work the back area is with the back extension. Unlike some other exercises, chances of back strain are minimal with it if performed properly.

On a glute-ham developer or similar bench, position yourself so the edge of the pad on the bench is right under your pelvic area. Keeping your legs straight, raise your body to just above horizontal position. Lower your body down slowly to the start position for a stretch and to complete the rep. This exercise should be performed with control and with tight abs.



Shoulder Press



Also known as the "overhead" or "military" press, this is the most popular exercise for working the shoulders in the gym. We'll show you the exercise using dumbbells here, but it can also be performed with a barbell or on a machine.

You can sit or stand while performing the movement. If standing, spread your feet apart in a natural stance and tighten your abdominal muscles to stabilize your low back. If sitting, make sure you use a backrest. You don't want to arch your back in this exercise.

Palms should be facing forward at shoulder level. Elbows should be directly below the hands and in front of the shoulders, not widened out. Press the weight above the head being careful not to change hand position, and return the weight to about ear level, keeping tight at the bottom position.

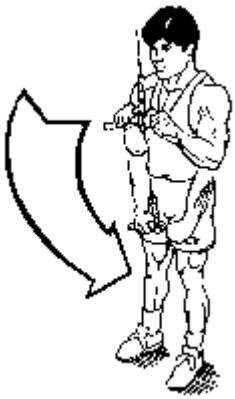
Biceps Curls

The biceps and upper arms are often a showcase and indicator of fitness. The standard barbell or dumbbell curl is one of the most efficient, simplest ways to work this important body part.

Biceps curls may be performed sitting or standing. If standing, feet should be at shoulder width, palms facing upward in a position just outside the hips. Keep elbows close to the body, arms fully extended. Curl the weight until your forearms meet your biceps. The bar or dumbbell should go no further. You can use your knees to help with balance.

Hips and shoulders should stay still during the exercise. Keep those elbows close to the body. Don't flex or use your wrists to move the bar. Your biceps should absorb most of the stress.

Triceps Pushdown



There are many ways to work the triceps. The triceps pushdown is one of the most simple and productive. Grip the bar with palms facing down. Place the feet in a comfortable position, as they'd be in walking. Bend the upper body forward at a 20-degree angle. Elbows should be locked directly under shoulders and keep the upper arms stabilized against the side of your upper body.

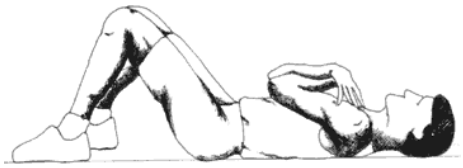
Pull the cable straight down with your forearms until in line with the elbows and shoulder. Only the elbow joint moves. The shoulder joints remain stationary throughout the exercise and elbows remain close in to the body.

Return bar to the starting position while applying resistance. Hands may ride above the elbows to the point where the forearms touch the biceps. Just make sure your shoulders don't rotate forward and your elbows leave the side of your body.

Chapter 8: Going Beyond The Basics

Abdominals

There are a variety of abdominal exercises to choose from. Your trainer may have you working on an abdominal machine in the gym or a particular sit-up variation. Below is a simple form of sit-up you can use when working the abdominal area.



Lay on your back with feet flat against the floor and knees bent at about a 45-degree angle from the waist. Fold your arms across your chest. Then slowly curl up, making sure to use the abdominal muscles and not the shoulders. Go up to a 45-degree angle in relation to the floor, if possible , but do not push off the floor with your legs. Don't lift your hips to gain momentum.

Bring your head and shoulders back to the floor in a controlled movement. Don't just release your body and allow it to flop back to the floor.

Going Beyond the Basics

The programs and exercises we've outlined above, while adequate for the beginner to intermediate body builder and weight trainer, are not by any means exhaustive. For a more detailed and tailored exercise program, or simply for more variety, have a look at www.CoachSOS.com . On this site you will find personalized training programs for general fitness, bodybuilding and a variety of sports, videos of the exercises, and training information and tips. The experts on CoachSOS.com can become your personal trainer and, along with The Metabolic Diet, help maximize the muscle building, toning and fat burning effects of exercise

Chapter 9

Diet Pills

Chapter 9: Are They Really Needed?

Are They Really Needed?

The Metabolic Diet and a sound approach to exercise will be all most people will need to lose weight and keep it off. In most cases the side effects and dependency problems of drugs are entirely unnecessary and can even be counterproductive.

However, there may be a place for drugs in a select number of people. If you're "morbidly obese," defined as weighing twice your ideal bodyweight or more, drugs may be an answer to getting your weight under control and even saving your life.

Likewise, there are some people who can't seem to lose weight no matter what they try. They're seriously overweight. They're dedicated to losing the weight, they make the effort, but, in the end, they just can't seem to sustain a weight loss program. For these people, the appetite suppression and stimulation of the central nervous system's calorie burning mechanism provided by diet medications may be essential to weight loss.

I also think that diet medications may be helpful in getting a patient past those "plateaus" where weight refuses to come off. In this situation, drugs may be prescribed for a short period of time until the "crisis" has ended and weight loss has continued.

But, even then, there are only a select number of cases where medication should be used. It must also be clearly understood that drugs won't provide for proper weight loss by themselves. Sorry, but there is no "wonder pill" that will magically make you lose weight and keep it off.

I've used drug therapy selectively for weight loss in patients for the last 25 years and I'm very familiar with it. In fact, I have more experience with these substances than most practitioners in North America. What I've found over all these years is that drug therapy, in and of itself, is doomed to failure. It must be linked to lifestyle changes to be effective over the long term.

And I’m not alone in my views on diet pills. Studies presented in June 1999, at the ninth European Congress of Obesity (Milan, Italy) showed that the use of diet pills could confer very progressive and sustained weight loss, especially if combined with an effective diet and exercise program. In one study, patients on sibutramine (Meridia) lost more weight over those using a placebo and found significant reductions in waist and hip measurements and in cardiovascular risk factors such as high triglyceride and cholesterol levels.

The Problem With Diet Pills

Regardless of how enthusiastic some practitioners are on both their short and long term use, caution is the watchword when it comes to diet pills. They're prescribed far more frequently than they should be by today's doctors and are frequently rendered useless because they're not combined with a solid, long-term diet and exercise program. They can also deliver some serious side effects that you should be aware of before beginning any course of drug treatment.

The amphetamine and amphetamine-like anorexiants (appetite suppressors) make up the bulk of weight loss prescription products available today. The stimulatory effects produced by these substances are at the root of many of the side effects the user may confront. Dry mouth and the unpleasant taste left in your mouth by these products are the least of your worries. Insomnia, agitation, dizziness, irritability, headache and tremor (involuntary shaking) can also occur.

Sex drive may be affected. Anxiety disorders, or panic attacks, may occur in extreme cases. Disorientation, hallucinations, heart palpitations and tachycardia (an unusually fast heartbeat) may also strike the more sensitive user. Both phentermine and phenylpropanolamine use have been linked to stroke[186] in some research.

Even the natural substances used in over-the-counter or "folk" remedies can have similar stimulatory effects. Ephedrine, a natural substance frequently combined with caffeine and aspirin in weight loss products, is a good example. It can make you jittery and give you heart palpitations. Cardiac arrhythmia (irregular heartbeat), hypertension, hyperthermia (high body temperature) and even death have been caused in some cases of ephedrine abuse. That's why ephedrine products are being controlled in an increasing number of countries around the world.

The fact is that it's virtually impossible to find a diet drug without side effects. Even fenfluramine, the highly touted and relatively safe drug that took the diet world by storm, either alone or in combination with phentermine, has significant side effects. At minimum, fenfluramine can cause dry mouth, diarrhea and often some fatigue. Short-term memory loss, or the inability to remember events that occurred a day or even a few hours earlier, has also been reported in some patients. Pulmonary hypertension, a potentially fatal condition where blood finds it difficult to reach the lungs, has been reported in a few cases. And to top it off, in September 1997, fenfluramine and its partner in crime, dexfenfluramine, were taken off the shelves when it was discovered that they were responsible for some heart valve problems.

Addiction is also possible with diet drugs, especially with the amphetamine-like anorexiants. You'll find energy increasing with most of these substances. People find that they can do more and be more productive. These drugs can significantly increase the sluggish metabolic rate that can plague the dieter. People feel better, their mood improves and they find themselves better able to stick to their diet as a result.

Unfortunately, over time, the body can develop a tolerance for these substances. The body gets used to them and requires higher dosages to achieve the same effects. Doses may increase to an unhealthy level.

When you finally do go off the drug, withdrawal symptoms like depression, nausea, trembling and fatigue can occur. Your body may also find itself in a position where it can't naturally create the compounds that normally provide energy. This can leave you lethargic and even depressed for some time before the body repairs itself and resumes normal functioning.

The Diet Pill Delusion

It's vitally important to remember that pills will not properly get the weight off and keep it off. You need exercise and a good diet to do this. Sure, you'll find some people who've lost weight with drugs without any real lifestyle changes but they look terrible. They've been on appetite suppressants for years and they've lost weight but they've also gotten small and lost muscle tone. They're still soft and flabby. They've burned a lot of muscle up with the weight loss and now they look like a miniature version of what they used to be. They may even look worse.

Sometimes they'll begin deluding themselves into thinking they're some kind of weight loss expert, but all they've done is let the drugs do it for them. They haven't learned how to maintain their weight loss through proper diet and lifestyle changes. Take them off the drugs and you'll find out how much they know. They'll be in trouble all over again only this time they'll look even worse when they gain the weight back. There are innumerable studies in which people have been followed 2-3 years after discontinuing diet pills. They always gain the weight back unless they've got a sound diet and exercise program to see them through.[187]

The goal with the Metabolic Diet is to lose weight, tone up the body and keep the weight off. Shaping and maintaining a healthy body is the bottom line, not just phantom weight loss that makes you look like a prison camp survivor and then disappears as soon as you're off your medication.

Diet Pills and the Metabolic Diet

Despite their drawbacks, in recent years I've been quite impressed with the potential for weight loss in the morbidly or stubbornly obese when these appetite suppressants are combined with a higher-fat/lower-carb diet. It seems that anorexiants can work synergistically with the Metabolic Diet toward the goal of weight and fat loss.

Indeed, the ability of certain anorexiants to suppress appetite may depend largely on the kind of diet a person is on. A research base for this belief is developing. For instance, a recent study with laboratory rats found appetite being suppressed better with the higher-fat diet.[188] In the study, one group of rats was fed a diet high in fat, the other a high-carb diet. Both were given the same amount of fenfluramine. Food intake decreased markedly in the high-fat fed rats in comparison to the high-carb rats.

I've found very similar results in my own practice. Obese patients just don't seem to have those destructive, insatiable carb cravings when the Metabolic Diet and anorexiants are used together. I've also found the diet in combination with anorexiants to result in more weight and fat loss over time than the diet itself. Then, when the weight was lost, the lifestyle changes resulting from the diet were enough to maintain the loss even when drugs were discontinued.

Keep in mind that we're also trying to maximize the production of growth and fat loss hormones on the Metabolic Diet. In this way, we can firm up the body as we lose weight. It's been shown that anorexiants may increase growth hormone production.[189] Preliminary results show that anorexiants in combination with the diet can net a bigger increase in growth hormone response than we'd see with the Metabolic Diet by itself. For the extremely obese, diet and a carefully administered program of drug therapy together may be just what the doctor ordered for weight loss and ultimate health.

Recently I placed a severe morbidly obese woman (I'll call her Linda) on the Metabolic Diet and phentermine. She was 5' 2" and weighed 289 pounds. Her ideal weight is probably around 125 pounds, although we'll both be ecstatic with anything under 150.

She was 37 years old when she started the diet program and had tried all the other diets over the years. She weighed 135 pounds as a 9-year-old and had seen no real, lasting improvement in her weight since early childhood. By the time she was into her late teens her weight was over the 200-pound mark. When I saw her, her options were gastric stapling, a surgery I would avoid at almost any cost, and the high-fat/anorexiant program I prescribed.

Since beginning the diet a little over a year ago, she's lost more weight than ever before. She's now down to 205 pounds and feels and looks better than she has in her adult life. More importantly, over the last few months, while we've tapered off her

medication, she's kept the weight off. Now we're getting ready for the second phase of her weight loss program where we're going to drop her weight to around the 160-pound mark. For this we're going to keep her on the Metabolic Diet and use the anorexiant sibutramine because of its dual properties which should mimic the phentermine/fenfluramine combo that proved so effective before the fenfluramine was taken off the market.

But the diet pills can't do it alone. Without a proper diet and some lifestyle changes, the weight comes back on, sometimes even while the patient is still on the diet pills. Let's face it, losing anything close to 100 pounds and turning around and putting it right back on is not healthy. Yet, this is what happens with most people. Hormones and body chemistry jump around like a rubber ball when this happens. The elastic fibers of the skin break after a couple of diet yo-yo's and, even when you lose weight, the skin hangs. It's a very destructive situation.

But now, for the first time, Linda's been able to keep the weight off. We're continuing to work together in an effort to lose even more weight. Because I don't think it's advisable to keep people on drugs for a lengthy period, we've been cycling her anorexiants off and on. Linda spends periods where she's on the Metabolic Diet without drugs and she's been able to lose small amounts during these periods. When we've cycled her back on drugs, we've found that she starts losing more weight again.

Linda has found a new lease on life and she's achieved her success safely. Unfortunately, this is not the case with all drug therapy. There are doctors in the United States still prescribing digitoxin, a very dangerous drug, for appetite suppression. It may work, but you're taking your life in your hands when you use it. Other dangerous medications are also being prescribed and in some cases the people fully know the risk they're taking.

The fact is that these people are desperate. In many cases, their weight problem has ruined their lives. They'll do virtually anything to bring it to an end, even risk their lives. They are in that much pain. They've suffered that much. That's why they're such a mark for quacks and others who would mislead them or otherwise place their lives in danger.

Back in the early 1900's it was found that women working in wartime munitions plants were losing inordinate amounts of weight. On further examination it was discovered that a component of the munitions, dinitrophenol, was causing the loss.

Subsequently, dinitrophenol began to be prescribed for weight loss. Unfortunately, it was also later found that the substance had the ability to blind or even kill you. Sadly, some people were so desperate to lose weight that they were willing to take the chance.

I actually had a patient once who knew about the substance and said, "If I could be skinny, I'd take the blindness." And he was only half kidding me. People who don't have serious weight problems have no idea what goes on in the mind and life of an obese person. That's why I find the program based on safely combining anorexiants and the higher-fat/low-carb diet to be so exciting and why I'll continue to experiment and improve on it in the upcoming years. The change it can make in the lives of people like Linda is truly remarkable.

The Metabolic Diet is the key to this success. Unlike what occurs with other diets, once the pills have been stopped and weight stabilized the higher-fat/lower-carb diet is stunningly effective at keeping weight off and maintaining a consistent weight.

Antidepressants and the Metabolic Diet

We've already talked a bit about anorexiants and the Metabolic Diet. Weight loss and growth hormone production look to be much enhanced by the two working together. In addition, anorexiants appear to increase fat mobilization for energy and further spur the loss of body fat.

Similar results are occurring with antidepressant drugs like Prozac, which, like fenfluramine, increase serotonin activity in the brain. If people are on Prozac and want to lose weight and keep it off, the Metabolic Diet could be just what they're looking for. The two appear to complement each other quite well in a weight reduction program.

Indeed, Prozac itself has shown a tendency to decrease weight and suppress appetite in those patients who use it. The old tricyclic antidepressants like Elavil (amitriptyline) tended to increase weight but initial studies show the new serotonin-based antidepressants like Prozac decreasing it.[190]

As previously discussed, people crave carbohydrates because carbs increase serotonin levels in the brain that can lead to a feeling of well being. When people eat a high-carb meal, the increase in L-tryptophan provided by the carbs stimulates an increase in serotonin production.

However, it's possible that if you're not lacking in serotonin, you won't need to increase serotonin levels with a drug, and thus you won't have any carb cravings. After making the metabolic shift on the Metabolic Diet, you won't have those fluctuating serotonin levels and carb cravings become less of a problem.

Chapter 9: Types Of Weight Loss Products

Types Of Weight Loss Products:

Over-The-Counter Diet Pills

Over-the-counter (OTC) appetite suppressants (including both pharmaceutical products and nutritional supplements) are sold widely around the world. Although that's changing, these OTC preparations usually consist of a relatively small number of substances packaged in a large number of ways. They contain various combinations of compounds including vitamins, minerals, herbs, fiber, amino acids, and other compounds such as phenylpropanolamine (PPA) and benzocaine. There are also some specific foods that may be used in an effort to curb appetite or serve as low-calorie meal replacements.

Local anesthetics, usually benzocaine, are also found with frequency in OTC anorexiants. While they may numb the taste buds and make food less palatable, they generally have little effect on food intake.

Bulking agents like methylcellulose, carboxymethylcellulose, psyllium hydrophilic mucilloid, agar and karaya gum are often used in the belief that they'll create a sense of fullness so that you'll eat less. Generally, these substances have little effect on appetite or food intake.

Starch and fat blockers are also popular in OTC formulas. They block the absorption of starch or fat respectively from the stomach and small intestine, but most of these compounds have significant GI side effects such as abdominal cramps and diarrhea. In the end they provide little relief for the person in search of weight and fat loss.

In recent years the government in many countries has curtailed the use of amphetamines. This has led to the OTC market in some countries, especially the United States, being flooded with products that either look like or have names that sound like the now-restricted prescription amphetamines. Phenylpropanolamine is often an ingredient in these products. A number of vitamins and minerals may also be added to little purpose.

Hydroxycitric Acid or Hydroxycitrate

The general public has only recently become aware of hydroxycitrate (HCA). It hasn't seen much use yet, but it is a very promising dietary supplement that can be bought over-the-counter to aid in weight loss. While its effects aren't dramatic, it can be effective over the long term.

HCA is one of the few compounds that, like the Metabolic Diet, limits the amount of fat formed on the body by interfering with the fat-producing process. An enzyme important to fat production is inhibited by HCA. As you eat, you'll make less fat than you normally would from the food eaten.

Indirectly, HCA also seems to lead to increased fat breakdown and consistently decreases appetite. The substance may also be very helpful during the weekend carb-loading portion of the Metabolic Diet. It increases glycogen loading by the body and stabilizes energy levels. The natural body toning and shaping capabilities of the diet are thus enhanced while the fluctuating energy levels that can make you a couch potato during carb-loading are controlled. HCA also appears to increase insulin sensitivity for toning without activating its fat-producing machinery.

In one study, HCA and other tricarboxylic acids were shown to inhibit fatty acid synthesis from body glycogen without affecting protein synthesis.[191] Bottom line, HCA provides many of the same advantages of the Metabolic Diet. The two working together to aid in fat loss and body toning hold much promise.

A caution here, HCA is not a drug. You're not going to take it and immediately lose 10 pounds of fat. Where HCA seems to work well is over longer periods of time. I am using it with some of my patients now and am seeing some definite results. HCA should be taken in 750-1000 mg dosages three times a day, preferably 1/2 hour before meals. Research has indicated that HCA appetite suppressing effects do not occur if the HCA is taken after meals. Make sure to take it before you sit down to eat.[192]

Natural Appetite Suppressants

You'll also find an array of natural appetite suppressants on local drug store and supermarket shelves. They usually include one of the following: grapefruit extract, cider vinegar, kelp, pyridoxine (vitamin B6), spirulina, lecithin, brewer's yeast, L-phenylalanine, L-tyrosine and L-ornithine (amino acids) and even garlic. Unfortunately, the formulations so far have not had much of an effect on weight loss other than a minor placebo effect - i.e. if you believe they work, they will work. At least for a while.

Caffeine is often found in these natural formulas. In fact, phenylpropanolamine was combined with caffeine in weight loss products for a number of years. This combination is no longer allowed in most countries although this hasn't stopped people from taking caffeine tablets along with their phenylpropanolamine if they so desire.

The ECA Stack

Ephedrine is often combined with caffeine (and sometimes aspirin) in several weight-loss products. The combination of ephedrine/caffeine/aspirin (commonly known as the ECA Stack) has been found to be effective for weight loss likely through a combination of its mild anorexiant and thermogenic effects.[193] Besides decreasing appetite and increasing energy loss, there is evidence that the ECA stack helps maintain lean body mass and lose body fat.

Ephedrine provides a stimulant effect somewhere between what you'd find with adrenaline and amphetamines. When used with restraint (usually in 20-30 milligram doses with no more than 90 milligrams being taken during the day) athletes and others have successfully used it to stimulate performance and curb hunger.

Several studies have shown the efficacy and safety of ephedrine and ephedrine, caffeine and aspirin combinations in aiding weight loss.[194] Ephedrine and similar substances directly and indirectly stimulate the beta-adrenergic receptors of the central nervous system and on other tissues of the body. Its direct effects on the nervous system induce excitation in many people. But this also causes an increase in epinephrine and norepinephrine in the body. These are the main hormones responsible for burning fat in the body.

