CHAPTER 31

AND FINALLY, AT LAST: BODYOPUS

IS THERE SUCH A THING as the "best" fat-loss diet? Doctors, nutritionists and weight-loss specialists would each have a different answer. First, however, they would all agree that the diet would have to be easy to follow. Many diets fail simply because the person can't (or won't) do it. However, easy diets intended for the obese are not my concern. I find it more worthwhile to specialize in people who are at least normal and strive to become extraordinary.

If you already have the discipline to tolerate deprivation and suffering, then the choice of the best fat-loss diet is apparent: one that lets you lose all of the fat you want without losing any muscle. Many diet plans aspire to this goal, but most of them fail. Some are almost, close, near perfect — but none qualify for "best." They all sacrifice muscle.

The BODYOPUS Diet is the best fat loss diet that I know of. In 1982, I published the *Ultimate Dieting Handbook*. Now, after 12 years of experience, I have created BODYOPUS.

BODYOPUS, in one sentence, is: a 7-day cyclic regimen which incorporates 5 days of low-calorie and very low carbohydrate intake, coupled with 2 days of high carbohydrates and

moderately high calories to encourage glycogen supercompensation.

There have been a few similar diets — the Ultimate Diet, the High Fat Diet, the Cycle Diet, the Zero Carb Diet and a few others I'm sure I've slighted. BODYOPUS, although the best, is not completely new. To better appreciate BODYOPUS' elegance, you should know its history.

In addition, BODYOPUS is a *radical* diet — not something you'd find on the cover of the National Enquirer — and it will do you no good if you don't believe it enough to follow it. To better explain some of its more controversial aspects, I will now present the history of BODYOPUS.

CHAPTER 32

BEFORE BODYOPUS

THE IDEA of drastically lowering carbohydrate intake is not new. Eskimos and Inuits are forced to sustain themselves throughout the winter only on protein and fat, eating meat and fish without any carbohydrates. Although these Indians eat this way because they don't have access to other foods, not out of preference, their example does illustrate that such a diet will not malnourish you.

Diets devoid of carbohydrates were recommended before 1900 to control diabetes before the commercial introduction of insulin, and were perpetuated even after insulin became widely available.

For non-diabetics, the earliest low-carbohydrate diet I know of is Dr. Seale Harris' *Hypoglycemia Control Diet* in 1924. Although Dr. Harris devised a diet system that prevented hypoglycemia (very low blood sugar), he probably didn't understand exactly how it worked.

Shortly after World War II, Dr. Alfred W. Pennington, working with the employees of the DuPont Company, made a major advance in understanding the effects of low-carbohydrate diets. His experiments were not designed to control hypoglycemia or cause fat loss (although both did happen), but to

explore the metabolic changes caused by ketosis. Pennington introduced the first ketogenic diet for people who were not diabetic or Alaskan Indian. For many years afterward, this ketogenic diet was out of the public eye. I speculate that the main side effects of the ketogenic diet, high blood acid levels from ketone and lactic acid, alarmed many classically trained MDs, who dismissed it as "hazardous."

In 1963, the first ketogenic fad diet was created by Dr. Walter Bloom. The Bloom Diet cautiously restricted carbohydrates for only 3 days, which skirted the issue of sustained acidosis by resuming carbohydrate intake just when ketosis began. After a year or so, the Bloom Diet disappeared from the American dieters' fancy. I imagine that mainstream doctors criticized the Bloom Diet, but these criticisms faded away as the diet lost the interest of fat-loss hobbyists.

The real popularity of ketogenic diets began with the publication of *Dr. Atkins' Diet Revolution* in 1972. *Dr. Atkins' Diet Revolution* was designed around a prolonged quasi-ketogenic diet that was monitored by checking the quantity of ketone excretion in the urine with the color-changing sticks that had been available to diabetics for years.

Dr. Atkins promoted his diet as a way of eating for life, not just a quick diet for weight loss. His book was immensely popular, with over 6 million copies sold (and still counting). My friends and I used his diet in the mid-1970s, and all of us lost a tremendous amount of fat. My closest friend, who had been obese since childhood, lost over a hundred pounds.