Several studies suggest that adding caffeine and small amounts of aspirin to ephedrine provide greater results than when ephedrine is used alone. However, this combination appears to have its most pronounced effects with obese people rather than those who are relatively lean. As well, the majority of studies show that the ECA stack can have marked effects on weight loss especially if combined with a restrictive diet and exercise. The general consensus is that the ECA stack is safe as long as it is used as directed. The 'more is better' mentality can lead to many potentially dangerous adverse effects such as heart palpitations, cardiac arrhythmia, hypertension, tremor and rarely death. For the drug-sensitive, even lower amounts could cause significant problems, so it's best for anyone using the combination to start off at the lowest recommended doses.

There are many products on the shelves that provide the ECA combination, but are derived from botanical sources. These sources are MaHuang (ephedrine source), kola nut or Guarana (caffeine source), and willow bark (aspirin source). These may be viable alternatives for the dieter wishing to use a thermogenic compound, but the user should not assume that they are any safer than the synthetic forms. Thus, the same cautions regarding usage should be applied to these botanical alternatives.

Yohimbe

Another useful fat loss aid is yohimbe. Yohimbe is a botanical that is receiving increased attention of late. As well, the synthetic form, yohimbine, is added in small amounts to several over-the-counter fat loss products. While this substance can be beneficial on a weight loss program, it must be used cautiously for several reasons. While ephedrine stimulates the beta-adrenergic receptors, yohimbe blocks activity of the alpha2-adrenergic receptors. This results in stimulating the sympathetic nervous system and increasing the levels of norepinephrine released from nerve endings in the body. This aids fat loss in several ways. It increases the fat-burning hormones in the body and dilates the outer-lying blood vessels so that these hormones are delivered to subcutaneous body fat.

A few studies demonstrated good results in fat loss with use of yohimbine, but there are several that have not. One of the primary considerations in the use of yohimbine is that it can increase insulin release in the presence of blood glucose. Therefore, ingesting yohimbine with any carbohydrate-containing foods will increase the insulin response more than normally seen. Therefore, it is best to use yohimbine only several hours before or after a carbohydrate-containing meal. Several researches did not account for this in their studies, which may be the reason for lack of results.

Aside from the insulin response of yohimbe, using yohimbine and the botanical source, yohimbe, can also have other problems. One of the significant side effects of yohimbe is increased heart rate. As with ephedrine, if you decide to use yohimbe, start out with small doses and assess how you respond. As well, be aware that using yohimbe during any exercise will elevate heart rate higher than normal. It is suggested that you carefully monitor your heart rate while exercising, decreasing your exercise level if heart rate increases too high.

Another word of caution is to be careful when dosing yohimbe or yohimbine with ephedrine. Using too much yohimbine with ephedrine can cause some serious side effects. Yohimbine should not be used with some heart medication, or medications classified as monoamine oxidase inhibitors (MAOIs), such as some anti-depressants.

Thermo and Resolve both contain ephedrine and yohimbine in very conservative doses and as such these formulations, when used as directed, can safely be used by most anyone wanting to lose weight and body fat. In some cases where other medications are used a doctor should be consulted to make sure that there are no potential problems.

Competitive athletes who train and compete under NCAA and IOC rules, which require mandatory drug testing, should also not use any compounds containing ephedrine. The use of ephedrine by these athletes can result in a positive drug test. Recognizing this and also realizing that there are some people who cannot take ephedrine and/or yohimbine, MD+ Nutrition has included Resolve Competition in its lineup of nutritional supplements. Since Resolve is part of Exersol, the complete training solution, MD+ Nutrition has also included Exersol Competition in its nutritional lineup. Both of the Competition formulations are free of ephedrine and yohimbine, but have other natural ingredient added to increase their thermogenic effects and as such make up for the lack of both ephedrine and yohimbine.

Summing up, when used properly and not abused, formulations containing compounds such as ephedrine, caffeine, yohimbine and many other natural compounds have some potential to increase weight and fat loss and maintain or increase lean body mass. Discriminate and proper use of fat loss aids can be safe and effective especially when combined with the Metabolic Diet and exercise.

Chapter 9: Prescription Diet Pills

Prescription Diet Pills

The truly effective diet pills are either amphetamine derivatives or compounds that have similar effects on the body. These substances can generally only be obtained by prescription. Research and practice have demonstrated them to be very effective in reducing hunger in both animals and humans. They also cause a slight rise in the basal metabolic rate (the amount of energy used to keep the body functioning) and thus aid in burning more calories.

These substances decrease appetite by increasing the release of certain chemicals in the body known as "neurotransmitters". Though the exact function of neurotransmitters in appetite is still being researched, they appear to be very important in moderating hunger. Most of the amphetamine derivatives now being used affect the neurotransmitters norepinephrine and dopamine. Others, such as fenfluramine affects serotonin.

Obviously, the ideal diet pill would decrease appetite, increase calories burned and perhaps decrease the absorption of food already eaten. You'd also want the pill to have no side effects so that it could safely be used over a long period of time. Unfortunately, this pill doesn't exist, although the manufactures of some diet pills may tell you otherwise.

Though many of today's diet pills have few overall side effects when used properly, most still retain significant stimulant effects. With the exception of fenfluramine (which can make you sluggish and quite drowsy), it's proven impossible so far to separate appetite suppression from stimulation.

There is an "up" side to this, however. Most people who use amphetamines or amphetamine derivatives for weight loss feel that the stimulation of the central nervous system these drugs bring helps them fight off the lethargy and depression that can accompany a diet. It can also give them new energy and enthusiasm for an exercise program or the diet itself.

Still, the use of amphetamine-like drugs for weight control has remained controversial because of their potential for abuse. This potential, and the resulting drug dependence, is believed to be proportional to the drug's stimulant properties. The more the change in mood or "jolt" a person gets out of the substance, the more likely he is to become reliant on the drug. The safest diet compounds are believed to be those classified as having the least potential for psychomotor stimulation.

The prescription anorexiants that work systemically (as against compounds that work in other ways such as Xenical [orlistat], a compound that decreases the absorption of dietary fat) and are widely used in Europe and North America today include chlorphentermine, diethylpropion, mazindol, phentermine, sibutramine, fenfluramine and dexfenfluramine.

The latter two were both banned in North America in 1997 because of the potential to cause heart valve defects. All of these compounds cause less stimulant activity and are thus thought to have a diminished potential for abuse by a user. In reality, though, the potential for abuse in all of these drugs, except perhaps for fenfluramine and dexfenfluramine, is quite substantial, with chlorphentermine, phentermine and diethylpropion being the worst offenders. They are never recommended for children under 12 and would only be used very selectively, if at all, for teenagers.

One of the problems in prescribing these drugs is that people have widely different sensitivities to them. I've found this particularly true in my own practice. I recently had a patient under my care that was remarkably sensitive to these substances. Instead of the single tablet that most people seemed to have little trouble with, this person could only handle a dosage considerably scaled back from the norm. She'd take a small flake off a standard tablet, maybe 1/10th of the normal dose, and get the same results as most other patients taking the whole tablet.

The fact is that there are widely varying individual sensitivities to most drugs. These individual differences must be taken into account when prescribing them. Too often, they're not. Any diet pill program must be monitored closely by a physician for this reason, as well as several others.

Because of the potential for abuse, the more addictive amphetamines and amphetamine-like drugs are no longer recommended or permitted for use as appetite suppressants. North America, Australia, Japan and most European nations have stringent controls on them.

The only drugs legally available for weight loss in North America and England are the prescription drugs diethylpropion, mazindol, phentermine, sibutramine and orlistat, and over-the-counter drugs including ephedrine (especially combined with caffeine) and phenylpropanolamine.

Chlorphentermine was discontinued in both England and North America but is still available in some other countries, as are the more addictive amphetamines. All five of the available drugs are effective anorexiants although the prescription drugs are more effective than the OTC phenylpropanolamine. They all differ in their effect on the central nervous system and severity of side effects.

Phentermine

Phentermine is used both by itself and, at times, in combination with other anorexiants. Phentermine can cause insomnia, irritability and anxiety but these effects are limited when it was used with fenfluramine or even dexfenfluramine (both no longer available). Fenfluramine, and dexfenfluramine on the other hand, can cause sleepiness and lethargy but phentermine acts to counterbalance these effects.

The use of the phen/fen (phentermine and fenfluramine) combination in selected patients was an effective weight loss combo and was cited in several studies.[195] Even though the media and popular magazines (including the August, 1995 issue of Reader's Digest) picked up on this phenomenon and treated it as a new treatment for obesity, this was certainly not the case.[196]

The combination of these two anorexiants seems to have a synergistic effect on decreasing appetite. As well, the adverse effects of each drug seem to almost cancel themselves out. For example, fenfluramine often causes some fatigue and sleepiness while phentermine often causes over stimulation and difficulty sleeping. Using the drugs together evens out these effects so that there are fewer problems. Although some doctors cited the increasing use of this drug combination as a good example of overmedication, its popularity continued to increase.

The effectiveness of the phen/fen combo has prompted many nutritional supplement companies to come up with phen/fen alternatives such as herbal phen/fen. These combinations, often involving the use of an ephedrine like compound with St. John's Wort, proved to be much less effective that the original prescription combo.

Phentermine, on its own, is available only in timed-release form. It's prescribed as Ionamin (in both 15 and 30 mg dosages), Fastin (30 mg), Duramine (15 and 30 mg), Teramine (30 mg) and Adipex-P (30 mg). The medication is generally taken sometime between breakfast and noon. Phentermine was available in a shorter acting tablet form at one time but this formula has been discontinued.

Diethylpropion

Diethylpropion has very similar anorexiant effects to phentermine but has less of a stimulatory effect on the central nervous system. Thus, it's less likely to cause the irritability and insomnia seen with phentermine.

Diethylpropion is available in 25 mg tablets as Tenuate and Tepanil and in 75 mg sustained-release tablets as Tenuate Dospan and Tepanil Ten-Tab. In England, diethylpropion and several B-vitamins are combined in a 75 mg sustained-release tablet called Apisate.

Mazindol

Mazindol is very popular as an anorectic. It's not an amphetamine derivative but it possesses many amphetamine-like properties. It has a lessened potential for abuse due to its limited affect on central nervous system stimulation. The main effect of mazindol seems to be in decreasing food intake through suppressing feeding centers in the hypothalamus.[197]

Mazindol side effects are usually mild and short-term. You may get a "dry mouth" and experience insomnia and dizziness but this soon improves after a few days on the drug. Mazindol's ability to stimulate the cardiovascular system is less than that of phentermine but more than diethylpropion and fenfluramine. Mazindol, unlike the other prescription anorexiants, has little effect on fat metabolism although it can be thermogenic (stimulating brown fat) and increase oxygen consumption. It is available in 1 and 2 mg tablets as Sanorex or Mazanor. The tablet is taken in the morning and appetite suppressing effects usually last 10-14 hours.

Fenfluamine

This compound was first used in France and has been thoroughly studied in trials around the world. It is no longer available in North America and some other countries but is readily available in others, in 20 mg tablets as Ponderal, Ponderax and Pondimen and in slow-release 60 mg tablets as Pondimin Extentabs. Slow-release 60 mg capsules are also available as Ponderal Pacaps and Ponderax Pacaps. Although it's an amphetamine derivative, fenfluramine (and dexfenfluramine, the dextrorotatory stereoisomer of fenfluramine - approved in the USA in late 1995) provides far less stimulation for the central nervous and cardiovascular systems that other appetite suppressants. In fact, it can have sedative like effects. Unlike the other drugs, fenfluramine and dexfenfluramine don't affect the neurotransmitters norepinephrine and dopamine but instead have an influence on serotonin levels.[198]

An inadequate release or level of the serotonin neurotransmitter seems to play a big role in food cravings and compulsive eating. By stimulating serotonin it’s believed that the cravings can be controlled and appetite successfully suppressed. So far, fenfluramine has demonstrated itself to be remarkably effective in these areas, although causing serious problems in other areas. As well, there is some evidence that dexfenfluramine, like the Metabolic Diet, may improve PMS.[199]

Meridia (sibutramine)

Various drugs that affect the central nervous system are being studied for their possible effect on weight loss. For example, sibutramine, an antidepressant that is a non-selective monoamine reuptake inhibitor, has been shown to useful as part of an overall weight loss program.[200] In the past few years sibutramine has become the new wonder kid on the diet pill block. Sibutramine seems to have the same effects of the phen/fen combo without the heart and lung side effects.[201] Sibutramine prevents the reuptake of serotonin and epinephrine in the central nervous system without causing an increase in serotonin release from nerve cells. Overall, it has effects on both the serotonin and adrenergic neurotransmitters, few side effects, and is not as addictive as the amphetamines and the amphetamine derivatives like phentermine. Recently sibutramine, and its metabolites has been found to also have significant thermogenic effects.[202]

Because sibutramine use presents a risk of physical and psychological dependence, it has been classified as a controlled substance in Schedule IV of the Controlled Substances Act (CSA). According to prescribing information, sibutramine can slightly increase average blood pressure in patients who are normotensive and can cause even higher increases in some patients. The FDA recommends that patients on sibutramine receive regular blood pressure monitoring. No cases of primary pulmonary hypertension have been reported.

Do They Work?

In my own practice I have found that the use of the prescription diet pills can lead to a greater reduction in food intake when combined with the Metabolic Diet rather than when used alone. So while they do sometimes help it's important to remember that they're not wonder drugs. If you stop taking them without making the necessary lifestyle changes, you're going to gain the weight back. And while some doctors may advise life-long diet pill use, I believe that they should only be prescribed in cycles until the necessary weight is lost.

Although I favor the long-term use of anorexiants for some patients, I also agree with those that believe that anorectic drugs should be reserved for those who are clinically at risk from being overweight, like the morbidly obese, and then only as part of a comprehensive weight-reduction program including regular diet counseling.[203] Drug use is never innocuous. They always have adverse effects, and these effects may increase or become more likely with long term use. If you don't need to use them then you shouldn't.

Also, I've found that the extended (or in some cases even short term) use of diet pills, especially in combination like the once popular phen/fen diet pill combination (phentermine and fenfluramine used together) can case addiction. Once they are discontinued patients invariably suffer withdrawal reactions sometimes necessitating the use of antidepressants such as Prozac in order to deal with the depression secondary to serotonin depletion.

My findings are in line with a recent study that evaluated the effect of this diet drug combination on brain serotonin levels.[204] In this study done on rats the combination of phentermine and fenfluramine, although more effective for weight loss than either drug used alone, enhanced the depletion of serotonin and were more neurotoxic on 5-HT (serotonin producing) neurons than the use of either phentermine or fenfluramine alone. As well with diet pills, unless coupled with successful behavior modification (such as changing for the better a person's lifestyle so that he or she eats differently than before they began dieting and makes exercise an integral part of their life) weight loss is only maintained as long as medication is continued[205] and body weight tends to dramatically increase a short time after the diet pills are discontinued.

The bottom line is that while diet pills can help you to lose weight and keep it off, the side effects of these drugs make them an alternative only in the morbidly obese (although some will argue that any degree of obesity can make a person morbid) or those few where nothing else seems to work.

It's starting to look like wishing and hoping and magic pills just won't do it. You have to actually make some dramatic changes in your life if you want to look good. The answer doesn't seem to be some faddish food or pill. No matter how promising it seems, the only way to lose weight, increase lean body mass and get rid of excess body fat is to take the time and energy to do it right.

So what does work besides dedication and hard work?

Well we still haven't dried up the well. Upcoming solutions to obesity include opiod antagonists, cholecystokinin (CCK), neuropeptide Y (NPY), and leptin. The tendency of people to develop tolerance to the present anorexiants is one critical area now being confronted. There has been some initial success with the opioid antagonist LY255582. Obese rats put on this new diet medication showed no tolerance to its weight loss and appetite suppressant effects, while tolerance to conventional anorexiants developed over several days.[206] It's hoped that it may one day be useful for the long-term treatment of morbid obesity.

Cholecystokinin (CCK), a peptide hormone produced by the gastrointestinal tract and released in the body, produces a dose related decrease in food intake. As noted earlier, CCK is increased naturally in the Metabolic Diet since both fat and protein, but not carbohydrates, increases the natural production of CCK.[207]

However CCK taken by mouth is broken down in the gut to its constituent amino acids and rendered useless. It is ineffective as an oral weight loss aid. Efforts are being made to introduce sublingual forms of CCK, as well as analogs of CCK that will be effective orally. Unfortunately CCK has been a candidate for weight loss fad of the year for over a decade. As yet no one has been able to run with this one so don't hold your breath waiting for the CCK bandwagon.

The Genetic Solution

In the past few years research has centered on genetic solutions to obesity. Leptin started it all when a report on a "fat" gene appeared in the July 28, 1995 issue of *Science*. Leptin is a protein product of this fat gene and has been successfully used to treat genetically obese mice. Preliminary studies found overweight mice given daily injections of the hormone burning off excess fat while retaining lean body tissue.

Leptin seems to decrease appetite and increase energy use in these genetically obese mice. Although it has been shown that obese people express much larger amounts of the messenger RNA for the ob gene in their fat cells than do lean people, it's doubtful, that leptin would be of any use for weight loss in most overweight people. Except for perhaps a miniscule number of people, the genetic involvement in weight control is more complex than the simple gene abnormality seen in these obese mice.

Neuropeptide Y

Although leptin has stolen the spotlight, NPY may be the more potent factor in human obesity. Neuropeptide Y (NPY) is a supposed neurotransmitter abundant in the brain and has been implicated in the regulation of energy homeostasis by stimulating food intake and lowering energy expenditure. It has been shown to act within the hypothalamus, inducing a powerful eating response and a specific appetite for carbohydrates, even in gorged animals.[208,209,210] NPY induces a strong feeding response when it is injected in the hypothalamus, stimulating both carbohydrate and fat intake. Diets rich in either macronutrient are known to induce obesity and to modify feeding behavior.[211]

These findings, demonstrating that exogenous NPY is capable of overriding mechanisms of satiety and body weight control, suggest that disturbances in NPY function may play a role in some disorders of eating behavior and body weight regulation.[212]

Some of the diet pills and antidepressants that increase serotonin levels have a positive impact on weight loss. This response may be mediated by decreases in neuropeptide Y. In one study it was found that a serotonin antagonist-induced feeding is associated with increased activity of the NPY neurons.[213]

While no research as yet has focused on NPY, it seems logical to try and develop NPY derivatives that tie up the NPY receptors but don't have the hyperphagic effects so that the overall response from endogenous NPY would be blunted. As well, it makes sense to determine if any special diet, natural supplement or even drug has an effect on decreasing NPY production or biological action.

Beta-3-Adrenergic Agonists

Another genetic solution to obesity may center on defects in beta-3 adrenergic receptors. If these receptors are defective, then it's possible that fewer calories are needed to maintain weight. Thus weight gain is more likely and weight loss more difficult. Although drugs such as clenbuterol (a drug used for asthma in many parts of the world but not in North America) and ephedrine have some beta-3 agonist effects, more specific and thus more effective beta-3 agonists may soon be commercially available for weight control.

Several other drugs are also currently being investigated. These include drugs that block the absorption of fat from the food a person eats, and drugs that increase metabolic rates and calorie burning as well as suppress the appetite. These, and other drugs and treatments, may one day provide the totally safe, effective drug dieters have long searched for. However, final testing and approval is many years away.

Drugs Aren't Necessary For Most

All told, drugs should not be relied upon for most people to lose weight. A combination of the Metabolic Diet and exercise, perhaps coupled with selective nutritional supplements, should be enough to get the weight off and keep it off. Unless you're morbidly obese, or unusually resistant to weight loss by natural methods, drugs should not be a part of your weight loss program.

Chapter 10

Lifestyle

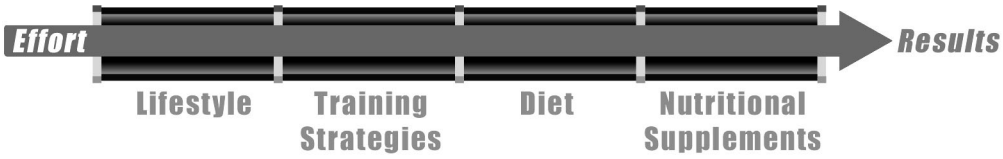
Chapter 10: The Metabolic Pipeline

Lifestyle

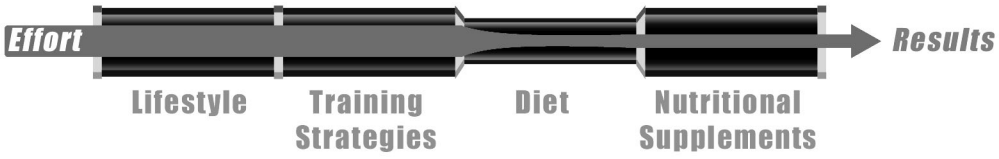
While diet and exercise are extremely important, there are other factors that can help in maximizing weight and fat loss while at the same time maintaining or increasing muscle mass.