But fad diets aren't popular forever, and Dr. Atkins' Diet was no exception. Medical science contributed to the demise of the diet as much as the passing fancy of the American public. I seem to recall that the entire AMA organization condemned the

Atkins' Diet as dangerous. They repeated the same criticisms: that it caused acidosis and potassium loss. This time, the AMA was also concerned with the staggering amount of saturated fats and cholesterol included in the diet. Dr. Atkins did not sufficiently address these concerns. Although all of these criticisms can be successfully countered, Dr. Atkins did not have the right aggressive attitude. He had stumbled onto the ketogenic diet at a point in his life when he was overweight, depressed and dependent on prescription drugs. The ketogenic diet became his salvation, and carbohydrates were his personal Satan.

The key elements of his diet could be found in the oddest places. When I first became interested in bodybuilding, the preferred method of dieting for a contest was to eliminate broad categories of foods, such as bread, fruit and milk, leaving a diet of meat, fish, eggs and some salad. This was to be followed as long as one could stand it. The cuttest of the cut competitors achieved their condition through a Draconian fish-and-water diet. Dieting for contests was a very macho thing. Diets were supposed to be hard and require discipline. It separated the real bodybuilders from the dilettantes. The whole point of competition was to prove to your peers that you could "go the distance." It didn't matter where you placed as long as you got on stage in great shape.

At the same time, another discipline was developing in the bodybuilding community. The exact opposite of fish-and-water "carb-down" was glycogen supercompensation, a "carb-up." Carb-ups are a method of ramjetting glucose, water and electrolytes into the muscle cell to increase the size and roundness of the physique. While bodybuilders stumbled onto fish and water, the carbing-up technique was stolen from endurance running, where it was developed in the mid-1960s in Europe.

Here's how it works: after depleting a muscle of virtually all of its glycogen stores through a combination of carbohydrate restriction and exhaustive exercise, a curious phenomenon occurs. The two enzymes that hold glucose in the muscle (by sticking some phosphorus onto it and building the glucose into long chains of starches, called glycogen), become more active. If enzymes had brains you'd think that they were planning retaliation. Once glucose is available again, muscle glycogen is replaced to previous levels and then beyond. It's almost like topping off the gas tank in your car. After filling your tank, goosing the pump handle past the initial click will make your tank "super-filled."

For endurance athletes, the extra glycogen meant a longer time before hitting the wall or a few more seconds of all-out sprint. The Energizer Bunny goes from a C cell to a D cell.

Bodybuilders didn't give two hoots about energy. Glycogen and electrolytes carry water along with them. Glycogen supercompensation makes the muscle cells swell. It swelled, and the effect was swell, also. The extra body weight might be a hindrance for a runner, but for a bodybuilder it added size and created a rounder shape.

After a while, the idea of 3 days with no carbohydrates while working out like a maniac, followed by a 3-day carb-up, was known to everyone. It was almost set in stone. At first glance the whole process looks like Dr. Bloom's 3-day ketogenic diet. Yes and no.

Through further research, scientists learned more about severe carbohydrate restriction. The discovered that glycogen supercompensation was caused by an increase in the enzymes that store glucose and heightened insulin sensitivity, which did not absolutely require ketosis. Although eating *no* carbohydrates will deplete glycogen the most, eating *less* carbohydrates will deplete it enough to cause supercompensation. The craziness of the old 3-day carb-down could (mercifully) be loosened up.

During the 1970s, there were two parallel disciplines: the Atkins' Diet, for ordinary sedentary people, and the athlete's carb-down, carb-up energy storage trick. It seems obvious that some smart bodybuilder-type would combine the strengths of the two techniques into a complete system.

CHAPTER 33

KETONES, GLUCAGON AND KETOGENIC DIETS

KETOGENIC DIETS work through metabolic trickery. By "starving" the body of carbohydrates and sugars, two major metabolic changes occur. First, insulin secretion is drastically reduced. If insulin secretion falls low enough, the pancreas (which ordinarily secretes insulin) starts to produce glucagon. You don't hear much about glucagon, because it is not usually secreted in adequately nourished people. Glucagon is considered a catabolic hormone. When glucagon levels rise it's usually an indication that something very wrong is going on, such as starvation or diabetes. However, Eskimos have high glucagon levels for weeks or months at a time and remain amazingly active and hardy. Glucagon is not the enemy — it is secreted for a reason. If we're clever enough, we can use it to our advantage.

Most glucagon never reaches general circulation because it is used in the liver. Glucagon exists to supply the brain with energy to maintain function. Glycogen stored in the liver will be mobilized by glucagon into general circulation so the brain will continue to receive steady energy. However, for dieters, glucagon's raison d'être is to convert fatty acids into ketones.