The Metabolic Pipeline

It's important to realize that it takes a holistic approach to reach your goals. All four factors - lifestyle, training, diet and nutritional supplements - must be in synch before you can maximize the effects of your diet and training. Only by getting all four in order can you take your performance and body composition to new heights.



If everything is in synch then we'll achieve our goals, as long as they are realistic.



A weak section in the pipeline will decrease the end results.

Thus, reaching your dietary goals takes a structured approach that looks at lifestyle, exercise, diet and nutritional supplements. Since we've already looked at the diet and exercise components, we'll concentrate on the lifestyle factors and on the nutritional supplements.

Lifestyle

In order to manipulate the body's endogenous hormones to ensure that maximum fat is burned and the body is firmed, a person's lifestyle has to be brought under control. Reducing emotional and psychological stress leads to increased testosterone and decreased cortisol levels (remember, cortisol breaks down muscle tissue). Stated most simply: stress makes it more difficult to shape your body and easier to break it down.

You'll also need sleep. While some people can get away with as little as six hours or less a day, most people need at least seven and sometimes up to ten hours a day. This can be done either straight through at night or with a 6-8 hour stretch at night and a 1-2 hour nap in the afternoon. Sleep deprivation adversely affects hormone function.[214]

Recreational drug use must also be curtailed. Marijuana[215,216] and cocaine[217] have been shown to decrease serum testosterone. Though I allow for a beer or two during carb loading sessions of the diet, it's best not to overdo it. Alcohol also lowers critical hormone levels, such as the sex hormones and growth hormone.[218,219,220,221]

During the weekdays, the occasional drink isn't a problem. In fact, because of the possible cardiovascular benefits,[222] I often recommend that my patients enjoy a glass of red wine a day, usually with their supper. However, chronic alcohol intake is also counterproductive for the Metabolic Diet since it doesn't encourage the fat burning metabolism that we're trying to establish.

In order to set up a foundation for the body you want, you have to optimize your lifestyle. That means keeping stress at bay as much as possible, getting proper sleep, and keeping away from excesses of alcohol and recreational drugs.

Nutritional Supplements

The goal of the Metabolic Diet is to give you a sensible, lifelong program for weight maintenance and fitness. We've already told you how the diet decreases appetite, burns body fat and manipulates key hormones in the body to limit body fat levels and provide a foundation for body toning and shaping. We've also told you about the importance of exercise in any strategy for shaping the body and maintaining a firm, fit look.

While diet and exercise are the two major components to any weight control program, there's one more piece in the puzzle that often goes overlooked or misunderstood: nutritional supplements. If you're going to go "all out" in your effort to reinvent your body, nutritional supplements will be a necessity. Even if your goals are more modest and you're simply looking to lose weight, keep it off and increase your chances for health and a long life, supplements can play a key role.

Chapter 10: Lifestyle

The Dreaded Plateau And Nutritional Supplements

Almost any diet, as long as it cuts back on the usual calories, will result in weight loss. The problem with almost all diets is that sooner or later they stop working for one reason or another.

The ideal diet would keep on going and result in long term weight loss beyond the usual three to six month weight loss window. It seems that no matter what diet you go on and how charged up you are, you stop losing weight after about three to six months depending on your diet, enthusiasm and other factors. During these months your body adapts to the effects of your diet, supplements and diet drugs, including those containing ephedrine, yohimbine, and various other effective nutritional aids.

From my thirty-five years of experience dealing with diets and dieting, I've found that if you follow the same regimen day after day, your body soon gets used to the routine and you stop losing weight. If you then become frustrated and stop dieting, your weight can soon return.

The key phrase in all this is "if you follow the same regimen." *The Metabolic Diet* blows some of this away because it's a phase shift diet. That is, you're not on any one part of the diet more than five or six days at a time. This has profound effects on the body including the various hormones. For example, when calories are restricted for more than a few days T3, the active form of thyroid hormone, levels drop which in turn lowers your basal or resting metabolic weight. This means that you need less calories to maintain your weight and need to drop your calories even further to lose weight. With the Metabolic Diet the carb days counteract the effects of the low-carb, lower calorie days and bring the T3 levels back up to normal. This scenario happens with many of the hormones and body processes. The end result is that the body has a harder time getting used to the diet and subsequently aborting further weight and fat loss.

As well, by using specific nutritional supplements and using them in a cyclical fashion, we can further delay the body's adaptive processes and achieve significant weight and fat loss for prolonged periods of time. For example, in a study using diet pills, the intermittent use of a diet pill actually resulted in a greater weight loss than if the same diet pill was used every day.[223] Also, the use of certain nutritional supplements can affect the adaptive response and complement the effects of the Metabolic Diet. For example, ephedrine was shown in trials to help maintain and perhaps even raise T3 levels when dieting.[224,225] The use of these substances in a cyclical fashion also increases long term weight and fat loss. For example, Cellusol 1-2-3™ weight and fat loss solution comes with three different formulations. Each formulation is totally different than the others and each is meant to be used for 2 weeks in a six-week cycle of supplements. The third cycle being a normalizing cycle and along with the Metabolic Diet allows the body, including all hormone levels to return to normal, readying the body for further weight and fat loss.

Tricks Of The Trade

While many people realize the benefits supplements can provide, most have very strange ideas about what works and what doesn't. In many cases the only information available to them comes from the people who manufacture, distribute, and retail the supplements they buy and, guess what? They're going to do everything they can to get you to buy their product.

When dealing with supplements it's important to understand that the supplement industry is market driven. A lot of what you get in a supplement is determined by the way a company wants to market or sell a product.

"Perceived value" is a critical factor here. The supplement industry is a type of "It's not who you are that matters, it's who people think you are" enterprise. Products are often sold by taste, color and what makes for a provocative label. Whether the product is of real value can be another subject entirely.

Much marketing is based on "buzz words" or an "ingredient of the month club" mentality. If a company can come up with a catchy name for a product they know they've got a better chance of hooking you long enough to read an advertisement or label and get you to buy a product. Unfortunately, the names they come up with for these products can be a lot better than the product itself. If someone's touting "Fataway X" as a "metabolic optimizer" with "anti-catabolic action" and they're not defining their terms or product, you may well be having your leg pulled.

Then there are the endorsements by doctors, athletes, movie stars or other public figures that accompany many advertisements for supplements. In some cases, the endorser may actually have tried the product and found it useful. In others, they haven't. In still others, they may have a financial interest in the product, which places them in a "conflict of interest" position as far as telling you the truth.

You also have to keep in mind that journalism and financial interest often meld together in this society. You may find articles in a fitness, exercise or health magazine touting a particular formula and later find out that the magazine owned a piece of the formula. Sometimes it's difficult to tell the difference between advertisements and the actual editorial content of a magazine.

False and misleading claims also abound in the supplement industry. Previously, you'd just see this kind of abuse in the magazines, but these false claims have only increased considering all the TV infomercials and other advertising you see as the industry continues its explosive growth.

Research studies, one of the strongest allies in advertising any product, are often misinterpreted to get you to buy a product. For instance, a widely-quoted study[226] was used to trumpet the success of a substance known as boron in stimulating hormone

production in men and women. The actual finding of the study was that boron raised hormone levels in postmenopausal women. There was no evidence in the study that hormone production in men and (other) women could be stimulated by boron. In fact, there is evidence out there that it doesn't. An example is a study at the University of Arkansas, that shows boron does not raise blood levels of testosterone, increase muscle size or decrease body fat in bodybuilders.[227] Yet a universal claim was made and, chances are, unless you were a postmenopausal woman and bought the substance, it didn't help.

Another misrepresentation of research is that optimal dosage amounts will often go ignored in the development of a formula. A supplement producer may be very interested in an ingredient, but once he finds out how much the ingredient costs, he'll cut back on the amount used to the point that it becomes ineffective. He'll continue to extol the research fully as far as what the ingredient can deliver, but he won't bother to tell you that it takes several times the amount you'll find in one of his capsules to get the effects the research quotes.

In some cases, the manufacturers won't even bother with the research. Some claims originate in little more than some fellow's imagination. This has been especially true with the nutritional, herbal, homeopathic and glandular products targeted at people wishing to add strength and muscle tissue. For example, in order to lure the muscle mass conscious crowd a number of products are advertised as being more effective than anabolic steroids but all claims are totally unsubstantiated by research. While most of these formulas may be safer than anabolic steroids, they're also ineffective.

There's a kind of "placebo" effect that can occur with supplements. A person may begin taking them at the same time he/she happens to start an exercise program or get his/her diet and lifestyle in order. Improvements may occur in overall fitness and he/she may think that the results come from the supplements when they actually come from increased exercise and diet efforts.

The key point to keep in mind when dealing with any supplement is be critical. Before jumping in the air and announcing to the world how good a supplement is, take a critical look at the benefits you think you've received from it. Study your progress to see if you've really gone beyond what you would ordinarily expect from the diet and exercise program you're on. Is your body really shaping up more than you would normally expect? Are you really gaining stamina from the supplement or is your increased enthusiasm and commitment the source of your improvement?

The supplement manufacturers make enough ungrounded claims all by themselves. There's no need for you to help them out. Be critical. Study your overall progress, your diet and exercise program. Then, if it's proven to you that the supplements are giving you an edge, you'll know you've got something that really works.

It's also important to remember that supplements don't work of and by themselves. They do not take the place of proper training, diet, and lifestyle. They also don't work "overnight". They work slowly and their effectiveness is largely determined by the way they interplay with your diet and overall lifestyle. They also must be targeted for specific diets and must be taken at the right time and in the right dosages.

The supplements that I formulated and recommend are targeted specifically for use with the Metabolic Diet. Many of these supplements would have some of the same effects if they were to be used with a high-carb diet. But when used correctly, they'll work synergistically with the diet, exercise program and lifestyle to burn fat and firm you up.

The Medical Community Hasn't Helped

As you can see, supplements can play a big role in the Metabolic Diet or any health-conscious approach to modern living. It's regrettable that the public hasn't been provided with a better system for consumer information on supplements than they have. But, it's not only the supplement manufacturers who must bear criticism for this. The medical community itself, of which I'm a member, has also failed to meet their responsibilities in this area.

Without any marketing axe to grind, they could have done a huge public service by investigating individual supplements. Instead, researchers at universities and medical centers have largely chosen to ignore the whole subject (although there are some notable exceptions). They've been saying for years that nobody really needs supplements and that good nutrition was more than enough to insure health and fitness for everybody.

Recently, they've begun to change their tune. Athletes were the first people recognized to have individual needs beyond the normal person. Now the needs of the "normal" person are being investigated. The medical community is just now recognizing the potential of supplements. Much work remains to be done in investigating these substances and determining which can be put to good use and in what circumstances they should be used.

For over 35 years I've been involved, personally and professionally, in studying nutrition and finding natural methods to enhance fitness and physical performance. Supplements have played a big role in this quest. For those on the Metabolic Diet who wish to decrease fat levels and reshape their bodies, supplements can help stimulate and manipulate hormone levels to create the best possible environment for reinventing the body.

But there are reasons beyond this for you to seriously consider supplements in your regular lifestyle. The first is to help your body make up for any deficiencies it may have. This is true even for those not on the Metabolic Diet. With the preponderance

of fast food in today's diet and the nutritional pitfalls this can bring, supplements may be necessary in providing maintenance levels of certain vitamins and minerals. Many meals, especially breakfast, may even go entirely missed during the day creating an additional need for nutritional safeguards.

Similarly, the increased exercise you'll do in conjunction with the Metabolic Diet may create an additional need for certain vitamins and minerals. Significant quantities of potassium and zinc, for instance, can be lost through sweat and urine. Magnesium, sodium and iron may also be negatively impacted in people who exercise for prolonged periods of time in hot weather.[228]

Chromium, which has been shown to be essential in both carbohydrate and fat metabolism, can also be a problem. Since the need for chromium increases with exercise and modern diets provide little of it, it can become depleted among more active people. I severely doubt whether it does all the things they're claiming it does on the TV infomercials, but I would prescribe it to those on the Metabolic Diet as a precaution against any possible deficiency affecting fat metabolism.

Our environment may contain pollutants that affect the quality of the food we eat and may not provide for our needs. Poor agricultural practices, industrial waste dumping and indiscriminate disposal of urban wastes can have a great effect on the quality of food available. Soil erosion can also impact nutrients. As well, the use of chemical fertilizers often allows the depletion of trace elements and minerals in the soil. Thus, the quality of grazing conditions for cattle may vary widely and influence the overall quality of meat.

By using supplemental vitamin and mineral compounds, we hope to clear up any deficiencies that may arise in these areas. As such, they can serve as a kind of nutritional insurance policy. If you do have deficiencies, supplements will clear these up. If you don't, the compounds you'll be supplementing won't hurt you and they'll give you the security of knowing you won't have to worry about nutritional problems that can negatively affect your health.

Another area important in the decision to use supplements is that of preventive nutrition. Many of the compounds that I've formulated (Appendix 3), especially the antioxidants, can be valuable in protection against life-threatening illnesses like heart disease and cancer that affect so many in our society.

Vitamin And Mineral Supplements

You should start your supplement program with daily multiple vitamins. We're not talking about the kind named after some cartoon character, either. We're looking for serious nutritional supplementation for adults who want to maximize general health benefits and bodyshaping capabilities.

Some of the ingredients will be 10-15 times the U.S. Recommended Daily Allowance, but that should tell you something about the RDA's. They're simply not applicable to an increasingly diversified general public and certainly not to those on the Metabolic Diet who are exercising and doing their best to lose fat and tone their bodies.

I formulated the Multivitamin and Mineral (MVM) supplement to provide everyone with what I consider to be a baseline level of all the important vitamins and minerals. When you examine the ingredients of MVM you'll note there are no megadoses here. Though most go beyond the RDA's, these are still relatively small dosages and certainly not excessive.

You'll also note that I include a number of "antioxidants" in the MVM™ formula. It includes vitamins and minerals like vitamins E and C, selenium and beta-carotene. These antioxidants have been the focus of a number of studies over the last decade, and there's strong evidence that they can contribute mightily to overall health and longevity. In addition, and especially important to the most ambitious dieter, is the role antioxidants can play in reducing fatigue and the breakdown of muscle tissue.

Oxidative Damage And Antioxidants

The enemy and the focus of antioxidant use are substances in the body known as "free radicals." Free radicals consist of highly reactive molecules that possess unpaired electrons. These radicals play a sizable role in the normal metabolism of food and the use of energy resources during exercise.

It's also strongly suspected that they react with the components of body cells in a way that leads to molecular damage and the death of vital cells and, eventually, to aging and death itself. Chemical reactions involving free radicals in the body have been implicated in causing or contributing to cancer, atherosclerosis (hardening of the arteries), hypertension, Alzheimer's disease, immune deficiency, arthritis, diabetes, Parkinson's disease and various other diseases linked with the aging process. Studies, to this date, strongly show that antioxidants can protect the body from the high free radical concentrations that may lead to these diseases.[229]

In fact, data from recent studies have strongly supported the role antioxidants play as protective agents in the genesis of cancer,[230,231,232] heart disease,[233,234,235] and limiting the effects of aging.[236] Administration of antioxidants like vitamins C, E and A has also been found useful for preventing post-surgery complications in hospital patients.[237]

As well, antioxidants have been linked with improved function in transplanted organs,[238,239] and been shown to be helpful in the prevention of cataracts.[240,241,242] Low levels of antioxidants in the body have been identified as a possible risk factor in rheumatoid arthritis[243] and myocardial infarction.[244]

There is also a growing amount of data showing that heavy exercise can adversely affect muscle tissue by increasing the formation of free radicals. These free radicals can then lead to muscle fatigue, inflammation and muscular damage.[245] It's also been found that exercise can decrease the supply of antioxidants. Vitamin E, for instance, can be severely decreased with training thus depleting the muscle of its most important antioxidant.[246]

This is not to say that exercise is bad for you. Quite the contrary. Its benefits, especially for someone looking to build a fit and healthy body, far outweigh any possible drawbacks. It's also a strong factor in increasing longevity[247] and even works to reduce the harmful mental and emotional stress that may build up in an individual during the day.

Still, stress of any kind can become a health issue. No matter what, mental, emotional or physical (as caused by exercise) stress will increase the amount of free radicals produced in the body. During normal conditions, free radicals are generated at a low rate and neutralized by antioxidant enzymes in the liver, skeletal muscle and other systems. But under stress they're greatly increased and can overwhelm the body's ability to neutralize them. Unchecked, they can cause advanced aging and breakdown of the body.

Though some recent studies have brought the overall role of antioxidants into some question, the preponderance of evidence still shows that antioxidants can help undo much of the dirty work done by free radicals. They're not just for the granola crunchers. If you're involved with the Metabolic Diet, especially if you're exercising like you should, you must make a place for antioxidants in your diet.

Increased Antioxidant Use

Several studies that have shown that bolstering antioxidant defenses may ameliorate exercise-induced damage.[248] For example, a 1998 study looked at the effects of resistance exercise on free radical production.[249] The purposes of this study were to see whether free radical production changed with high intensity resistance exercise and, secondly, to see whether vitamin E supplementation would have any effect on free radical formation or variables associated with muscle membrane disruption. Twelve recreationally weight-trained males were divided into two groups. The supplement group received 1200 IUs of vitamin E once a day (400IU thrice daily) for a period of 2 weeks. The placebo group (P) received cellulose-based placebo pills once a day for the same period of time. The results of this study indicated that high intensity resistance exercise increases free radical production and that vitamin E supplementation may decrease muscle membrane disruption.

With the above in mind it's clear that, when used correctly, antioxidants can give you an added edge in both longevity and creating a healthy, fit and attractive body. They will be especially important to those of you who will embark on an advanced, more demanding exercise program. As such, you may want to go beyond the minimum amounts provided by the multivitamin to maximize the advantages antioxidants can bring. If so, I'd suggest you try Antiox™ since I formulated it to be a cutting-edge and extremely potent antioxidant formula.

While antioxidants can be used daily, they should definitely be used on days that you work out. On these days they can be used in addition to your daily multi-vitamin. For those who want a potent antioxidant formula, Antiox™ will fit the bill. To augment this potent antioxidant stack I also recommend that people eat a lot of vegetables (especially broccoli, cabbage, lettuce and leafy greens) and even drink a glass of red wine with their evening meal. With this combo I feel that anyone can cover their antioxidant needs and minimize their changes of developing both short term and long term problems secondary to free oxidant cellular damage.

Antioxidant Players

Because it’s outside the scope of this book to cover the antioxidants in detail, I’ll just briefly cover some of the vitamins, minerals and other compounds that have potent antioxidant properties.

Along with an ability to protect muscle tissue, vitamin E also seems to be of use in limiting arterial damage caused by aging and minimizing any adverse effects of harmful fats on the body.[250] Vitamin C provides direct protection from free radical damage and also has a vitamin E-sparing ability that aids in enhancing vitamin E effects.[251] They work together synergistically in controlling muscle breakdown.

Carotenes come naturally from plants like carrots, cantaloupes, sweet potatoes and other green and yellow vegetables. Many of the carotenes are also called "provitamin A" because the body converts them into vitamin A. Beyond this, there is evidence that carotenes can also strengthen the immune system and protect against body tissue damage.[252]

By far the most well known carotenoid is beta-carotene. What makes it especially compelling is its importance in the oxidation of low-density lipoproteins (LDL)[253], which makes it especially attractive for use with the Metabolic Diet. It seems, however, that beta-carotene on it’s own can be counterproductive, reinforcing my feelings that antioxidants, or for that matter any vitamin or mineral, should not be used in large doses on their own. Selenium plays a role in converting fats and protein into energy and provides antioxidant protection when taken with vitamin E. You'll note that vitamin E is not only an important force in its own right but is also important in enhancing the effects of other antioxidants.

Other Important Vitamins and Minerals:

Folic Acid

Folic acid has been in the news the past several months and for good reason. This B vitamin has been shown to prevent birth defects and may also help prevent heart disease in adults. A few years ago the FDA marked folic acid as an essential nutrient that may be lacking in our diets. Folic acid was included in the growing list of vitamins and minerals being added to the nation's basic food supply.

Originally, the evidence that it prevented devastating neural tube birth defects, which afflict as many as one in 1,000 newborns, prompted the order. The catch is that although most women start taking some vitamins and minerals, including folic acid, once they discover that they're pregnant, the need for folic acid is most critical in the first month after conception. As such, it's important for all women in the reproductive age group to have supplemental folic acid at all times. Ergo the minimal amounts of folic acid now added to some foods.

But as usual there's more to the story. It's possible that folic acid supplementation may also reduce the rate of heart disease among older Americans. That's because folic acid reduces blood levels of a potentially harmful amino acid called homocysteine.

Homocysteine has been shown to be harmful to blood vessels, resulting in increases in atherosclerosis and heart attack or stroke.[254] High levels of homocysteine are linked to an increased risk of heart disease. Folic acid reduces the level of homocysteine in the blood by transforming some of the homocysteine to methionine.

Prior studies have shown that folic acid may be useful as part of the overall treatment of patients who have suffered heart attacks.[255] However, it is now felt that a deficiency of folic acid could trigger some of the heart attacks and strokes suffered by American men each year.

Nonetheless, both men and women need folic acid. Therefore, because the addition of folic acid in foods and in many vitamin formulations is suboptimal, I usually advise all adults to take folic acid supplements, usually 1 mg per day regardless of sex or age.

Calcium

Calcium can prevent muscle cramping when exercising. As well, evidence indicates that it may well delay the onset of fatigue in muscle,[256] and it's suspected that calcium may also increase growth hormone secretion during exercise. If needed, take 500-1,000 milligrams of calcium prior to working out and 500 - 1,000mg during the workout. Calcium can be taken in the form of Rolaids and is especially useful in this format for those who may have use for an antacid as well.

Chromium

Chromium has been shown to be essential to carbohydrate and fat metabolism. Since the need for chromium increases with exercise,[257] and modern refined diets provide little chromium, supplementation may be required. Insufficient dietary chromium has been linked with diabetes and cardiovascular disease.[258] If you're really going at your exercise program, it may become a concern.[259] That's one of the reasons I included it in the multi-vitamin supplement suggested earlier in the chapter. I usually recommend a minimum of 25 micrograms up to 100 micrograms of trivalent chromium per day.

Zinc

Zinc deficiency in humans is widespread[260] and athletes may be particularly prone to lower plasma zinc levels.[261] Zinc is a constituent of more than a hundred fundamentally important enzymes, so zinc deficiency has many negative effects on almost every body function. As well, zinc deficiency can adversely effect the reproductive hormones and as such impair athletic efforts.[263]

Zinc deficiency also adversely affects protein synthesis. One study investigated the effects of zinc deficiency in rats and the levels of free amino acid in urine, plasma and skin extract.[264] The authors concluded that Zinc deficiency adversely affects skin protein synthesis. Especially where a deficiency may be present, supplemental zinc has resulted in an increased secretion of growth hormone and IGF-I,[265,266] and a raised plasma testosterone and sperm count.[267,268] Zinc is thus critical to any body shaping enterprise because of its deficiency can adversely effect the reproductive hormones and as such seriously impair these efforts.[269]

In a recent, but as yet unpublished study, the use of zinc as part of a nutritional supplement that also includes magnesium, resulted in increased strength and levels of testosterone. The interesting thing about this study is that the increased testosterone levels occurred in a group of competitive NCAA football players who were already strength-trained athletes and participated in a highly intense training program.

Magnesium

In a recent study, magnesium supplementation was shown to increase protein synthesis and strength.[270] In another study the authors felt that insulin sensitivity can be improved by reduction of excessive body weight, regular physical activity and, possibly, by correcting a subclinical magnesium deficiency.[271]

Chapter 10: Antioxidant Players

Potassium

Potassium, an essential dietary mineral, is easily lost in sweat and urine. Potassium deficiency is especially a problem for women who, because of menstrual flow and retention and loss of fluids by the body, may experience pronounced potassium swings. Therefore, many women are borderline potassium deficient. Women engaged in a demanding exercise program may experience a real problem with the combination of menstruation, fluid flow and sweat from training.

The problem can also be severe in men due to large quantities lost in sweat from exercise. A mild deficiency can lead to fatigue and lost performance in the gym.[272] A large deficiency can lead to heart problems. That's one of the reasons why you'll find potassium included as a preventative in a good multi-vitamin supplement. As well, a recent study has shown that potassium deficiency inhibits protein synthesis[273] and thus may sabotage some of the toning and shaping effects we're trying to achieve through the Metabolic Diet.

Potassium is available in various formats at health food stores and drugstores. I usually recommend a starting daily dose of 50-100 mg of elemental potassium up to a maximum of 600 mg per day. While it’s important to take some potassium to ensure that there is no dietary deficiency, it’s just as important not to take too much. Moderation is the key since too much potassium can cause some of the same problems as too little, including irregular heart beat and other heart problems.

Pantothenic Acid

Pantothenic acid (vitamin B-5), although included as part of my recommended daily multiple vitamin and mineral intake, may be just what the doctor ordered for the occasional person who has problems getting into the Metabolic Diet.

Pantothenic acid is required for the metabolism of carbohydrates, proteins, and lipids, including the synthesis and degradation of fatty acids, and the synthesis of sterols and steroid hormones. It is also an important factor for gluconeogenesis.

Rich sources of pantothenic acid include meat, eggs, vegetables and dairy products. Thus for most people the foods they eat on my diet, plus the extra amount they get from the recommended daily vitamin tablet, will provide enough pantothenic acid.

However, a recent article has stated that pantothenic acid may be useful as a weight-reducing agent, and may alleviate some of the side effects of dieting, such as weakness and hunger.[274] As well, pantothenic acid may be especially useful in the Metabolic Diet because of its ability to break down body fat and increase the utilization of this fat for energy.

Other Nutritional Supplements

While the use of vitamins and minerals is fairly straight forward, with most of the commotion centering on dosage, that's not the case with the myriad other nutritional supplements available today.

Nutritional supplements are elusive, evasive and difficult to figure out. The netherworld of nutritional supplements is a place where people fear to tread because they might lose their financial souls. And many of the ones that do are invariably lost to the gods of mumbo jumbo (better than steroids; you can eat all you want of whatever you want and lose weight; gain muscle and look like a Greek God or Goddess).

But there is a light at the end of this dark nutritional tunnel. It's called research. This light can make us see what supplements work and which ones are just making the noise. It's easy to get lost when talking about the science of nutrition. All that talk about adrenergic receptors, uncoupling proteins, uncoupling oxidative phosphorylation, lipolysis, lipogenesis, lipases, testosterone, growth hormone, IGF-1, insulin, thyroid hormone, cortisol etc. For now let's just list what works and when to use it.

Creatine Monohydrate

There are so many studies that have been done on creatine you would think that doing any more would be counterproductive. Not so. More studies are needed so that we can see just exactly how creatine works and discover the situations in which it works best. As well, we need more information on just what other factors can improve the incorporation and use of creatine by the body.

Several studies have shown that creatine enhances muscular performance during high intensity weight training, improved sprint swimming performance.[289] It also appears that longer term intake of creatine is beneficial for training and performance. A study provides evidence that creatine is effective even when used long term and counteracts the misconception that the effects of creatine supplementation decreases with time.[290] In this study the relatively long-term use of creatine resulted in long-term improvements in muscle performance during resistance training.

Although there have been literally hundreds of studies on the effects of creatine on performance most of these studies were done to measure the immediate effects of creatine on power and strength. A study published this year also shows that creatine may decrease neuromuscular fatigue.[291] Another shows that creatine, contrary to what we might expect, seems to be effective in boosting low intensity exercise.[292]

The bottom line is that a large number of studies show that creatine supplementation helps, among others, weight training and swimming performance, increases muscle mass and strength and works in both men and women. What more could you ask from any nutritional supplement?

Coenzyme-Q10

Coenzyme-Q10 is a promising substance that can give you some of the antioxidant effects listed earlier in this chapter and may possess other properties useful in increasing exercise performance.[293] It may also influence cell growth and serve some protective effect for muscular injury.[294] Sixty milligrams of coenzyme-Q10 every day could provide a real bonus in general health and your ability to shape or build your body.

Glycerol

Glycerol is a substance that provides extra benefits if you're on a higher-fat/lower-carb diet like the Metabolic Diet. This is mainly because of its effects on insulin secretion[295] and fat metabolism[296] and its protein sparing properties.[297]

Glycerol, glycerin and glycerine are all the same compound. Glycerin and glycerine are generally found on the label of purified, contaminant free, pharmaceutical preparations (U.S.P.) of glycerol and are suitable for human consumption.

Glycerol is a sweet tasting liquid that's not overly palatable. Technically it's an alcohol (it won't get you intoxicated) and, if undiluted, has 4 calories per gram. Glycerol is a normal substrate for those on the higher-fat/lower-carb diet since it is released and metabolized when body fat is broken down (glycerol plus three fatty acids make up the triglycerides present in body fat).

The glycerol molecule can be metabolized directly or used by the body to make glucose by modifying the glycerol to pyruvate and then combining two of the pyruvate molecules. The gluconeogenic process, however, whether from amino acids or glycerol, requires that a certain amount of energy be expended in order to form the glucose.

Glycerol is useful in the higher-fat/lower-carb diet as an alternate energy substrate for those who initially have some problems adjusting to the diet, especially in cases where hypoglycemic symptoms (low blood sugar) are a problem. Glycerol can also be used in limited amounts at those times (say on Thurs or Fri) when you might run out of steam during training. However, the unlimited use of glycerol by those who have successfully adapted to the Metabolic Diet may be counterproductive since it may be used by the body directly or used to make glucose and thus may bypass the very metabolic shift we're trying so hard to make and maintain.

If you are having difficulty adjusting to the diet, or having some hypoglycemic symptoms, using glycerol along with some allowable food might be beneficial and make the transition smoother. Other compounds that could also be used and mentioned elsewhere are pantothenic acid and the amino acid glutamine. One or more of these compounds are usually all that's needed to take care of some of the hypoglycemic rough spots and in anyone having problems adjusting to the diet.

Glycerol has other beneficial properties. As your muscles work during an exercise session, they have a tendency to dehydrate and lose water. As they lose water, they will fatigue. What glycerol does is keep water around the muscle longer to keep it from fatigue. For example, if fatigue is a problem in your workouts glycerol could help. Since glycerol by itself is not very palatable, you could mix a few ounces in with, say, a buffer drink, or any diet drink, and take it during your training session.

L-Carnitine

L-Carnitine appears to increase the use of free fatty acids and fatty tissue in the body as an energy source. More fat becomes available for energy thus saving protein in the muscle cells. Muscle breakdown may also be reduced. Doses ranging from 100-3,000 milligrams or more a day have been used by athletes prior to training with good effect. However, it seems that at least two grams or more per day is needed for the desired effects. On the other hand, it doesn’t appear as if carnitine is a limiting factor in the transport and utilization of fatty acids. So while the jury is still out on the effectiveness of carnitine, it makes sense to use it especially at times when energy output is increased. If you're on an enhanced exercise program, L-carnitine could deserve a look. Just be sure to look for the name "L-carnitine" on the label. Some manufacturers use another cheaper, less effective form to cut cost.

Replenishment and Buffer Drinks

Intense exercise always causes significant fluid loss and reduction in ATP (the muscle cell energy source), a build up of lactic acid and increase in acidity of the body tissues.[298] Although the body can normally handle the extra acidity, the build up comes too fast for the body to cope under the high stress of exercise. With the increasing acidity comes decreased contractibility of the muscle fiber and premature muscle fatigue. This can be a real problem for those pushing themselves during their workout.

There are three ways to approach fatigue and performance drops during exercise, as far as nutritional supplements. One way involves replacing the fluid and electrolytes lost as a result of training. Another involves increasing the energy available for exercise by increasing ATP availability and phosphocreatine levels in muscles. The third way comes from trying to reduce the effect intracellular acid has on the muscle by buffering the build up of lactic acid and hydrogen ions (H+) with certain alkaline compounds.

Ideally, combining all three of these approaches in one formulation that included amino acids such as glutamine, taurine and the branched chain amino acids, glycerine, citric acid, electrolytes, carnosine, and lactate would provide a maximum replenishment and buffering effect. Combined, these ingredients not only replenish fluid and electrolytes (like calcium, magnesium, potassium, sodium and chloride) and provide an ideal buffer state, but also increase ATP availability in muscle and as such effectively fights fatigue. Because of the difficulty in finding an appropriate commercial buffer drink, I formulated Electrosol, the electrolyte solution. Electrosol is made for people who are on the Metabolic Diet as it's low in carbs and high in energy producing compounds.

I've also formulated Power Drink for those who lift weights. Power Drink not only replenishes fluid and electrolytes but also provides over 40 grams of quickly absorbable protein and amino acids per serving to minimize protein breakdown and increase protein synthesis while you exercise. It's the ideal training drink for those who want to maximize muscle mass and performance and minimize body fat.

Caffeine

Caffeine is also of great use in the Metabolic Diet. It has thermogenic, lipolytic, fat-burning properties that result in an increase in free fatty acid concentration in the blood, but only in a diet low in carbs such as the Metabolic Diet. In fact, a high-carb diet seems to negate the effect of caffeine.[299] A good, strong cup of coffee 20 minutes or so before a workout is a nice, natural way to get caffeine and make full use of its benefits. Caffeine is also used as part of a popular thermogenic stack that includes ephedrine. Resolve includes both ephedra and caffeine, as well as more than a dozen other ingredients that maximize the muscle building and fat loss effects of exercise.

Protein

Does exercise increase protein needs? Athletes have been claiming this for years while eating protein-rich foods and adding protein supplements to their daily routine. Most medical and scientific sources in the past have tried to discredit this view. They claim that high-protein diets are unnecessary and that the RDA for protein supplies more than enough for everybody, even the athlete.

However, in recent years, studies involving both strength and endurance in athletes have found that exercise actually does increase protein needs.[275,276,277] While those RDA levels may be acceptable for couch potato types, they won't cut it for the athlete. The intense muscular stimulation of weightlifting seems especially likely to increase both protein catabolism and its use as an energy source. A high-protein diet protects the protein to be used in toning and shaping the body by, among other things, providing another energy source for use during exercise. The body will burn this protein instead of the protein inside the muscle cells.

One animal study found that dietary protein directly stimulated muscle development by limiting protein breakdown and increasing anabolic compounds.[278] Similar effects have been found in humans. It's also been shown that protein drinks taken after weight training may increase insulin and growth hormone and thus have an effect on body development.[279] It also stands to reason that when intensity of effort is high and the body is stimulated to adapt by increasing muscle, protein is going to have to increase to provide for the increased lean muscle mass.

My belief is that once you've exercised past a certain level of intensity, dietary protein becomes important. If you're really working hard, you'll need the extra protein to get the added effect on muscle you're looking for. If you're not working at that kind of level, you probably won't need that protein.

And what's the easiest source of dietary protein for those who need it? Eggs, meat and dairy products; those foods that the higher-fat/low-carb diets have you eating. In this way, the higher-fat/low-carb diet works doubly well in giving the most ambitious dieter what he or she needs for advanced body shaping.

Although there has been some concern about the effects of a high dietary protein intake on the kidney, there seems to be no basis for these concerns as far as the amount of protein involved in the Metabolic Diet (up to 1 gram of protein daily per pound of bodyweight).[280] In fact, some animal studies have pointed to a beneficial effect of high-protein diets on kidney function.[281] Nor do any of the studies demonstrate that a high-protein intake compromises healthy kidneys.

Chapter 10: Protein Foods

Protein Foods vs. Protein And Amino Acid Supplements

Sources of dietary protein range from whole foods, especially eggs, meat, fish, soy and dairy products. Whole protein supplements are usually inexpensive and contain one or more of soybean, milk and egg protein, hydrolyzed protein with variable amounts of di-, tri- and polypeptides, and amino acid mixtures.

The consensus is that there are no valid scientific or medical studies to show that supplements of intact protein have an anabolic advantage over high quality protein foods. The advantages usually cited for the use of whole protein supplements include:

1. Convenience of preparation, storage, and long shelf life.

2. Replacement of dietary protein for those wishing to decrease dietary fat.

3. Ability to raise protein intake by those who wish to minimize caloric intake.

4. Increasing dietary protein by those who cannot eat the volume of food necessary to insure adequate or increased protein intake.

5. In some cases, the cost of protein supplements is lower than corresponding high-protein foods.

While these are valid points, protein supplements have other distinct advantages over whole food protein in hypocaloric, isocaloric and hypercaloric diets. Many studies have shown that milk and soy proteins have ergogenic effects.[282,283] The results from these studies indicate that supplemental proteins significantly improve the physiological condition, lead to better sports performance, and result in significant increases of lean body mass and strength. As well, they showed that athletes who used dietary proteins supplements resulted in a superior gain in muscle as compared to those who simply took in the equivalent amount of calories. Additionally, protein supplements with other ingredients, such as creatine monohydrate, taurine and L-glutamine, often enhance gains in lean body mass.

The meal replacement products (MRPs), whether for weight loss or for weight gain, give you the standard macro and micronutrients at different calorie levels. They may be convenient and either more or less costly than whole foods you can get at your supermarket. However, as an all-in-one package, they are usually more convenient and provide better nutrition than many of us get with junk food meals and calorie-full but nutrient-deficient snacks. Nevertheless, if you're conscientious about what you buy and eat and are willing to put in the time and energy, you can do as well or better by just buying the whole foods and planning your own diet for weight gain or weight loss.

However, some of the newer complete nutrient supplements, such as the MD+ MRP LoCarb, definitely have an edge over even the most meticulously prepared diets. In order to get pharmacological levels of some of the nutrients present in these products, you would have to consume an unrealistic amount of certain foods resulting in a much larger than desired calorie intake and increase in body fat.

The best protein supplements, such as our Myosin Protein Complex™, are specific combinations of various high quality proteins. Taking a combination of supplemental proteins not only increases dietary protein, which should be even higher when trying to lose body weight and fat than at any other time, but will also give your metabolism, thyroid hormone and metabolic rate a boost.

As mentioned previously, it's important to make sure you take in at least 1gram of protein per pound of body weight every day. It's best to spread the intake out in not more than three-hour intervals while you are awake. Take some before bed and as soon as you get up to decrease the catabolic effects of the eight or so hour fast that you go through while sleeping. If you wake up during the night, that's a good time to take some more protein and decrease even further the muscle catabolism. So, for certain effects and results, the engineered cutting edge food supplements are better than whole food protein sources and can be safely and effectively used to increase dietary protein intake and as meal replacements for up to two meals a day.

Amino Acids

Amino acids are the building blocks on which proteins are made and muscle developed. They've come to be major players in the supplement industry because of the interest of bodybuilders and strength athletes. Not surprisingly, they've also been the source of wild claims and huge profits by manufacturers. Some people have used amino acid formulas as an alternative to high-protein foods or supplements. Unfortunately, this makes little sense in terms of pocketbook or practicality. A can of tuna gets you just as much nutrition while keeping your checking account balance a lot healthier.

But amino acids can also be used as an energy source and performance enhancer, and can aid directly in muscle growth. One of the main reasons bodybuilders and other athletes first jumped on the amino bandwagon was the belief that they can increase the release of growth hormone. It turns out that these beliefs were well founded. It's been shown that a number of aminos may increase growth hormone secretion.[284] It's also been shown that they may release pancreatic glucagon and insulin, and thus spur development.[285] I recommend the use of amino acids to bodybuilders and other strength athletes I work with. Though most of you will probably bypass them, those of you who have more advanced goals that go beyond bodyshaping to traditional bodybuilding may want to consider amino acids. With this in mind, I'll give you a brief overview of the field.

Chapter 10: Amino Acids

On first glance, it's important to note that the kind and quantity of amino acids, and their chemical structure, have a great effect on how much of them will get used by the body. Normally, most of the amino acids entering the liver from the body's digestive tract are rendered useless because they're catabolized to urea except for the branched chain amino acids (BCAAs), so-called because they structurally branch off another chain of atoms instead of forming a line. A lesser amount is released into the general circulation as free amino acids.

There is a way around this, though. By flooding the body with a large amount of the right kind of amino acids you can create a "spillover" effect in the liver. With the liver unable to handle them, they're absorbed into the bloodstream quickly where they can aid in muscle growth.

This effect can be used with a "full spectrum" formula that makes use of all 12 of the essential amino acids in the form of small peptides including dipeptide and tripeptide aminos (aminos that are structurally linked together in chains of 2 or 3 links). Full spectrum aminos are absorbed quicker when they're in small chains as opposed to "free form" amino acids composed of longer chains.

This is critical as you need to get the amino acids out of the stomach and into the bloodstream immediately after a workout. A window of opportunity lasts for up to 2 hours, although it’s strongest in the first hour, right after a workout where your muscles crave aminos. The body's busy rounding up all the nutrients and protein "building blocks" it can find to repair and increase muscle size to adapt to the stress of the workout just completed and prepare for the next one.

To properly make the aminos available you've got to have a way to get them into circulation fast and keep them there. That's why the small peptide full spectrum aminos are so necessary if you're taking your exercise or training program to the edge in search of muscle development.

Along with looking for small peptide, full-spectrum amino formulas, you should also keep an eye out for BCAA’s. Several studies have singled them out for their ability to stimulate protein synthesis and inhibit its breakdown thus stimulating muscle growth.

As you may be able to tell, the amino acid field can be a puzzling and complex one. That's why many manufacturers have made big profits while providing inferior products. While you'll find a whole array of formulas on the shelf at any nearby nutrition center, some will work and some won't.

Bottom line, the amino formulas should increase muscle mass by escalating the synthesis of protein and decreasing its loss or use as an energy source. Increasing the available amino acid pool and high-energy phosphates does this and provides an alternative form of energy so protein isn't broken down as exercise continues.