Ketones are fractured fats created through a process that involves fatty acids, carnitine and glucagon. Presto! After processing in the liver, fats have been transformed into beta-hydroxybutyric and aceto-acetic acids and others. Can we just call them ketones? Fine by me.

Ketones are very cool things. The major advantage of ketones over fats is that the brain can use them for energy. Your brain, even though it has fats in it, will not use fats as fuel. In a ketogenic state (which is when there are more ketones than glucose in the blood), ketones are the primary fuel source. When ketone levels are high enough, muscle cells will use them instead of glucose and fatty acids. This has significant implications.

The ketogenic state reduces muscle catabolism by slowing the conversion of amino acids into glucose. Ketones are also inefficient: a pound of fat converted to ketones yields less than 3500 calories. In addition, ketones that are not used for energy are excreted in urine and respiration, and cannot be converted back into fat.

Wait a minute! If ketosis is so great, why do all of the doctors criticize ketogenic diets? Ketosis is a dangerous condition for sedentary people. However, ketone fuels make the blood acidic only as long as they are cruising around waiting to be burned. Sedentary people will achieve acidosis on a ketogenic diet because they don't require a lot of energy. However, athletes (like Eskimos) will use tremendous amounts of ketones for energy. In addition, the BODYOPUS Diet only causes ketosis for 4 days out of 7 and not for sustained durations, like the old Atkins' Diet. Ketogenic diets are not suited to inactive people, but are ideal for bodybuilders.

Although most glucagon is used in the liver, the amount that does make it to general circulation causes some very nice

direct and indirect (from noradrenaline secretion) fat mobilization. Glucagon seems to decrease fat in areas that are normally very resistant to reduction, like the lower body. Perhaps the combination of low insulin and glucagon's triglyceride disassembly is the reason why ketogenic diets work better than traditional high-carbohydrate, moderate-protein, calorie-restricted diets.

Although we have been thinking of ketogenic diets primarily as fat-loss tools, ketosis also causes the carbohydrate depletion which makes glycogen supercompensation possible. In fact, supercompensation happens most quickly when you have just entered ketosis.

CHAPTER 34

THE REBOUND TRAINING SYSTEM

I CAN'T EMPHASIZE IT strongly enough: The Rebound Training System and its creator, Michael Zumpano, completely changed my life and set me on the path of whatever I have become today.

The Rebound Training System was a cyclic 10-day plan that coordinated a ketogenic diet (but *not* a low-calorie one) with a carb-up phase. All exercise was weight training, incorporating three different disciplines: heavy weights and failure training à la Arthur Jones and Mike Mentzer for intermediate workouts, volume training with high repetitions and sets for the final exhaustive workouts, and power-lifting training after the carb-up. Rebound Training's goal was to help people who had plateaued on every other type of program to grow. Even though the ketogenic phase of the diet didn't restrict calories, Rebound-Trainees lost fat.

When it was released, there were two opinions of the Rebound Training System: either it was a work of genius (which it was) or completely harebrained. Either way, you couldn't argue with the results. Every person who dared to try the bizarre 10-day Rebound Training System had spectacular results. However, there were a couple of factors that kept it from achieving

wide acceptance.

First, people had problems sticking to the plan. The logistics of a 10-day plan interfered with most people's 5-day workweek and 2-day weekend schedule. In addition, the initial stretch of carbohydrate deprivation required more mental discipline than most people believed they had. A carb-fed brain is a happy brain. Enduring the low blood sugar blues before the ketone-induced euphoria was a bodybuilder's idea of diet hell.

Most people didn't want to be called diet wimps and found a better sounding rationale to avoid the system. They said it wasn't healthy, and seemed to have a lot of scientific ammunition to back them up. The diet had lots of fat! Yikes! Eggs and cream and butter and bacon and cheese! Cholesterol, triglycerides, saturated fats, dairy, nitrates — the diet included the whole slimy armory.

I didn't help start Zumpano's Rebound Training System. One day, he just showed up in Gold's Gym in Santa Monica with a mission to change everything in bodybuilding nutrition. I tagged along. He became my best friend, my mentor — and I became an intellectual vampire. My brilliant mind, which had been on hiatus for years since pursuing a performing arts degree, was ready to learn. Reflecting back, I must have been a real pest. I asked a zillion questions.