Amino acid supplements aren't for everyone. Most of you will get the kind of fat loss, fitness level and body shape you desire by staying on the Metabolic Diet and a moderate program of exercise. But for those of you out to push the edge of the envelope in pursuit of a truly superior physique, amino acids can be a strong ally.

Oral Amino Acids Can Do You Good

According to one preliminary study, a large oral dose of an amino acid mixture appears to alter the hormonal balance of moderately conditioned athletes. This alteration resulted in elevations of the anabolic hormones testosterone, GH and the anti-inflammatory hormone cortisol. Although further studies should be performed to validate these results, it's obvious from this study and dozens of others done in the past few decades that nutritional supplements can act in a pharmacological manner and, if used selectively, can influence the anabolic effects of exercise.

The MD+ Nutritional Supplement line contains several amino acid containing products that were engineered to help you increase sports performance and to maximize muscle mass and minimize body fat. In particular, MD+ Amino is formulated to provide rapid blood level elevations of potent amino acids when you most need them - For example, immediately after working out.

Glutamine

Individual or selectively combined amino acids may also serve as performance supplements. An example is the amino acid glutamine. Glutamine is the most abundant amino acid in the body and makes up over 50 percent of the intracellular and extracellular amino acids. It plays a major role in liver function, serves as cellular fuel to muscle and other tissue in the body and may regulate protein synthesis.[286] It also precedes the synthesis of amino acids, proteins, nucleotides and many other biologically critical molecules. As well, it bolsters the immune system against the drop in immune function seen as a result of intense exercise.

Most important to the serious athlete and fitness enthusiast is increasing the production of protein (for muscle building) and decreasing protein degradation (resulting in muscle breakdown), are both dependent on the size of the glutamine pool in a muscle cell. If it's high, other amino acids won't be forced into glutamine production and they'll be available for protein synthesis. Skeletal muscle, that might also be used to replace glutamine, is also spared. Glutamine also acts to maintain amino acid balance in the body thus enabling the body to synthesize more protein and possibly decrease symptoms of overtraining.

The mucosal cells of the intestinal tract also use glutamine.[287] In fact, the intestinal tract uses up much of both dietary glutamine and the glutamine released from muscle tissue. As a result, very little oral glutamine gets past the stomach unless large amounts (two grams or more) are used at one time.

Nevertheless, when used in high doses, glutamine is an excellent anabolic driver. Although, I often recommend that five grams or more of glutamine be used before and after exercising, you can do with less. In fact, a recent study found that even a few grams of glutamine taken orally increases plasma growth hormone levels.[288]

Stay Away From These

When you're in the gym you might find people discussing a number of different nutritional supplements and other compounds. Many of these compounds have little effects on weight and fat loss and on lean body mass while some may be useful only under certain conditions.

For example, you've likely heard of the substances bee pollen and royal jelly (the substance produced by bees as food for the queen bee). Though they may ultimately present some medicinal benefits, research has failed to support any link with the kind of weight and fat loss, and fitness goals we have with the Metabolic Diet.[300]

Medium chain triglycerides (MCTs) also get a big thumb down for use with the Metabolic Diet. Very few foods actually contain MCTs, but you'll find some popular MCT supplements out there, mostly derived from coconut oil. Many people in a higher-fat regimen are bullish on these products. They say, "It's fat, why can't we use it?" The fact is that MCTs bypass the whole energy pathway we're trying to establish with the Metabolic Diet and can be very counterproductive.

Not that MCTs can't be helpful. They can be of great use on a diet high in complex carbs because of their protein sparing effects. But on the Metabolic Diet, the body ends up using the MCTs for energy instead of the long chain fatty acids that make up most body fat. As such, we end up bypassing the very metabolic goals the Metabolic Diet is set up to achieve: to burn its own fat and use those triglycerides as a primary energy source.

The long chain triglycerides utilized in the Metabolic Diet also have several advantages over the MCTs. They have an even greater protein-sparing effect than the MCTs.[301] And along with decreasing the formation of body fat, they increase the amount of existing body fat broken down[302] and greatly decrease body fat levels.[303]

Don't be tempted to run down to the health food store and buy some MCTs figuring it's the kind of "good fat" you should use on this diet. They'll actually work against the diet in terms of fat breakdown and body shaping.

Some of you go-getters who want to train on the edge may have read or heard about anabolic steroids somewhere and may be tempted to try them. These drugs, illegally used by athletes to add strength and increase performance, assumed their place as a "wonder drug" earlier in the century, but have now been banned by most organizations for use in competition.

While possessing a remarkable effect on muscle growth and strength, they sport a variety of side effects ranging from psychological dysfunction to heart disease, liver cancer, kidney disease and sterility. Much of my work with athletes has been in the area of finding natural alternatives to these substances. I don't recommend them for your use here.

Similarly, with those anabolic steroid substitutes derived from plants and herbs advertised as substitutes for anabolic steroids. Companies claim that these products contain natural testosterone or have the ability to increase natural testosterone production and thus serve as a substitute for steroids. The fact is that no plant or herb, with the possible exception of truffles (which contain androst-16-en-3-ol), contains any substance the body can transform into useful hormones. The steroids contained in these products are plant sterols, not the anabolic type humans can use.

Similarly, the new crop of prohormones, including androstenedione (the one used by Mark McGwire) have not been shown to effectively increase testosterone. These compounds don't work and can cause significant side effects. Next to the anabolic steroid substitutes, the wildest claims you'll see in the supplement industry may well come from the producers of glandular and herbal fitness products. While some herbal preparations, like those containing ephedrine and caffeine, may well aid the cause of body development, most don't. And, while some are harmless, others can have a toxic effect and should be avoided. Comfrey, for one, has been linked to tumors in the liver and bladder of laboratory rats. Sassafras and pennyroyal may also damage the liver.

As for those glandular extracts, they're universally useless. For instance, the practice of taking testicular tissue from bulls for use in body development is little more than wishful thinking. The body breaks these substances down upon ingestion and they serve little purpose.

Believe it or not, you'll also find some people around a weight room who may hail nicotine as an exercise performance enhancer. Smoking is, of course, the most common and least desirable way to take nicotine. When combined with the over 2000 other chemical substances in a cigarette, nicotine acts as an irritant and cancer-causing agent. Since it can also decrease the lung's ability to clean itself, lung disease can result. Cigarettes also increase risks to cardiac health and early research shows a strong chance of a link to lessened serum testosterone in men.[304] The addictive nature of nicotine is well documented. It's bad stuff.

While less is known about chewing tobacco and snuff, it's just as addictive and can greatly increase the risk of oral cancer and other diseases.[305] As for the nicotine gum and patches developed to help the addicted smoker kick the habit, they have far fewer adverse effects and are, of course, preferable to smoking or other orally taken sources. There may indeed be some kind of up side to nicotine. Both animal and human studies have shown nicotine can reduce caloric intake and aid weight loss. Ceasing smoking may also lead to weight gain.

But there seems little evidence that it possesses any advantage in a gym. You'd be wise to give it up. Even if you're involved with a smokeless tobacco product, given the increased chance of oral cancer and other harmful chemical compounds involved you'd be better to get off the stuff altogether.

There's No Free Lunch

Obviously, some of the supplements above are going to be important to you while others won't. Your overall approach to the Metabolic Diet and your fitness goals will largely determine your supplement choices. If your goals are for a standard level of health and fitness, the only supplements above you may be legitimately interested in are the multi vitamin and antioxidant formulas. If your goals go beyond that to serious bodyshaping or bodybuilding, or if you're in a hurry to reach your goals, the other supplements, especially the supplement formulations listed in Appendix 3, will become more attractive.

Bottom line, it's important to understand that supplements don't get results all by themselves. They serve as a "supplement" or "addition" to your diet and lifestyle. If you're smoking, drinking and not paying attention to your diet or lifestyle, no multi-vitamin or antioxidant formula is going to keep you from running an increased risk of the diseases associated with your bad habits. Likewise, your body is not going to respond with the increased fitness and attractiveness you're looking for if you're constantly living life in the fast lane.

Unfortunately, you'll get little help from the supplement manufacturers on this point. Consistently, you'll find their advertising leaving out the fact that a supplement, no matter how marvelous, can't do it alone.

Chromium picolinate, for instance, is big on the market right now. If you check late night or Sunday morning television these days you're likely to see some infomercials touting its effectiveness in some "scientifically designed" formula just devised. What they don't tell you is that unless you've got the proper nutritional and exercise strategy dialed in, you're not going to get much benefit from it.

Always anticipate that advertisers will make the assumption that you're already Jackie Joyner-Kersee or Arnold Schwarzenegger. They're going to treat you like you've already got all aspects of a winning lifestyle, exercise program and diet in order. But always remember one important principle: There is no free lunch. Nor are there any wonder supplements. So if you want them to work, and that includes even the complex supplement formulations meant to support those people who are on the Metabolic Diet, you're going to have to do some work. If someone could come up with a supplement that absolutely insured longevity and a firm, attractive, healthy body they would no doubt become rich beyond measure very quickly. But this isn't going to happen. You've got to work to take advantage of a supplement. Likewise, the more work you do the more a supplement will help you.

In summary, with the proper diet and lifestyle, wisely chosen supplements can ultimately give you the edge in achieving the body you want and the level of fitness and health you're looking for. Also, the use of certain nutritional supplements can affect the adaptive response and complement the effects of the Metabolic Diet.

The use of these substances in a cyclical fashion also increases long term weight and fat loss. For example, Cellusol 1-2-3™ weight and fat loss solution comes with three different components. Each product is totally different than the others and each is meant to be used for two weeks in a six-week cycle of supplements. The third cycle being a normalizing cycle and along with the Metabolic Diet allows the body, including all hormone levels to return to normal, readying the body for further weight and fat loss.

The Metabolic Diet Nutritional Supplement Formulations

Most people who go on the Metabolic Diet will do quite well by sticking to the diet and using some basic supplements. Some, however, will need more help to lose weight and fat and maintain lean body mass. It's for these people and those that are in more of a hurry to reach their goals, that I've formulated a line of supplements that can give them that extra push and thus help them get the body they want.

The MD+ Nutrition supplements are formulated to provide a comprehensive and complex array of natural substances that are targeted for certain results such as weight and fat loss, meal replacements, snacks, and to enhance the anabolic and fat burning effects of exercise. For a full description of the individual MD+ Nutrition supplements, refer to Appendix 3.

Chapter 11

Having It Your Way

Chapter 11: Special Twists for the Experienced Dieter

Having It Your Way

Special Twists for the Experienced Dieter

Too often people think the solution to a problem has to be complex. They measure the worth of a program by how difficult it is to follow. The bigger and more difficult to carry out, the better. If they're counting every calorie like it's their last, memorizing point value charts and poring over recipe books they figure they've really got something.

They think the only good diet is an impossible diet. Simplicity and practicality are to be avoided at all cost. They plan for failure. When it comes, they can actually be satisfied. Many people look at the Metabolic Diet, see it doesn't contain endless charts and a 50-page recipe section and figure it's just too easy to be on the level. Well, they're wrong. The true measure of a diet is whether it works, and the Metabolic Diet will work when given the chance.

Sure, it's simple. After all, it's basically the diet mankind grew up on before the 20th century carbohydrate revolt that made the food packaging industry rich. There are some new wrinkles based on what science has recently taught us about how to best insure health and fitness. But all we've done is fine-tune the diet we were made to live on and bring it up to the highest nutritional and performance standards.

Though the scientific principles behind its success may be a bit involved, the diet itself is quite easy to carry out. Bottom line, there's not a whole lot to it. Once you've figured out the lowest level of carbs that works best for you, you're well on your way. That will establish your higher-fat weekday/higher-carb weekend guidelines and, after that, it's basically business as usual.

And, as if the diet wasn't simple enough, there's also flexibility built into it. It's made to order for the individual. We know that each person is different, both physically and psychologically. You can't give everyone the same exact diet and expect them to all respond in the same manner like machines.

That's why we urge you to experiment with the diet. I've given you the basic principles. It's up to you to mold and shape the fine points to your own unique body, mind and goals. If used properly, you'll find the Metabolic Diet getting you into better shape than any diet you've ever tried before.

In fact, any part of this diet can be modified to fit the needs of the individual as long as you stay in the fat burning mode. What I suggest is that you stick to the diet as described earlier for the first two months so don't make any big changes. You'll need that long to learn about the diet and how your body responds to it. You may adjust the calories you're eating for best results, but you should stick to the basics for 60 days.

At that point you'll have gone through the "metabolic shift" to a fat-burning mode and become comfortable with the diet. You can then begin tinkering with different aspects of the diet to see how your body responds. It's important to remember that there are few absolutes here. Each person's path to success will be unique. There will be twists that you will use that another cannot. Similarly, you may find the approach of another unsuitable for your body chemistry.

Meanwhile, you'll find yourself having fun. As you progress and accurately track your progress through monitoring body fat percentages, weight, appearance, calories and fat/protein/carb ratios you'll be able to refine the diet to best achieve your individual goals.

In this chapter, I've provided a few of the special modifications to the diet others have found successful. It's important to say that you need not use any of them. Some of you will find it best to take a rigid approach to the diet based on the methods we discussed earlier. Others will find special twists of their own, but I'll give you some idea of the alternatives available as you master the fundamentals of the diet.

Experimenting With Foods

Basically, the Metabolic Diet" 5-day fat/2-day carb" week is a lot like getting in shape or physically peaking for a big event where you need to look your best. After your weekend carb load, on Tuesday or Wednesday, you'll find that you look great. Your body will be at its firmest and most attractively defined. Experiment with the foods you eat on the weekends to see what gets you looking your best. Each week you should see improvement either in weight lost, or in firming up - losing body fat but perhaps gaining some muscle. Judge your progress by the way you look in the early part of the week.

Experiment with high and low-sugar foods (refer to the glycemic index in Appendix 2) and overall fat intake. Then take a good look at yourself on Tuesday or Wednesday. If you look good, maybe at least a bit better than you did last week, then you'll know you're on the right track. If you don't then maybe it's time to make some changes.

That's the beauty of this diet. With the Metabolic Diet you'll have a chance to manipulate your diet every week in terms of your daily carb levels, length of the carb load and the foods you eat to see what works. Each week becomes an experiment. You end up becoming an expert in what to do to make steady progress and ultimately get yourself to where you want to be. Another aspect of this weekly preparation and fine-tuning is that you can optimize your own body at any time. By timing your peak you can look your best for a special event. Be it a summer swimming event, the boss's party or a romantic weekend, you'll be able to basically "train" yourself for maximum attractiveness. You'll also get a surge in confidence knowing you can get your body in its best shape as needed through a proven, sure-fire regimen.

Chapter 11: Experimenting With Foods

How to Look Your Best

On the Metabolic Diet you'll find that there's a day during the week when you'll look and likely feel your very best. As mentioned above, that day will be Tuesday or Wednesday for most people. Others, however, may find themselves looking their best on Monday or even Thursday. It all depends on the way your body reacts to the diet and how you manipulate foods and the length of your carb load on the weekend.

Nevertheless, there will be one day a week when you look your best. You'll feel great, too. All the water you gained during your carb load will be drained out and you'll have just the right balance between glycogen and water in your muscle tissue to look your best. Keep an eye on your body, as you become more experienced with the diet to see when that time comes and take big note of it.

You'll be able to use this information to your advantage when that big event comes around. Suppose you look your best on Wednesday but get invited to the boss's annual Fourth of July picnic that is to occur on a Saturday. Your goal will be to make your body view that Saturday as a Wednesday so you'll look your best.

The way you'll do this is to skip your carb load the weekend before the party and begin it on the following Tuesday. When you complete your carb load on Wednesday, three days will elapse before that big party. When you show up on Saturday you'll be sporting your Wednesday look and be looking and feeling your very best. Being able to pick your best days also comes in handy if you decide to compete in bodybuilding or fitness competitions.

Varying Carb Intake

Besides experimenting with different foods and schedules there are various other ways you can fine-tune the diet so that it fits in with your metabolic abilities. While all of us possess the ability to use fat as our primary fuel, some are more able than others. This is because we all have different genetic capabilities and while some of us have it in them to be efficient fat burners, some of us don’t.

You’ll know, after the first few weeks, if you’re among the few who have difficulty adjusting and using fats as a primary fuel. These people tend to have a tougher time making the switch, can feel tired and are easily exhausted by physical activity. It seems that they just run out of gas shortly after their weekend carbup.

That’s because they’re metabolism prefers carbs to fats and can’t seem to make do on the five day, two day shift. During the weekend they carb load and feel OK for the first few days of the week but when their glycogen reserves are used up they get the ‘hit a wall’ feeling. Just because your body prefers carbs and can’t operate as well on fats doesn’t mean you have to abandon the Metabolic Diet.

It just means you have to change the amount and timing of your carb intake so that the maximum amount of fat is burned along with the necessary carbs. If you can find the minimum carb intake that you need to function normally then you can benefit from the Metabolic Diet.

Now lets say you've done the first two months but still don't feel quite right, even though you've adjusted your carb levels, you're using the right supplements and doing everything right. You're may be tired much of the time, especially Wednesday to Friday and your training may be suffering because you've lost the enthusiasm and stamina you once had. It's time to once again fine-tune your carb intake. You can do this in one of several ways, including the variations we covered earlier in this book.

Increasing Your Weekday Carb Intake

One way is to gradually increase your daily carb intake (by about 10 grams per day) until you reach a level where your symptoms improve. For most people that level will be somewhere between 50 to 100 grams of carbs per day.

It's just as important to time your carb intake as it is to increase the amount of carbs you take in. Besides finding the baseline carb level you also have to find the best time to take these carbs. For people who have to raise their carb levels I find the best time to take the extra carbs is before and after training. For example you might want to take 20 to 30 grams of carbs prior to training, along with the pretraining supplement, and another 20 to 30 grams after training along with your post training meal or meal replacement powder.

On the other hand, you might find that your low point is in the evening after you've worked a long day. In this case a carb spike right after work might be your best bet. Or you just might want to spread out the extra carbs throughout the day. Whatever works best for you keeping in mind that you're looking for the least amount of daily carbs to do the job.

Another important factor here is the kinds of carbs. High glycemic carbs are absorbed very quickly and give rise to a rapid insulin rise. In most cases increasing the lower glycemic carbs by increasing your vegetable intake is the best route to take. For most people doubling or even tripling the carb intake in this way helps them over the low-carb hump, and doesn't seem to affect their weight and fat loss while at the same time they don't experience carb cravings. If these same people take in carbs from other sources, say from dairy products or high glycemic foods, it can stop their weight and fat loss and make them hungry.

For some people, eating higher glycemic carbs may work best prior to and after training. Everybody is different, so it's important to experiment with different foods. But be careful, keep an eye on how you look and the progress you're making. If you're losing ground then it's not for you and you have to rethink what you're doing.

Chapter 11: The Midweek Carb Spike

The Midweek Carb Spike

Some people may find that what they need is a midweek "carb spike". This replenishes their glycogen stores and holds them over until the weekend. You can do the carb spike in several ways.

One way is to dramatically increase your carb intake for that day by either taking it in all at once (like a pancake and syrup feed) or spread it out over the day, using either high and/or low glycemic foods. One popular way is to take in a mini-carb load lasting an hour on Wednesday morning. During the "carb spike" most people concentrate on loading up with high glycemic foods and take in between 200 to 800, sometimes as many as 1000 calories in that hour. Once you've had your mid-week carb feed, you should head right back to low-carb land.

For some people, a mid-week jolt of carbs can be very productive, especially for those interested in advanced body shaping or building. The increased blood sugar and subsequent insulin spike will increase muscle and liver glycogen dramatically, give you an extra energy "kick" and drive amino acids into muscle cell for increased development. As long as you go right back to the Metabolic Diet, you'll avoid putting on unwanted fat.

In all cases where you increase your carb intake during the week it's important that you subsequently curb some of your carb intake over the weekend. That way you won't be overdoing your long-term carb intake. For example you might only want to carb load one day over the weekend or even skip the weekend carb up altogether.

Short-Term Loading On Weekends

On the weekends you're usually pretty free to take in whatever foods you like. In general, you'll be increasing both your calories and carbs without too much worry over what kinds of foods you eat. On the other hand, there are some caveats.

For some, two days of carb loading may be too much, especially if you go overboard and eat everything in sight. One of my male patients used to keep his calorie level at about 2000 calories per day during to weekdays and jump to 10,000 calories per day on the weekend. Needless to say we had to curtail his carb overload on the weekends so he could reach his weight and fat loss goals.

As well, some people can get pretty sensitive to carbs and find that after carb loading for one day they just don't feel right. They bloat out, feel tired, and just don't function very well. In these cases it's best to just carb up for one day or even part of one day and then get back on the higher-fat/low-carb diet.

This will make the diet a six-day low-carb/one-day high-carb experience, but if this works for you then it's the way to go. Again, the length of carb loading depends on the individual. The important thing is to experiment with the length of your weekend carb load and learn what works best for you.

Eating foods very high in glycemic value with less fat will generally lead to a shorter, more intense carb load. You'll almost certainly start to lose tone and retain water sooner, often before the 24-hour mark. By using lower glycemic carbs, or combining foods (such as pasta mixed in with protein and fat), you'll take longer to load. You may want to experiment with both of these approaches to see what works best.