Frankly, it was a time in my life when I was tremendously unhappy. I had moved to California, hobnobbed with the body elite at Gold's and did the usual rounds of the steroid specialty doctors in the area. I lived the life of the bohemian jock; that is, I lived for bodybuilding contests. Finally, I faced an awful realization — I was a terrible bodybuilder and I would never be better than average. To top it off, I had nothing else I wanted to do in my life.

I had followed all of the correct advice, even the secrets that aren't written in the magazines, and although I had brains, discipline and commitment, I was virtually a failure at bodybuilding. I was shopping for a new salvation.

In retrospect, Zumpano and I were a pair of complementary minds. Zumpano was (and probably still is) a creative, brilliant thinker, although somewhat lazy and undisciplined. I worked to actualize his plans; I was many steps behind him in biochemical knowledge, but a quick study and a detail man. I knew that Zumpano had some terrific ideas meandering about in his head. My job was to coax them out, organize them and put them in a lively and understandable format. Together, we transformed the Rebound Training System into the *Ultimate Dieting Handbook*.

CHAPTER 35

REBOUND REDUX

THE MOST COMMON COMPLAINT about the Rebound Training System was loss of appetite, which caused bodybuilders not to fulfill the diet's calorie requirements. Rebounders were unconsciously dieting, even though Zumpano admonished them not to. To bodybuilders who were hesitant to try the system, but who were familiar with carb-downs, carb-ups and Atkins-type diets, a modified Rebound plan geared to fat loss was an easier sell. The Rebound Training System went on a diet, and re-emerged as the Ultimate Diet.

Although the Ultimate Diet was an excellent weight-loss program, and probably the best system to lose body fat and preserve (or increase) muscle, it was never embraced by mainstream bodybuilders.

I can think of three reasons why the Ultimate Diet didn't catch on. First, it just looked too damn weird. People had forgotten Bloom, Atkins and the fish-and-water diet. The science was valid. People could accept high protein in a diet. They could even tolerate low carbohydrates. But include the panic words *"high fat"* in a diet, and the American social dieting consciousness rebels against what it finds intellectually, emotionally

and almost morally, repugnant.

A modified version of the Ultimate Diet was re-introduced by the Canadian sports doctor Mauro DiPasquale in early 1991. He couldn't have picked a worse title when he called it the *High Fat Diet*. Of course, the words "High Fat Diet" pique interest, just like a clay pigeon in a clear blue sky. The public only considered it long enough to take aim. I have been careful to avoid calling BODYOPUS a high-fat diet. Think of it as a ketogenic diet or as a glucagonic diet.

Of the three reasons, this one is the shakiest. To dismiss it out of hand is, well, *your* loss. Modified ketogenic diets are the best diets. Period.

The second reason why the Ultimate Diet did not achieve wide acceptance was that carbohydrate deprivation regimens are the hardest to follow. Are they complicated? No, but they require a high degree of self-discipline. It's not a Ghandi diet, but it feels damn close. You will not be starving yourself, but your mind will try to trick you into thinking you are. Your brain will be screaming, "Sugar, sugar, *sugar*, now, now, *now!*" Less drastic diets cause less anxiety, which is why I have included the Isocaloric Diet in this book.

A number of athletes who started the Ultimate or BODYOPUS Diet with the best of intentions and full-blown enthusiasm, gave up after 2 days of carbohydrate deprivation. Nobody likes carbohydrate depletion; it's not supposed to be fun. However, it is the ideal solution to achieve a physical zenith.

The book's game plan is to use BODYOPUS as a last resort. It's just common sense to use the two previous diet plans, which work semi-effortlessly and don't cause too many problems or intrude too much into your social or work life. However, when the easier diets stop working, or won't perform well in a limited

time frame or you have too much lower body fat, turn to BODYOPUS. If you tend to lose too much muscle on the traditional diets, then BODYOPUS is the only choice.

Third, the Ultimate Diet was not widely accepted because we didn't invest a lot of time in public relations. We didn't bother trying to convince bodybuilders to believe in Zumpano's diet, to trust it enough to follow it. People were looking for a philosophy, but it was just a snazzy diet that caused anabolic growth without relying on drugs.

At the time, Zumpano and I were not into salesmanship or preaching. Neither of us came off as charismatic zealots. Two unmuscular nobodies, a Gomer Pyle and a tall, big-nosed Maynard G. Krebbs, didn't make an arresting picture. Also, ketogenic diets and subsequent carb-ups don't need a lot of fancy supplements that can be peddled by the major catalogs, er, muscle magazines. Besides, we both had impatient, restless, inquisitive minds that were always looking ahead to new, unexplored territory. Although the Ultimate Diet was a great idea, we had lots of other ideas to explore. Why stick to one that was going to be an uphill battle?

So I forgot about the Ultimate Diet. Over the years I would get reminders, letters from bodybuilders who remembered or somehow had just discovered the *Ultimate Dieting Handbook*. I would also mentally file away interesting metabolic tidbits that explained, amplified or refined the original plan, like carnitine, liver glucose metabolism, MCT to ketone conversion and glucagon (which we didn't even think about back then). Learning of glucose disposal agents prodded me into action. I thought, "Hey, these things could have been very important if we knew about them 12 years ago."

Since 1988, when I revised and expanded the *Underground*

Steroid Handbook, I always had in mind a new diet book that would illustrate the dirty tricks that bodybuilders use to get ready for contests. Since I was focused on steroids at the time, I assumed that the new diet book would be a drug book for dieters. Many bodybuilders were interested in such information. With my infamous reputation, such a book would almost be expected.

I unconsciously put the book off for many years. At first, I thought it was just laziness or writer's block. I now realize I was avoiding it because I wasn't going to be content with another "drug book." Although it's true that it would be harder nowadays to find public acceptance for a steroid dieting book, this was a minor obstacle. Business and money are not my major concern — the writing has to please me and tell the truth as I know it. I don't factor in the payoffs beforehand.

I was avoiding a diet drug book because drugs will not magically solve all dieting problems. Even with drugs, we still face the same problems of muscle loss and stubborn lower body fat. There's no lack of drugs — steroids, anti-estrogens, thyroid hormones, beta-agonists. Just look at the Top 50 list. These drugs cause some remarkable metabolic adjustments, but there is no *one* genie-in-a-bottle, wish-fulfillment drug. Sure, you hear the "drugs are not the answer" diatribe a little too frequently, but when the Steroid Guru says the same thing, take pause. I've *been there*, and BODYOPUS is not the drug diet book promised in 1980.

I would say that the biggest impetus to re-examine the old Ultimate Diet was Mauro DiPasquali's *High Fat Diet*. This diet piqued my interest because Mauro is unusually bright for a doctor. Most jock docs are injury specialists, not nutritionists. DiPasquali was in charge of drug testing a stable of top professional bodybuilders. He had to try to maintain their performance and condition while stopping anabolic steroids cold turkey.

On paper, the High Fat Diet was an ideal choice for drug-free bodybuilders. However, I predicted that he would run into trouble in the same areas where I had problems in the early 1980s — public acceptance and dieter discipline. It would be safe to say that not one of DiPasquali's stable really followed the diet with any fervor.

I looked forward to the details of the High Fat Diet. I had hoped that he would have made major enhancements to the basic plan that Zumpano and I had assembled 10 years earlier. Our use of amino acids, medium chain triglycerides, succinic acid and glucose polymers was quite avant-garde at the time. Although the High Fat Diet did have some refinements (carnitine, different amino acid recommendations, and — its best feature — a more forgiving 7-day rather than 10-day cycle), it omitted significant features.

The diet didn't have specific information on which proteins, carbohydrates and fats to consume. Even worse, the diet did not coordinate nutrition and exercise in any way. Ketogenic-anabolic growth cycles are significantly more effective if you schedule weight training to match the metabolic state of the dieter. Granted, trying to convince a top bodybuilder that his training *must* be changed is usually futile. Most sports doctors and nutritionists don't even try.

What became of the High Fat Diet? Most of the brave new drug-free pro bodybuilders did not achieve top physical condition, and the organization was disbanded. In the aftermath, just about every aspect of the unpleasant experience was blamed, but particularly the High Fat Diet or, as some called it, the High

Fatter Diet. From past experience, I would tend to blame the dieter, not the diet. Although the High Fat Diet didn't go out with any fanfare, out it went.

Before we begin BODYOPUS, I wanted to recognize the contributions of my predecessors, from Bloom to Atkins. Of course, Michael Zumpano and his original Rebound Training System were the real fulcrum. Mauro DiPasquali did much to rekindle my interest in non-drug solutions for the metabolism. And me? I see myself as a very clever intellectual ferret, stealing useable ideas from the damnedest places. Welcome to the elegant assemblage that I call BODYOPUS.