Keep in mind that it’s important to document aspects of the diet and their effects on the body. It may be inconvenient or even painful, but if you're interested in getting the most out of your efforts, you've got to chart your progress and the ways you respond to changes in the diet. Make notes to yourself on when you begin to smooth out during the weekend, what you were eating, how many calories you were eating and any other essential information.

Keeping your own diet log will give you a record of what you've done and give you added confidence with the moves you make in training and diet. This is the way you'll really define the time when you look best and how to get that look. You may back off on the documentation after being on the diet for some time and becoming familiar with it, but you'll still want to make at least weekly notes on your findings as you proceed.

Long-Term Loading On Weekends

Some people will cheat in the other direction on this diet and they'll pay for it. They get to Thursday and then suddenly decide they're going to start their carb load on Friday. They continue it on through Sunday and, guess what? Their body shifts back to a carbohydrate metabolism. Three days is too much. At that point, you're running a real risk of losing the fat burning advantage this diet gives you. Long-term carb loading is not a good idea.

But the higher-fat/low-carb diet is forgiving. If you're at a birthday party in the middle of the week and don't want to be anti-social, you can have that piece of cake. Likewise, business or social conditions may warrant a high-carb meal during the week on occasion. Don't worry about it. As long as you get right back on the higher-fat/lower-carb diet you won't find your body shifting back. After you've been on the diet for awhile it will usually take at least three days of continuous carbs for the metabolism to shift back.

In fact, the longer you're on the Metabolic Diet, the more time it seems to take to go back to a carbohydrate metabolism. For those who have been on the diet for years, it may eventually become as difficult to make the switch back to burning glucose for energy as it was to go through the metabolic shift to become a fat-burner.

Chapter 11: Long-Term Loading On Weekends

The Metabolic Diet suppresses the glycolytic pathway used by the body when carbs are the primary energy source. At the same time, the lipolytic (fat burning) pathway is activated. The longer you're on the diet, the more carbohydrate loading it seems to require to activate the glycolytic pathway fully again. Even if you go out on the road and you're forced to change diets for a week, you can generally return to the diet without going through another metabolic shift if you've become a Metabolic Diet veteran.

The Metabolic Diet may even be accident-proof. One Metabolic Dieter, who'd been on the diet several months, began limiting most of his carbohydrate consumption to a bowl of ice cream at the end of the day. Several months later he suddenly took a close look at the package and found he was eating double the carbs he thought he was. Yet he never spilled back into carb mode. It seems that, through the suppression of the glycolytic enzymes, his body had set a new level of tolerance for carbohydrates.

Not that we suggest you double your carb intake during the weekdays. This is just to say that the Metabolic Diet doesn't make you pay dearly for any mistakes you might make. After shifting over on the diet, it will generally take a minimum of three days of carbs to do serious metabolic damage.

Varying Calories

Many athletes have found that if they do the same workout every day, their body becomes used to it and no longer responds. They don't get stronger; they'll plateau. You may eventually find this to be true in your own exercise program.

It's the same with the Metabolic Diet. If you eat the same exact amount of calories every day, you may eventually start to lose the effect of the diet. That's why you should try to do some varying of calories on a day-to-day basis. Stairstep them. If 2000 calories a day is your goal, try taking 3000 calories one day, 1000 the next, 2500 the day after that and so forth. Count your calories on a weekly basis instead of daily. Be unpredictable. Don't let your body get used to the same caloric intake daily. By doing this you keep the body guessing so that it doesn't make some adverse hormonal changes, or drop the BMR to accommodate the drop in calories.

Stairstepping: The 3,000 Calorie Diet	
Day	Daily Calorie Intake
Monday	3,500 Calories
Tuesday	2,000 Calories
Wednesday	3.000 Calories
Thursday	4,000 Calories
Friday	2,500 Calories
Total Calories	15,000 Calories (3,000/day)

You can also vary those calories on the weekend. A good rule of thumb, at the beginning, is to increase calories no more than 25 percent over your weekday allotment but, once experienced with the diet, you're on your own. However, you do have to be careful. If you take in a lot of calories, especially the high glycemic variety, you may find yourself laying down fat very quickly.

Extreme Variance

Some have tried extreme increases in calories during the weekend and experienced success. Those dieters who want to maximize lean body mass and lose body fat rather than lose weight mainly use this method. They get to Saturday and intuitively sense that it’s time to shake their metabolism loose. They'll take in up to 10,000 calories on Saturday, maybe cut it in half on Sunday, and experience a huge insulin spike. They'll get a big effect as far as bodyshaping but, because they go right back on the higher-fat/lower-carb diet on Monday, insulin will be limited before it begins to encourage much laying down of fat.

The dieter may end up gaining up to 10 pounds or so from the extra sugar and water, but the high fat/low-carb diet will find him dropping the water weight quickly as the week progresses. By Friday, he'll have increased weight to a strategic degree but won't have overdone it, and the increase will be maximum muscle and minimum fat.

I only recommend this modification for those who've begun to move into actual bodybuilding where weight and increased muscle mass may be sought. Even then, you wouldn't want to try these huge calorie increases often. Though it's something the advanced Metabolic Dieter may want to experiment with, I'd proceed with caution and work the calories up slowly rather than take a huge jump from weekend to weekend.

Low-Protein Weekends

After being on the diet for awhile, you may want to begin treating the weekends as a high-carb/higher-fat exercise while paying less attention to protein. Some people who have been on the diet for an extended period have found that a weekend diet of around 40-45 percent fat, 50-55 percent carbs and only 7-10 percent protein can produce excellent results.

The added fat aids in slowing the release of glucose in the blood, thus avoiding sugar rushes or crashes that can leave you feeling spent and irritable. By using lower glycemic foods with increased dietary fat, you'll also be able to extend the length of your carb load and not feel the puffiness and bloat that should signal its end. As for the protein, you're getting enough during the week to get through the weekend with no problems.

As well, studies have shown that protein utilization after relative protein restriction rebounds to higher levels than was present prior to the restriction. Studies have also shown that in times of protein depletion, the body likely conserves muscle protein and increases the burning of fat stores for energy. This adaptation is usually lost when body fat stores near exhaustion.[306]

In summary, the weekend protein break won't have any adverse consequences on your attempts to build a more muscular toned body, and may in fact enhance the process of fat loss.

Follow That Instinctive Voice

If you're on a minimal calorie diet, you've got to listen to that instinctive voice in your body and do what it tells you to do. If it says eat, eat. As minimal as your caloric intake may be, you're trying to manage it; not starve yourself.

This is another area where the higher-fat/low-carb diet has an advantage over the competition. On the high-carb diet, if you're in a negative calorie intake situation (where your body requires more calories for weight maintenance than you're putting in), you'll use up the carbs you're eating for energy very quickly. After that, the primary source for energy will be mostly protein and some fat. On the high-carb diet, you can find yourself losing a lot of muscle tone because of the body raiding protein for energy. Not so with the Metabolic Diet, where there's fat available to burn instead of protein. Protein is thus saved and so is muscle.

Remember, too, that fat is satiating. It delays the onset of hunger and you feel fuller after you eat it. You'll also experience fewer cravings when you've made the metabolic shift to being a "fat burner". These characteristics can be most helpful in a situation where you're burning more calories than you're taking in.

Aerobics

My advice is don’t overdo aerobics. Some people spend hours a day on the stairmaster or treadmill. The good news is, this will take off fat. The bad news is that a good deal of muscle goes with it. Only 25-30 minutes of aerobics should give you enough work to burn some fat without compromising muscle.

The Big Event

If you're pointing for a big event, including even a bodybuilding or fitness competition, and getting your body ready using the Metabolic Diet, you should be careful not to do anything silly before the big day. Don't push up your aerobics workout unless you don't mind losing body tone or shape. Don't gorge or starve. Don't panic. Just stay with the program you've developed from watching when and how your body looks best. If you want to increase overall definition, you'll find that sitting in a Jacuzzi or hot tub for 15-20 minutes can pull water out of the body if you're retaining it.

Chapter 12

Why The Metabolic Diet Is Best

Chapter 12: Why the Metabolic Diet Is Best

Why It's Best For You

While the Metabolic Diet is a variable carbohydrate diet, it's not a high-carb diet, except for the very few who are genetically suited to it. In fact we try and have you work out the lowest amounts of dietary carbs that suits your unique metabolism and maximizes lean body mass and fat loss. The bottom line is that most people will take in less carbs than they did prior to going on the diet. Maybe not rock bottom carbs, but less than they may be used to, at least during the low-carb days.

Inevitably, taking in less dietary carbs involves a few restrictions. For some these restrictions might tempt them to take another look at that standard, 'one-diet-for-all', high-carb diet that may be starting to look good again. If it does, let's take just a minute to remind you of the problems you can expect to find if you give up on the Metabolic Diet and go back to your old ways.

Would You Rather Burn Muscle Or Fat?

For most of us being on a low-fat diet just doesn't do it. That's because you don't burn body fat efficiently. Your fat burning capabilities are severely limited by a carb-based metabolism. In order to understand why, it's important to know a bit about body fat and fat cell metabolism.

It makes sense to limit carbohydrates and therefore prevent chronically elevated, or even intermittently elevated, insulin levels. The Metabolic Diet controls insulin and therefore makes it easier to mobilize body fat, which is then preferentially burned for energy.

On high-carb, low-fat diets, since there is little fat in your diet, glucose for energy has to come from your diet or the available protein in your body. There goes your muscle tone and the ability to shape a more attractive body. Instead of a fat-burning machine, you become a muscle-burner and, again, you can end up with a body that looks like it's supported by toothpicks.

Protein can also become a problem and lead to loss of body tone. This won't usually be a problem on the Metabolic Diet where you'll be eating meat and other foods renowned for having plentiful amounts of protein. In lower calorie diets or in those who are training hard, extra protein can be taken in with the use of MD+ Myosin Protein Complex or with the use MD+ MRP LoCarb meal replacement shakes and sports bars, all of which are low in carbohydrates.

Fat is also very dense calorically. It has 2.25 the energy density of carbs or protein. You get 9 calories out of every gram of fat compared to 4 calories for every gram of carbs or protein. That means for every gram of fat, you get 2.25 times the amount of energy. Bottom line, it is a far more efficient energy source.

Hunger

Your body will look on any loss of calories as potential starvation. If you end up cutting calories drastically, especially on a high-carb diet, your body and mind can work against you. You'll be caught in a conflict between mind a body. While your body feels incredibly hungry and pleads with you to eat, your mind will be struggling to keep the diet in place. Because the Metabolic Diet is more satiating and leads to far fewer "hunger pangs" it can make your weight loss experience far easier on mind and body.

Meanwhile, that carb-based diet can really begin playing tricks with your mind. If you're cutting back calories and trying to stay high-carb and low fat, irritability can result. Stress will be added to your life. Relationships may be a little strained as you can become self-absorbed and even invent problems where they didn't exist before. In some cases, a carb-based weight loss regimen and ensuing hormone fluctuations can even blunt your sexuality. Hunger can do strange things to the mind.

Inconvenience

Being on a restrictive high-carb, low-fat diet can be rough if you're dining out or are just being sociable. It's a lot easier to go for the meat and keep the carbs at bay rather than stick to a carb-based diet. Depending on what carb level works best for you, it's easier to eat the meat and cut back on any of the carbs than just to fill up on rabbit food. On the Metabolic Diet, if you're eating out you can just order a steak and know you'll be good. If you want to rejoin the human race, trading that carb-diet for a higher-fat/lower-carb diet could be just what the doctor ordered.

Mood Swings

As mentioned above, endorphins and enkephalins are natural substances in the body that are natural narcotics. No doubt you've experienced the sense of well-being an endorphin rush can bring during exercise. The Big 3 hormones that the Metabolic Diet seeks to use; testosterone, growth hormone and insulin, all work to vary levels of endorphins and enkephalins in the body.

In the carb-based diet, the hormonal swings can be so great (especially due to insulin), that you'll find yourself on an endorphin and enkephalin roller coaster. The ups and down, irritability and mood swings can really be something. You'll find these swings far less dramatic and less frequent as the Metabolic Diet works to manage these substances.[307]

Chapter 12: Why the Metabolic Diet Is Best

A Shapeless Body

People on those high-carb diets, even when successful, often end up disappointed with the finished product. Their bodies lack the shape, definition and tone they thought they'd have when they lost weight.

The Metabolic Diet is designed for you to lose weight, gain a true level of fitness and give you the opportunity to shape a firm, attractive body that you'll be proud of. Along with the fat-burning properties of the diet come toning and shaping qualities that, with a good exercise program, can give you exactly what you've been looking for.

At this point, I would like to congratulate you on making the switch over to the Metabolic Diet and I encourage you to email any questions you may have directly to me at Mauro@MetabolicDiet.com .

My best wishes for your bodyshaping and fitness endeavors,

Mauro Di Pasquale, M.D.

Appendix 1

Height And Weight Table

Appendix 1: Height And Weight Table

Men Aged 25 And Over

	Small Frame	Medium Frame	Large Frame
5'1"	105-113	111-122	119-134
5'2"	108-116	114-126	122-137
5'3"	111-119	117-129	125-141
5'4"	114-122	120-132	128-145
5'5"	117-126	123-136	131-149
5'6"	121-130	127-140	135-154
5'7"	125-134	131-145	140-163
5'8"	129-138	135-149	144-163
5'9"	133-143	139-153	148-167
5'10"	137-147	143-158	152-172
5'11"	141-151	147-163	157-177
6'0"	145-155	151-168	161-182
6'1"	149-160	155-173	168-187
6'2"	153-164	160-178	171-192
6'3"	157-168	165-183	175-197

Women Aged 25 And Over

	Small Frame	Medium Frame	Large Frame
4'9"	90-97	94-106	102-118
4'10"	92-100	97-109	106-121
4'11"	95-103	100-112	108-124
5'0"	98-106	103-116	111-127
5'1"	101-109	106-118	114-130
5'2"	104-112	109-122	117-134
5'3"	107-115	112-126	121-138
5'4"	110-119	116-131	125-142
5'5"	114-123	120-136	129-146
5'6"	118-127	124-139	133-150
5'7"	122-131	128-143	137-154
5'8"	126-136	132-147	141-159
5'9"	130-140	136-151	145-164
5'10"	134-144	140-155	149-169

In this table height is measured in feet and inches, without shoes. Weight is measured in pounds, without clothing. To determine your frame size, try to touch your thumb and index finger around your wrist. If your fingers overlap, you have a small frame. If they just meet, you have a medium frame. If they do not touch, you have a large frame.

Source: Metropolitan Life Insurance Company, *Stat Bull Metropol Life Insur Co*. 1983: 64:2-9.

Appendix 2

The Glycemic Index

Appendix 2: The Glycemic Index

Glycemic Index Of Some Carbohydrates

The glycemic index is defined as the surface under the blood sugar curve after ingesting a particular carbohydrate, during a nominal period of time. It is expressed as a factor in percent of the response for glucose (pure sugar). The higher the GI, the more significant effect this food will have on your blood sugar, and consequently, the more you should avoid it.

Maltose	110
Glucose	100
Baked potatoes	95
Parsnips	95
Very white bread	95
Mashed potatoes	90
Honey	90
Carrots	85
Corn flakes, pop-corn	85
Rice cakes	80
French fries	75
Donuts	75
Refined cereal with sugar	70
Mashed potatoes	70
Chocolate bar, candy bar	70
Boiled potatoes	70
Cookies	70
Corn	70
White rice	70
Half bread (1/2 white 1/2 whole)	65
Pita bread, white	65
Croissant	65
Beet	65
Pizza, cheese	60
Banana	55
Jam	55
White pasta	55
Rice, brown	55
Popcorn	55
Corn	55
Whole grain bread	50
Whole rice	50
Complete cereal (no sugar)	50
Carrots	50
Orange	45
Spaghetti	45
Sweet potato	45
Green peas	45
Oat flakes	40
Fresh fruit juice (no sugar)	40
Whole rye bread	40
Pinto beans	40
Whole pasta	40
Integral bread	35
Dairy	35
Lima beans	35
Chick peas	35
Dry beans	30
Lentils	30
Garbanzo beans	30
Integral pasta	30

Fresh fruit	30
Grapefruit	25
Fruit marmalade (no sugar)	25
Milk, full fat	25
Dark chocolate >60% cocoa)	22
Fructose	20
Soy	15
Peanuts	15
Greens, toms, lemon, mushrooms	15

Appendix 3

The Metabolic Diet Nutritional Supplements

MetabolicDiet.com Books

MD+ LINE OF NUTRITIONAL SUPPLEMENTS

Cellusol 1-2-3 System

The Complete Nutritional Supplement Cellulite and Weight Loss Solution

Cellusol is a multi-phase supplement and by far the most advanced weight and fat loss formula ever. It's light years ahead of anything out there right now including prescription diet aids. Cellusol has more than ten times the active ingredients of any other weight loss product, and instead of using one or two approaches, like most other products, it attacks the problems of weight and fat loss from several directions ensuring both immediate, and more importantly, long-term success.

Cellusol has been formulated to accomplish maximum weight and fat loss, especially cellulite, while at the same time minimizing the loss of muscle. This means that the weight you lose will be mostly bodyfat and you'll look both fit and trim as you lose your weight.

Cellusol is a stacked/cycled product consisting of 3 formulations. Each formulation is meant to attack the problem of maximizing body composition from a different angle.

For the first two weeks you take Thermo. Thermo increases metabolic rate and as such increases energy output, plus it increases the breakdown and burning off of bodyfat, including cellulite, and helpS maintain muscle.

For the next two weeks it's Metabolic, which is meant to help you keep your precious muscle and keep the fat coming off. It also optimizes the important hormones and processes in your body including increasing insulin sensitivity, and regulating growth hormone, testosterone and thyroid levels.

For the next two weeks it's Renew, a sophisticated, cutting edge product meant to enhance the immune systems and support your metabolism—essentially to get the body raring to go and ready for the weight and fat loss actions of Thermo.

Each package of Cellusol contains enough product for two successive cycles—each 6-week cycle will take you to a new level of weight and fat loss. By cycling each formula for a two-week period you won't allow your body to adapt to any one formula and as such your weight and fat loss won't plateau. You'll continue to lose weight and bodyfat in each of the six-week cycles.

Because one of the phases is a renewal phase, during each six-week cycle you'll be allowing your body to regain it's normal balance and become more receptive to the weight and fat loss supplements that are in the other two formulations. You'll no longer have to worry about staying on any supplement for too long and reaching a weight and fat loss plateau because your body gets used to the supplements, or go through a rebound and gain your weight back when you stop taking the weight loss aids.

While **Cellusol** will work it's magic alone, it works best if you follow a complete exercise and nutrition program. Regular exercise and going on the Metabolic Diet will maximize **Cellusol**'s effects on body composition and weight and fat loss and allow you to reach your goals much faster and easier. The end result of using all three will be a fit and toned body that you'll be proud of.

- ➲ Phase One Formulation – Thermo
- ➲ Phase Two Formulation – Metabolic
- ➲ Phase Three Formulation – ReNew

Thermo – Advanced Thermogenic and Anabolic Formula

Thermo is formulated to increase energy levels for training, maximize fat loss by increasing fat oxidation and decreasing fat deposition, while at the same time maintaining muscle mass.

Thermo increases the body's thermogenic response, increases energy for training, has anticatabolic and anabolic properties that maintains muscle mass, increases fat breakdown and fatty acid utilization, decreases appetite, increases insulin sensitivity and supports thyroid hormone activity.

Directions: One to two capsules two to three times a day on a relatively empty stomach (at least an hour before eating or two hours after eating). On training days take before training; or if not working out that day, take two capsules in the morning and two in mid to late afternoon.

Metabolic – Advanced Anabolic and Fat Loss Primer

Metabolic is formulated to optimize the body's hormones in order to maximize the anabolic and fat burning effects of exercise.

Metabolic optimizes the effects of thyroid hormone, decreases cortisone levels and increases levels of growth hormone and testosterone (in both men and women) along with increasing insulin sensitivity. These effects increase weight and fat loss while maintaining or even increasing muscle mass. As well, the hormonal environment created by Metabolic will allow cellulite, that stubborn dimpled fat, to be oxidized along with the rest of the bodyfat.

Metabolic is especially useful for those on lower calorie diets. That's because under low calorie conditions the body responds to protect you from starvation by increasing appetite and decreasing your metabolic rate. Under starvation conditions these responses are protective and help insure survival. Unfortunately for those wanting to lose excess bodyfat, these responses are counter productive and make losing weight harder than it should be. Metabolic counters these responses by decreasing appetite and increasing metabolic rate. As well, it increases the body's fat burning response and decreases muscle breakdown.

Directions: One to two tablets three times a day.

ReNew – Homeostatic and Immune System Enhancer

ReNew is a premier product that, as part of the Cellusol team, enhances and stabilizes weight and fat loss and allows the body to return to an optimal metabolic and immune state where it's once again ready and able to respond to the next two Cellusol cycles. With ReNew you return to a state where the body solidifies previous weight and fat losses and is once again sensitive and responsive to both Thermo and Metabolic. In a sense, ReNew rejuvenates your body so that it is ready and able to make dramatic weight and fat losses.

Directions: Five tablets once or twice a day with meals

LipoFlush – Ephedrine Free Revolutionary Fat Loss Formula

LipoFlush is a research-driven, synergistic blend of natural ingredients designed to dramatically decrease body fat, increase energy levels, preserve skeletal muscle, and provide major health benefits.

While other fat loss supplements work on one or at the most two dimensions of the fat loss equation, LipoFlush attacks fat from several independent and synergistic ways, resulting in unprecedented fat loss.

One of these ways, not available in any other fat loss supplement, will literally flush the fat right out of your body.

Like liposuction, LipoFlush can make some of your fat simply disappear, but unlike liposuction, LipoFlush can do it in the problem areas and also evenly all over your body, leaving you with an aesthetic looking body with just the right look.

But that's not all. LipoFlush is not only useful in getting rid of unwanted fat, it also helps you to keep it off. There are several ingredients in LipoFlush that counteract the rapid increase in weight and body fat that happens when you go off most diets.

LipoFlush Does It All

- **Decreases fat absorption.**
- **Increases body fat breakdown or lipolysis, releasing fat into the circulation.**
- **Decreases fat formation, or lipogenesis (fat creation).**
- **Reverses the effects that cutting back on calories has on the body by normalizing thyroid hormone and metabolic rate, increasing the uncoupling of oxidative phosphorylation, and decreasing hunger.**
- **Suppresses appetite.**

- **Keeps your metabolism going 24 hours a day so that you lose and burn fat even while you sleep.**
- **Keeps energy levels high by correcting any metabolic dysfunction and optimizing energy and macronutrient cycles.**
- **Increases energy output by increasing heat production.**
- **Flushes fat from your body, and decreases the number of fat cells, much like liposuction.**
- **Increases energy and subsequently the burning of fat by optimizing mitochondrial function and increasing TCA cycle flux for maximum fat burning.**
- **Has no significant side nervous system, heart of increased blood pressure side effects.**
- **Preserves or even increases muscle mass. Subsequently enhances fat oxidation to supply the energy needed for protein synthesis and metabolism.**
- **Decreases homocysteine levels in the body and thus decreases the tendency to cardiovascular disease.**
- **Reduces levels of C-reactive protein, a measure of stress and inflammation in the body.**
- **Increases insulin sensitivity and decreases insulin resistance and the associated possibility of developing diabetes.**
- **Increases systemic levels of B12, folic acid and B6 to offset any deficiencies in these vitamins, leading to increased mental and physical energy and feelings of well being.**
- **Decreases cholesterol and triglycerides levels, while at the same time favorably affecting HDL (increasing) and LDL levels (decreasing).**
- **Increases calcium availability. Recent studies have shown that increased calcium, whether in the diet or by way of calcium supplements, results in lower body fat. LipoFlush contains over 400 mg of calcium in every dose.**

LipoFlush represents a quantum leap in fat loss supplements. It's the first supplement that effectively decreases body fat by working at all the relevant metabolic, absorption and excretion levels, while at the same time providing substantial health benefits.

Exersol 1-2-3 System

The Complete Exercise Solution

Resolve Power Drink Amino

Exersol Competition

Resolve Competition Power Drink Amino

Exersol is a three-phase exercise-oriented nutritional support system that takes the guesswork out of what supplements to use before, during and after training. As the most scientifically advanced and sophisticated exercise orientated nutritional support system ever formulated, its use is invaluable for anyone who wants to lose bodyfat and build muscle.

Exersol is the Complete Nutritional Supplement Training Solution and as such, you have the peace of mind that comes with knowing you have everything you could possibly ever need to maximize the anabolic and fat burning effects of exercise. You also have the peace of mind knowing that there is absolutely nothing out there that even comes close to doing what Exersol will do for your training and body composition, regardless of price, reputation and claims.

Exersol has been formulated to allow you to get the most from your training efforts. Not only will it maximize the fat burning and muscle building effects of exercise but it will allow you to train longer, harder and more effectively, and make the training you do much more productive.

- Formula Number One – Either **Resolve** or **Resolve Competition** before training.
- Formula Number Two – **Power Drink** – during training.
- Formula Number Three – **Amino** – after training .

Resolve and Resolve Competition – Advanced Pre-Workout Anabolic and Fat Burning Primers

Resolve and Resolve Competition are the ultimate pre-training formulations. They prime your metabolism so your body can optimize the anabolic and fat burning effects of exercise.

These formulas will provide anticatabolic and anabolic effects by increasing levels of testosterone and growth hormone, decreasing protein breakdown, increasing protein synthesis and providing cell volumizing effects that increase muscle growth. They also maximize ATP and phosphocreatine (PC) functioning, as well as gluconeogenic and other processes, allowing for more strength and stamina. As well, it provides potent thermogenic and fat loss properties, increasing fat breakdown and utilization and decreasing fat buildup. And finally they exert a potent antioxidant effect to decrease muscle tissue injury and soreness.

While almost everyone considers post training nutrition as being important, many fail to realize that the intake of amino acids and other ingredients prior to training is as, or perhaps even more important for maximizing the anabolic and fat burning response to exercise (Tipton KD, Rasmussen BB, Miller SL, Wolf SE, Owens-Stovall SK, Petrini BE, Wolfe RR. Timing of amino

acid-carbohydrate ingestion alters anabolic response of muscle to resistance exercise. Am J Physiol Endocrinol Metab 2001 Aug; 281(2):E197-206.).

Resolve and Resolve Competition, by increasing lipolysis, and thus the availability of fatty acids, complement the Metabolic Diet, which increases fat oxidation. The combination of increased bodyfat breakdown and increased burning of fat for energy make Resolve and Resolve Competition ideal pre-workout primers for those on the Metabolic Diet. As well, Resolve and Resolve Competition contain no carbohydrates.

Resolve – with ephedrine and yohimbine

- Maximizes muscle growth and strength and minimizes bodyfat.
- Optimizes the anabolic and fat burning effects of exercise.
- Decreases muscle breakdown and increases protein synthesis.

Resolve Competition – with no ephedrine or yohimbine, but with neurotransmitter precursors

- Maximizes the muscle building and fat burning effects of exercise.
- Optimizes your metabolism.
- Supplies increased energy for training even though it's stimulant and ephedrine free.

Power Drink – Advanced Anabolic Training Drink

Power Drink is a revolutionary new concept in training drinks. There's nothing even close to it on the market. This drink provides the nutrients necessary to maximize muscle mass by increasing the anabolic and decreasing the catabolic effects of exercise, and increasing the mobilization and oxidation of bodyfat.

Power Drink contains over 30 grams of whey protein isolate (a "fast" protein that results in high systemic amino acid levels), which is over 25% branched chain amino acids. As well, the formula contains several amino acids (arginine, alanine, taurine), glutamine peptides, creatine, ribose, electrolytes and other ingredients that will replace and replenish nutrients and fluid lost through exercise, prevent muscle cramps, and increase training time and efficiency.

The formula contains no carbohydrates or fat except for glycerol (which does not raise either glucose or insulin levels appreciably, and ribose, which increases the reformation of ATP and other important cellular compounds).

- Maximizes training energy and efficiency.
- Increases training effort and effects.
- Maximizes muscle mass and increases fat oxidation.

Amino – Complete Amino Acid Formula

Amino, the cutting-edge amino acid formulation, maximizes protein synthesis by providing you with a quick and potent boost of anabolic and anticatabolic amino acids. The high systemic levels of important amino acids provided by Amino has a direct potent effect on protein synthesis, and at the same time increases systemic levels of the potent anabolic hormones, including insulin, testosterone and growth hormone.

Used immediately after training it's an easy to take, easy on the stomach, source of amino acids that kicks protein synthesis into high gear so you can begin taking advantage of that post-training window of opportunity. Amino is formulated to provide a square wave increase in the availability of blood amino acids within minutes after ingestion, and a measurable increase in muscle protein synthesis within less than half an hour—much faster than other post exercise supplements.

Amino is an enhanced, cutting-edge amino acid formula consisting of free amino acids, a hefty dose of special glutamine and other peptides, and several special ingredients. The amino acid, peptide blend, and special ingredients in Amino work together synergistically to immediately increase blood amino acid levels, insulin sensitivity and insulin levels, as well as growth hormone and testosterone levels, resulting in increased muscle protein synthesis which maximizes the anabolic and fat burning effects of exercise and combats overtraining.

Amino is the perfect supplement to take immediately after training since it provides an immediate anabolic effect with a minimum of gastrointestinal distress. It's also extremely useful throughout the day to give a rapid pulsed increase in amino acids and anabolic hormones that leads to short burst increases in muscle protein synthesis. Research has shown that pulses of high levels of amino acids is much more effective in increasing protein synthesis than sustained high levels.

- ➲ Maximizes protein synthesis after training and anytime it's used.
- ➲ Maximizes the anabolic and fat burning effects of exercise.
- ➲ Enhances recovery.

NitAbol

The Complete Night Time Anabolic/ Anticatabolic/Fat-Burning Combo

For Men and Women

INCREASE MUSCLE MASS AND
DECREASE BODYFAT WHILE YOU SLEEP!

Goal of NitAbol is to counter the nighttime postabsorptive catabolic effects, increase recovery, fat burning and protein synthesis.

- ➲ Minimizes the catabolic effects of the postabsorptive phase.
- ➲ Increases fat utilization over protein.

- Increases insulin sensitivity.
- Increases muscle, central nervous system and systemic recovery during sleep.
- Anti-inflammatory effects for increased recovery.

Three Products that make up NitAbol are:

- Myosin Protein Complex.
- TestoBoost.
- GHboost.

Myosin Protein Complex

Myosin Complex is the most advanced synergistic blend of the highest quality protein powders, peptides and amino acids on the market today, bar none. It contains the perfect amino acid mix to maximize protein synthesis, decrease muscle breakdown and enhance athletic performance. Go to **www.MetabolicDiet.com** for details on Myosin Protein.

Directions: 4 to 6 scoops before bed mixed in water or diet drink (no carbs).

6 Scoops of Myosin Protein Complex contains 90 grams of mixed proteins and 12 grams of glutamine peptides.

GHboost

GHboost is formulated to increase muscle mass and decrease bodyfat by increasing the body's natural production of growth hormone (GH) and insulin-like growth factor-I (IGF-I). Because of its effective dual action, it's an advanced growth hormone stimulating product that has been clinically proven to increase GH and IGF-I levels, often well above physiological levels. In one clinical study using GHboost for a six week period, GH levels (measured in the blood by radioimmunoassay—RIA) were increased from 0.2 to 7.4—the normal range was from 0 to 4). The increase in both GH and IGF-I greatly enhances muscle development, strength, and size while decreasing bodyfat.

When used before bed GHboost will increase the natural growth hormone spike associated with the first deep sleep cycle of the night (usually within 2 hours of going to sleep) and enhance the long term increase in insulin-like growth factor I (IGF-I). The combination increase of both hormones increases protein synthesis, decreases muscle catabolism, and increases the use of bodyfat as the main energy source all night long.

NitAbol, the nighttime protein combination, uses GHboost along with TestoBoost (to increase levels of testosterone) and Myosin Protein Complex, to provide a nighttime anabolic, anti-catabolic, fat burning effect that lets you grow muscles and burn bodyfat while you sleep.

Directions: Three tablets before bed.

TestoBoost

TestoBoost maximizes your anabolic potential by physiologically elevating your natural testosterone levels. Not only does TestoBoost contain natural ingredients that increase testosterone formation, it also has ingredients that decrease any potential side effects from conversion of testosterone to estrogens and dihydrotestosterone. By boosting testosterone, TestoBoost has beneficial effects on increasing muscle mass, decreasing bodyfat, and on fertility and impotence.

TestoBoost is all natural and elevates serum testosterone levels without using any prohormones, compounds with potentially serious side effects and very little effects on testosterone levels.

Used at night TestoBoost adds to the anabolic and anticatabolic effects of GHboost to further increase protein synthesis, decrease muscle catabolism, enhance recovery and burn off bodyfat while you sleep.

Directions: For men: Four tablets before bed. For women: one tablet before bed.

Basics Behind NitAbol – The Night Time Stack

Goal – To counter the nighttime post absorptive catabolic effects and increase recovery and protein synthesis.

Sleep dynamics are different from when awake. However, in the Postabsorptive phase there is an increased muscle catabolism especially in second half of the sleep phase.

NitAbol works by:

1. Minimizing the postabsorptive phase by modulating nutrient absorption and effects.
2. Increasing the use of fatty acids and decreasing the use of muscle protein (and thus decreasing muscle breakdown) for gluconeogenesis and oxidation as fuel.
3. Manipulating the anabolic and catabolic hormones to maximize protein synthesis and minimize protein breakdown during sleep.
4. Increasing cell hydration (volumizing) and as such stimulating protein synthesis.
5. Enhancing the Immune System to decrease catabolic cytokines and increase recovery.

Hormonal Manipulation with the Use of NitAbol

- Testosterone – increase.
- Cortisol – decrease.
- Growth Hormone – increase.
- IGF-I – increase.
- Insulin – increase amount and sensitivity.
- Thyroid – control.

Ingredients

Macronutrients – Protein and Amino Acids

Combination of Proteins

- Whey – fast protein – increase GH spike, Increase insulin.
- Casein – slow protein – delay postabsorptive phase.
- Milk Protein Isolate/Colostrum.
- Other proteins – egg, soy – decrease postabsorptive phase.

Peptides and Amino Acids

- Glutamine Peptides.
- Branched Chain Amino Acids.
- Glycine.
- Arginine.
- Lysine.
- Ornithine.

Carbohydrates

- Not necessary as significant amounts will decrease GH and IGF-I secretion and the use of bodyfat as a primary fuel.

Micronutrients

Vitamins and Minerals

- Zinc – enhances testosterone synthesis.
- Calcium & Magnesium.
- Potassium – volumizing.
- Sodium – volumizing.
- Vitamins A, E – anticatabolic & antioxidant.
- Vitamin A – increases insulin sensitivity.
- Vitamin C – anticortisol and antioxidant

Other Ingredients

- Modify IGF-1, GH, Insulin, Testosterone, Cortisol, Thyroid, Glucagon, etc.
- Enhance Immune System – decrease catabolic effects.

NitAbol Controls the Proinflammatory Cytokines

IL-1beta, IL-6, TNF-alpha

Produce a hypercatabolic state—net efflux of essential amino acids from skeletal muscle. Ingredients to combat this include:

- Glutamine.
- Ornithine.
- Vitamin A and Vitamin E.
- Whey, casein, soy proteins
- Milk Isolates
- Colostrum

EFA+

Essential Fatty Acid Formula

For more information and the complete ingredient list and nutrition panel, go to www.MetabolicDiet.com

EFA+ is a multipurpose formulation designed to provide the full spectrum of all the essential and conditionally essential fatty acids that are so important to optimizing your metabolism, maximizing the anabolic and fat-burning effects of exercise and dealing with minor muscle ache and joint pain after exercise.

EFAs are involved in:

- Hormone Production.
- Muscle and Joint Tissue Repair.
- Insulin Metabolism.
- Fat Burning.

Regular supplementation with EFA+ ensures essential and conditionally essential fatty acids, such as omega-6, omega-3, EPA, DHA, CLA, GLA, and ALA are available to support the optimal metabolic response to intense exercise. Antioxidants in EFA+ dramatically enhance the benefits of the EFAs.

With its many ingredients working in concert, EFA+:

- ➲ Optimizes metabolism to make the best use of the anabolic and fat burning effects of exercise.
- ➲ Improves testosterone production and increases growth hormone secretion.
- ➲ Increases the breakdown and oxidation of bodyfat.
- ➲ Increases lean body mass.
- ➲ Improves natural insulin sensitivity.
- ➲ Supports the body's immune system.
- ➲ Decreases inflammation, muscle ache and joint pain secondary to excessive exercise.

Directions: Three soft gels once a day with a meal.

BOTTOM LINE

If you exercise, you shouldn't be without EFA+ since it enhances fat loss, increases lean muscle mass, and allows you to train more effectively with fewer aches, pains and injuries.

Myosin Protein Complex

For more information and the complete ingredient list and nutrition panel, go to www.MetabolicDiet.com

Myosin Protein Complex is the most advanced, synergistic blend of the highest quality protein powders, peptides and amino acids on the market today, bar none. It contains the perfect amino acid mix to maximize protein synthesis, decrease muscle breakdown and enhance athletic performance.

We use a variety of the highest quality protein powder to make use of the special characteristics of each and thus enhancing their overall effect while at the same time eliminating their relative disadvantages. Because of the gentle processes used to isolate the various proteins, the formula maintains the beneficial immune and other effects of the undenatured whey, casein, egg and soy proteins.

Myosin Protein Complex—(Soy protein isolate, egg protein, CFM whey protein isolate, whey protein hydrolysate, calcium/sodium caseinate, and glutamine peptides) combines both fast and slow proteins and peptides that flood the body with an initial large peaked pulse of amino acids and then a sustained release that maintains protein synthesis and decreases muscle breakdown for hours. For this reason Myosin Protein is also useful as a night time protein, especially when used in combination with GHboost and TestoBoost (all three make up my NitAbol combo).

The blend of proteins and amino acids in Myosin Protein is unique and contains the exact amino acid formulation to maximize protein synthesis and minimize protein breakdown. Myosin provides

for a varied spectrum of blood amino acids with spikes from the whey protein, intermediate spikes from the egg and soy, and a prolonged amino acid response from the slowly absorbed casein. Myosin Protein was engineered to increase protein synthesis with spikes of blood amino acids and to decrease protein/muscle breakdown with a sustained low level increase in blood amino acids.

And you can't compare even the most sophisticated whey protein with Myosin Protein. Myosin has all the advantages of the best whey protein on the market, and of all the other proteins, peptides and amino acids that make it up. This is because the body treats the mix of proteins as if each protein was taken separately. Thus these proteins, even when taken together, maintain their different (fast, intermediate and slow) absorption rates. (Boirie Y, Dangin M, Gachon P, Vasson MP, Maubois JL, Beaufrere B. Slow and fast dietary proteins differently modulate postprandial protein accretion. Proc Natl Acad Sci U S A 1997 Dec 23;94(26):14930-5.).

Myosin Protein is also engineered to increase protein synthesis by increasing the anabolic hormones (including insulin and GH thus complementing GHboost) and decreasing the catabolic ones, and by providing the body with an increased immune response to combat overtraining and maximize the anabolic and fat burning effects of exercise.

Directions: 2 to 6 scoops as needed in water, milk, juice or diet drink. Can be used as a low calorie, high protein meal supplement, after training and before bed. 6 Scoops of Myosin Protein Complex contains 90 grams of mixed proteins and 12 grams of glutamine peptides.

MRP LoCarb

The Ultimate Anabolic, AntiCatabolic, Fat Burning Meal Replacement Shake

For more information and the complete ingredient list and nutrition panel, go to www.MetabolicDiet.com

MRP LoCarb is the highest quality, best tasting, most nutritionally complete meal replacement shake on the market today, bar none.

It is the ultimate low carbohydrate meal replacement powder. Unlike some products that only have two or more ingredients and call themselves meal replacements, and others that have more but are still inadequate, MRP LoCarb is an engineered food that contains the full gamut of macro and micronutrients and is truly an anabolic, anticatabolic, and fat burning, full featured meal replacement.

MRP LoCarb is a high protein/low carbohydrate/ moderate fat meal replacement powder containing the most advanced protein blend on the market, healthy fats (mono, poly and some saturated fats along with lecithin and an essential fatty acid blend containing omega-3 and omega-6 fatty acids), soluble fiber, a complete balanced vitamin and mineral profile, and less than 6 grams of carbs per serving!

The protein blend in MRP LoCarb contains a synergistic blend of proteins and a specially developed source of glutamine peptides that was developed for Myosin Protein Complex. It is engineered to increase protein synthesis by increasing the anabolic hormones and decreasing

the catabolic ones, and by providing the body with an increased immune response to combat overtraining and maximize the anabolic and fat burning effects of exercise.

MRP LoCarb, because it's a complete low carbohydrate meal replacement powder, can be used in confidence by anyone on the Metabolic Diet and any low carbohydrate diet plain including Atkins' and Protein Power. It's also useful for those on the Metabolic Diet higher carb plans, or other higher carb diets, because the level of carbs can be easily modified by mixing the powder with milk or juices instead of water or simply by adding carbs in the form of fruits or other carb sources including easily available maltodextrins.

The use of MRP LoCarb within a few hours of training increases the training response and protein synthesis, maximizes rebound macronutrient replenishment and improves recovery. The special blend of proteins in MRP LoCarb, like the Myosin Protein blend, maximizes protein synthesis and minimize protein breakdown for several hours.

Easy to prepare and use, our MRP LoCarb simplifies meal planning and can be taken in place of any meal, as an in between meal and/or before bed snack, and as a delayed post training meal

Directions: Add packet contents to 8-12 fl. oz. of cold water, milk or juice (depending on the carb level of the diet you're on) and mix/blend thoroughly.

LoCarb Sports Bars

For more information and the complete ingredient list and nutrition panel, go to www.MetabolicDiet.com

LoCarb Sports Bars are the highest quality, most nutritionally complete sports bars on the market today, bar none.

The LoCarb Sports Bars have the nutrition and advantages of the MRP LoCarb meal replacement powders in a convenient and delicious bar. The bars can be used post-workout, or as a snack anytime since they can be easily kept on hand by in your gym bag, desk drawer, purse, glove compartment etc.

LoCarb Sports Bars, unlike high sugar and carb sport bars that flood today's marketplace, have a high protein and low carb content and are an ideal snack for people on The Metabolic Diet or who are watching their carb intake. And unlike the other locarb, high protein bars, LoCarb Sports Bars are nutritionally complete, with nutrients that will help you achieve your body composition goals.

The bottom line is that our LoCarb Sports Bars are the ultimate high protein/low carb meal replacement bars on the market today. They have the most effective macronutrient and micronutrient content for maximizing the anabolic and fat loss effects of exercise.

ReNew

Advanced Recovery and Immune System Enhancer

For more information and the complete ingredient list and nutrition panel, go to www.MetabolicDiet.com

ReNew is formulated not only to enhance the immune system, but also to normalize the metabolism, improve recovery, and to naturally support thyroid, testosterone, GH, insulin and the function of the adrenal glands.

It's the perfect nutritional supplement to deal with workout fatigue and to use at the end of a long periodization session.

Your immune system is the first line of defense against stress, whether physical or emotional. ReNew can naturally boost your immunity by providing the necessary nutritional building blocks for enhancing and supporting the immune system. As such, ReNew is useful for optimizing muscle recovery, and reducing the effects of excessive exercise.

ReNew is a premier product that is also part of the Cellusol team. It enhances and stabilizes weight and fat loss and allows the body to return to an optimal metabolic and immune state where it's once again ready and able to respond to the next two Cellusol cycles.

With ReNew you return to a state where the body solidifies previous weight and fat losses and is once again sensitive and responsive to both Thermo and Metabolic. In a sense, ReNew rejuvenates your body so that it is ready and able to make dramatic weight and fat losses.

Directions: Five tablets once or twice a day with meals.

Regulate

Regulate is a potent blend of natural soluble and insoluble fibers, plus probiotic ingredients, formulated for both preventing and treating constipation, frequent bowel movements, and other problems.

Regulate, by delaying gastric emptying and reducing the time to perceived fullness, is effective as an appetite suppressant. Taken before meals or whenever hungry, Regulate lessens your hunger and curbs cravings.

The various soluble fibers and other compounds contained in Regulate have also been found useful to:

- Maintain cholesterol levels that are already within normal range.
- Support a healthy heart.
- Increase natural insulin sensitivity.

- Provide probiotic effects which promote the growth of beneficial bacteria in the bowels.

For more information and the complete ingredient list and nutrition panel, go to www.MetabolicDiet.com

The various soluble fibers and other compounds contained in Regulate have been found useful in the following problems:

- Constipation – especially recommended in the initial stages of the Metabolic Diet.
- Frequent bowel movements.
- Other bowel problems including hemorrhoids, irritable bowel syndrome, and inflammatory colitis (ulcerative colitis, Crohn's disease, diverticulitis, diverticulosis).
- Gallstones.
- Elevated cholesterol levels from whatever reasons including genetic predisposition and a higher fat diet. Regulate results in decreases in total and LDL levels without lowering HDL levels.
- Cardiovascular disease including hypertension and coronary artery disease.
- Insulin resistance and diabetes.

Directions: Five to ten capsules two to three times a day at first. Once regulated take five to ten capsules daily for maintenance. To be taken with at least 8 oz of water. Increasing water intake to at least 8 glasses per day is vital for the beneficial effects of Regulate.

To decrease hunger take 5 Regulate capsules with 10 oz or more of water about 1/2 hour before meals and/or anytime when needed.

Antiox

An advanced antioxidant blend that spares no effort or expense to bring you the best antioxidant protection available today.

For more information and the complete ingredient list and nutrition panel, go to www.MetabolicDiet.com

Antiox is by far the best antioxidant on the market today. With its synergistic blend of powerful antioxidants Antiox provides targeted antioxidant protection to all tissues in the body including the musculoskeletal system and the liver.

Antiox contains the usual antioxidants (including beta-carotene, vitamins E and C, zinc and selenium), and it also contains higher-level (and more expensive) antioxidants and immune enhancers including glutathione, the most important, all-purpose, endogenous antioxidant in our bodies. Our brand of glutathione, unlike most, is absorbed from the GI tract and used both

systemically in all tissues in the body but especially by the liver in its role as the primary detoxifying organ in the body.

As well, Antiox contains other potent antioxidants including lipoic acid, lycopene, resveratrol (from red wine) and grape seed extract.

Directions: One to two tablets twice a day. Can be taken between meals, and/or before training.

MVM

MVM is a comprehensive, specially balanced, multiple vitamin and mineral formula, with added ingredients, designed to provide full spectrum nutrition to anyone who diets or exercises.

For more information and the complete ingredient list and nutrition panel, go to www.MetabolicDiet.com

MVM is the most complete foundational nutritional supplement available for the special needs that the athlete has for body maintenance, recuperation and repair. MVM supplies all the basic nutrients that may be depleted in those who exercise and is formulated to complement all our other products.

Even with the best of diets, it's still possible to have some marginal deficiencies due to depleted soils, the overuse of chemical fertilizers and poor farming, processing, storage and transportation practices. Add that to the fact that most of us don't even eat a well-balanced diet every day, and you can see how important it is for everyone, and especially athletes, to use a high quality multiple vitamin/mineral supplement.

MVM contains a complete mix of all of the important, and more expensive, vitamins and minerals. I formulated MVM to include ingredients and compounds that reflect the latest research information. For example, current research studies on selenium have shown advantages for both sodium selenite and selenomethionine complexes. As such, the selenium in MVM is 50% in the form of sodium selenite, and 50% in the form of selenomethionine.

You won't see a bloated ingredients list in MVM's nutrition panel. When you put out a high quality, high dosage, complete vitamin and mineral formula there's no need to use miniscule sprinklings of bran, kelp, wheat germ, bee pollen, rose hips, and various fruit and vegetable powders, just to give the consumer the impression that they're getting good value for their dollar.

Directions: Two to four capsules per day taken with meals.

Joint Support

A comprehensive formula for joint and muscle pain and inflammation, arthritis and sports injuries.

For more information and the complete ingredient list and nutrition panel, go to www.MetabolicDiet.com

Joint Support is the premier muscle and joint formula in the world. Joint Support has marked anti-inflammatory and healing effects and is useful for treating muscle soreness, acute and chronic injuries and for injury prevention.

With its many ingredients, Joint Support decreases inflammation and maximizes muscle, connective tissue and cartilage repair and maintenance. Joint Support, with its 36 synergistic ingredients, offers much more than any other product on the market today.

- Protects joints and other tissues from the effects of excessive exercise and oxidant damage.
- Provides the ingredients the body needs for the maintenance and repair of joints, ligaments, tendons and muscle.
- Decreases inflammation, muscle irritability and spasm, swelling and pain, and helps heal sore and injured muscle, tendons, ligaments and joints.
- Supports the anabolic and anticatabolic hormones and processes that increase recovery and healing.
- Decreases natural wear and tear on the body, musculoskeletal system and skin.
- Bolsters the immune system.

Besides all the ingredients targeted for the relief of inflammation, muscle and joint pain, and maintenance and repair of musculoskeletal tissues, Joint Support also contains the cutting edge, exclusive, patented, and highly bioavailable, Biocell Collagen II (BC-II). BC-II has also been shown to relieve musculoskeletal pain in various conditions including arthritis and fibromyalgia, and to enhance skin health and elasticity resulting in younger, healthier looking skin.

BOTTOM LINE

Joint Support is the perfect solution for maintaining a healthy, pain free body and dealing with the aftermath of strenuous physical exercise.

Power Drink

Advanced Anabolic, AntiCatabolic, Fat Burning Training Drink

For more information and the complete ingredient list and nutrition panel, go to www.MetabolicDiet.com

Power Drink fills a gap that's been overlooked by all the other supplement companies. While they're absorbed in what to use before and after training, and rightly so, they're missing one of the most important opportunities for maximizing the results you get from training.

We all know that during training muscle is broken down. Most people believe that this breakdown is a necessary part of training. After all you have to break muscle tissue down before you can build it up. Don't you? Unfortunately that's one of the most stubborn training myths. Muscle breakdown isn't what provides the adaptation stimulus for increasing muscle size. It's the damage done to the muscle cell structure and the subsequent adaptation to that damage that determines the muscle building response. You don't have to break down the muscle at all to get this response in full force. In fact doing so is counter productive. The more muscle you keep from breaking down, and the more you increase protein synthesis, the better the results from your training. Taking Power Drink while you're training will put you miles ahead of everyone else who just uses water or at best a carbohydrate, low protein drink.

Power Drink, because of its effects on increasing protein synthesis and decreasing protein breakdown, is a powerful anabolic and anticatabolic product. As well, Power Drink increases cellular hydration and the utilization of amino acids and creatine by working muscle. As if that wasn't enough, Power Drink, because of its positive effects on the fat burning hormones and mechanisms actually allows you to burn more bodyfat while you're training. And with the other ingredients included in Power Drink you can train harder and longer and know that you have a powerful ally that will help you make good use of all that hard work.

Bottom line is that Power Drink is a revolutionary new concept in training drinks. This drink provides the nutrients necessary to increase muscle size and decrease bodyfat. By providing all the necessary ingredients to feed working muscles and shift the use of bodyfat as the energy source for training, Power Drink dramatically increases the positive effects of training, allows you train longer and harder, and increases recovery.

Power Drink is ideal for both those who want to increase muscle size and lose bodyfat and those who simply want to lose weight and bodyfat but maintain the muscle they now have.

Besides the hefty dose (44 grams) of the best quality proteins available anywhere, Power Drink also contains amino acids, electrolytes and other ingredients that will replace and replenish nutrients and fluid lost through exercise, prevent muscle cramps, and increase training time and efficiency.

There is no other product on the market anywhere in the world like Power Drink.

Directions: Mix 2 rounded scoops of dry powder (44 grams) with 22 oz of water, stir or shake well to dissolve.

Metabolic

Advanced Anabolic and Fat Loss Primer

For more information and the complete ingredient list and nutrition panel, go to www.MetabolicDiet.com

Metabolic normalizes and optimizes metabolism and macronutrient utilization (the use of fats, carbs and protein). It also has significant effects on the body's hormonal balance. It increases

levels of growth hormone and testosterone (in both men and women), decreases cortisol levels, increases insulin sensitivity, and optimizes thyroid hormone levels and function. These effects increase weight and fat loss while maintaining or even increasing muscle mass. As well, the hormonal environment created by Metabolic will allow cellulite, that stubborn dimpled fat, to be oxidized along with the rest of the bodyfat.

The ingredients in Metabolic function synergistically to increase the anabolic and fat burning effects of exercise, and to combat fatigue, wear and tear on the body, stress and hormonal dysfunction.

Directions: One to two tablets three times a day. The best times to use Metabolic is before bed, first thing in the morning and in the late afternoon or early evening, preferably about an hour before supper. Use 2 tablets three times a day when calorie intake is severely restricted.

Creatine Advantage

The Ultimate Creatine Product, With Several Synergistic Ingredients Meant to Maximize the Body's Energy Systems.

For more information and the complete ingredient list and nutrition panel, go to www.MetabolicDiet.com

So advanced that it's being copied, but never duplicated, by the major supplement companies.

Creatine Advantage maximizes and enhances the anabolic and energy enhancing effects of creatine. It's the most advanced, and copied, creatine formula on the market today.

While creatine monohydrate has been shown to enhance athletic performance, and to increase strength and muscle mass, these effects are enhanced in Creatine Advantage by stacking creatine with other ingredients. Our formula not only contains the highest quality, pure crystalline creatine monohydrate so that it mixes instantly and leave's no chalky taste, but we've also added a host of other natural ingredients to give our formula an advantage over all other creatine products on the market.

Added amino acids and dipeptides and other essential boosters allow an increase in the absorption and utilization of creatine and increase the volumizing, anticatabolic and anabolic effect of the formula. The added energy ingredients and precursors make Creatine Advantage the ultimate creatine and energy mix, one that will maximize muscle mass and performance.

Unlike many other "advanced" creatine products, Creatine Advantage is based on real science and my expertise instead of hype and false promises.
It has a low carbohydrate based insulin boosting system (glutamine in the form of glutamine peptides—more stable in liquid form and more effective than free glutamine) and compounds to increase insulin sensitivity (chromium, taurine—which also has significant antioxidant and protective effects, stimulates growth hormone secretion and increases cell volume, and alpha lipoic acid—which is also an excellent antioxidant) and thus make the insulin more effective.

It also contains all the necessary products for the synthesis of both high energy phosphate compounds creatine phosphate and ATP, and for the efficient salvage of ATP after it's been metabolically degraded, including:

- The inorganic phosphorus and phosphates—also important for normalizing and regulating thyroid hormone.
- Creatine.
- Inosine.
- Ribose.

On top of that Creatine Advantage contains:

1. Glutamine peptides, which have anabolic (increases protein synthesis and muscle mass) and anticatabolic (decrease muscle breakdown) effects, above those normally associated with glutamine, as the peptides themselves have some physiological effects. Also the peptide form is better absorbed than free glutamine that is not peptide bonded.

As well, the glutamine in the glutamine peptides:

- Regulates protein synthesis.
- Increases both aerobic and anaerobic energy systems.
- Has beneficial effects on the immune system.
- Aids in the prevention and treatment of the overtraining syndrome.

2. Nutrients to facilitate the glycolytic and TCA cycle energy processes:
    - Biotin – a cofactor in many energy reactions involving glycogenolytic, glycolytic, TCA and anapleurotic enzymes.
    - Magnesium – which has also been shown to increase energy systems, insulin sensitivity, protein synthesis and serum testosterone, GH and IGF-I levels.
    - Calcium – which has been shown to facilitate muscle contraction and decreasing fatigue).
    - Potassium – the transport that is linked to aerobic glycolysis.

3. An advanced cell volumizing (resulting in increases in protein synthesis and an anabolic effect) formula containing
    - Glutamine.
    - Taurine.
    - Potassium.

- Sodium.
- Creatine (which has significant volumizing effects).

Directions: Add one portion (10 grams) to 10-12 fl oz of water and stir. Take one serving four times a day for 10 days and then once to twice a day for maintenance.

Appendix 4

Alternate Food List

To get fat, carbohydrate, protein and calorie information on hundreds of common foods, please visit our Nutritional Lookup at:
http://www.metabolicdiet.com/recipe/

Appendix 5

Zero-Carb Foods

To get fat, carbohydrate, protein and calorie information on hundreds of common foods, please visit our Nutritional Lookup at:
http://www.metabolicdiet.com/recipe/

Appendix 6

Free-To-Use Food List

List of Free Foods and Nutrients

The foods, spices and condiments below can be taken freely at any time and can be combined. For example, the lettuces can be sprinkled with vinegar or lemon juice and salt.

Baking Powder

Beef Broth, Bullion, Consume, Canned

Cabbage, Chinese, Pe-Tsai, Raw

Celery Seed

Celery, Pascal Type, Raw, Stalk

Chili Powder

Cinnamon

Club Soda

Coffee, Brewed

Coffee, Instant, Prepared

Crystal Light

Cucumber, w/ Peel

Curry Powder

Diet Soft Drinks

Endive, Curly, Raw

Garlic Powder

Lemon Juice, Canned

Lettuce, Butterhead, Raw, Leaves

Lettuce, Loose-leaf

Onion Powder

Onions, Spring, Raw

Oregano

Paprika

Parsley, Raw

Pepper, Black

Pickles, Cucumber, Dill

Pickles, Cucumber, Fresh Pack

Radishes, Raw

Salt

Sauerkraut

Tea, Brewed

Tea, Instant, Prepared, Unsweetened

Vinegar, Cider

Appendix 7

Sample Diet Programs

Sample diet information and meal plans can be downloaded from http://www.metabolicdiet.com/mdiet_index.htm

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Appendix 8

Bodyfat Charts

ACCU•MEASURE

VISIT US ON THE WEB AT

BODY FAT MEASUREMENT CHART FOR MEN

Body Fat Measurement in Millimeters

AGE	2-3	4-5	6-7	8-9	10-11	12-13	14-15	16-17	18-19	20-21	22-23	24-25	26-27	28-29	30-31	32-33	34-36
Up to 20	2.0	3.9	6.2	8.5	10.5	12.5	14.3	16.0	17.5	18.9	20.2	21.3	22.3	23.1	23.8	24.3	24.9
21-25	2.5	4.9	7.3	9.5	11.6	13.6	15.4	17.0	18.6	20.0	21.2	22.3	23.3	24.2	24.9	25.4	25.8
26-30	3.5	6.0	8.4	10.6	12.7	14.6	16.4	18.1	19.6	21.0	22.3	23.4	24.4	25.2	25.9	26.5	26.9
31-35	4.5	7.1	9.4	11.7	13.7	15.7	17.5	19.2	20.7	22.1	23.4	24.5	25.5	26.3	27.0	27.5	28.0
36-40	5.6	8.1	10.5	12.7	14.8	16.8	18.6	20.2	21.8	23.2	24.4	25.6	26.5	27.4	28.1	28.6	29.0
41-45	6.7	9.2	11.5	13.8	15.9	17.8	19.6	21.3	22.8	24.7	25.5	26.6	27.6	28.4	29.1	29.7	30.1
46-50	7.7	10.2	12.6	14.8	16.9	18.9	20.7	22.4	23.9	25.3	26.6	27.7	28.7	29.5	30.2	30.7	31.2
51-55	8.8	11.3	13.7	15.9	18.0	20.0	21.8	23.4	25.0	26.4	27.6	28.7	29.7	30.6	31.2	31.8	32.2
56 & UP	9.9	12.4	14.7	17.0	19.1	21.0	22.8	24.5	26.0	27.4	28.7	29.8	30.8	31.6	32.3	32.9	33.3
		LEAN				**IDEAL**				**AVERAGE**				**ABOVE AVERAGE**			

Body Fat Measurement Chart for Men

1) Obtain your body fat measurement in millimeters using the Accu-Measure Fitness 2000.
2) Find where the column with your body fat range intersects with the row with your age range.
3) The number at this intersection is your body fat percentage.

BODY FAT MEASUREMENT CHART FOR WOMEN

Body Fat Measurement in Millimeters

AGE	2-3	4-5	6-7	8-9	10-11	12-13	14-15	16-17	18-19	20-21	22-23	24-25	26-27	28-29	30-31	32-33	34-36
Up to 20	11.3	13.5	15.7	17.7	19.7	21.5	23.2	24.8	26.3	27.7	29.0	30.2	31.3	32.3	33.1	33.9	34.6
21-25	11.9	14.2	16.3	18.4	20.3	22.1	23.8	25.5	27.0	28.4	29.6	30.8	31.9	32.9	33.8	34.5	35.2
26-30	12.5	14.8	16.9	19.0	20.9	22.7	24.5	26.1	27.6	29.0	30.3	31.5	32.5	33.5	34.4	35.2	35.8
31-35	13.2	15.4	17.6	19.6	21.5	23.4	25.1	26.7	28.2	29.6	30.9	32.1	33.2	34.1	35.0	35.8	36.4
36-40	13.8	16.0	18.2	20.2	22.2	24.0	25.7	27.3	28.8	30.2	31.5	32.7	33.8	34.8	35.6	36.4	37.0
41-45	14.4	16.7	18.8	20.8	22.8	24.6	26.3	27.9	29.4	30.8	32.1	33.3	34.4	35.4	36.3	37.0	37.7
46-50	15.0	17.3	19.4	21.5	23.4	25.2	26.9	28.6	30.1	31.5	32.8	34.0	35.0	36.0	36.9	37.6	38.3
51-55	15.6	17.9	20.0	22.1	24.0	25.9	27.6	29.2	30.7	32.1	33.4	34.6	35.6	36.6	37.5	38.3	38.9
56 & UP	16.3	18.5	20.7	22.7	24.6	26.5	28.2	29.8	31.3	32.7	34.0	35.2	36.3	37.2	38.1	38.9	39.5
				LEAN				**IDEAL**			**AVERAGE**				**ABOVE AVERAGE**		

Body Fat Measurement Chart for Women

1) Obtain your body fat measurement in millimeters using the Accu-Measure Fitness 2000.
2) Find where the column with your body fat range intersects with the row with your age range.
3) The number at this intersection is your body fat percentage.