CHAPTER 36

BARE BONES BODYOPUS

ALTHOUGH BODYOPUS will help you lose fat, it is also an integrated nutrition and training system which will trick the metabolism into anabolic growth. It is unique among fat-loss diets because it also increases muscle mass. Most diets concede *some* catabolism, and rely on passive anti-catabolic aids like glutamine and branched-chain amino acids. The cause of the catabolism is usually ignored. The best that passive anti-catabolism can hope to achieve is a slight decrease in the amount of amino acids pulled from the muscle instead of the bloodstream. As you can imagine, passive strategies don't perform well.

BODYOPUS approaches catabolism in an unusual way. By forcing the metabolism into ketosis, the brain will burn ketones instead of glucose. When in ketosis, the brain actually prefers ketones over glucose. Once blood glucose slips below 50, muscle catabolism is reduced, and the gluconeogenic machinery in the liver is significantly revved-up. Scientists know that catabolism is reduced during ketosis, but they don't know why.

In addition to decreasing catabolism, BODYOPUS packs a two-part punch. Although there is nothing we can do about the catabolic action of glucagon, we can rebound into an anabolic

state. We knew some of the reasons for this 12 years ago, but years of additional research have still left some anabolic processes unexplained. Even then, we partly understood how glycogen supercompensation causes extra strength. Heightened insulin activity transports amino acids and glucose into the muscle cell. All of these substances expand the muscle cell.

Back in 1982, we knew that larger muscle cells caused increased strength. We didn't know that this cell volume expansion triggers other still not fully explainable anabolic mechanisms. Although insulin is usually the trigger hormone, many of these anabolic processes are not started with the recognized hormone-receptor messenger signal, but with the mechanical expansion of the cell membrane. As Zumpano intuitively realized years ago, glycogen supercompensation causes a tremendous anabolic response. The new explanations merely vindicate his original theory, and allow us to do some "Ha, ha, ha, I *told* you so" intellectual chortling.

It is absolutely necessary for a fat-loss diet to cause an anabolic response in order to maintain and increase muscle mass. Even if you increase dietary protein, supplement with glutamine or branched-chain amino acids, they won't be magically incorporated into the muscle. The cellular kinetic expansion caused by glycogen supercompensation is an anabolic driver just like steroids and growth hormone.

BODYOPUS is metabolic trickery. Some might call it "alternative." Others will herald it as body salvation. I just call it a cool tool to solve a body problem. BODYOPUS' effectiveness comes both from a decrease in catabolism (as compared to a low-calorie non-ketogenic diet) and an anabolic rebound from kinetic cellular expansion.

Although other dieting strategies can preserve muscle, they

need anabolic drugs to address the deficiencies within the diet. Although such drugs are effective (even cost-effective), new laws, morals and rules from sport organizations have prohibited their use. Although BODYOPUS is unusually labor-intensive tool, it is highly refined.

CHAPTER 37

BODYOPUS IN THE FLESH

I'VE SPENT an unusual amount of space on BODYOPUS' forerunners because ketogenic diets have always been a hard sell. I hope you now believe, as I do, that BODYOPUS is the only practical solution to muscle wasting and stubborn fat. Enough of the salesmanship; it's time for specifics. Many of the components have been discussed previously, so you shouldn't find them terribly strange. I've artfully arranged the nutritional and metabolic tricks you're now familiar with.

The BODYOPUS Diet is a 7-day cycle. The first 5 days of carbohydrate depletion rapidly establish ketosis. The final 2 carb-up days encourage glycogen supercompensation.

As you may remember, ketones are modified fatty acids transformed in the liver by glucagon, insulin's evil twin. Ketones can only be burned when the body is deprived of dietary carbohydrates (bread, vegetables, fruits, juice, milk — it's quite a list of things not to eat).

Once blood glucose is about 50 mg/dl, ketones start being produced. They will continue to be manufactured as long as blood glucose stays below 50. Once ketones are available for fuel, the body prefers ketones over both glucose and fatty acids.

In addition, ketones are inefficient fuels — they yield more energy per gram than glucose, but less than fatty acids.

The 2 carb-up days accomplish many things. By disrupting ketosis, we allow the body to resume insulin secretion, lower cortisol, replenish the muscle cells with the amino acids and electrolytes that were depleted along with the glycogen. In addition to the increased strength from the newly abundant glycogen and increased cell size, the glucose, amino acids, water and electrolytes rammed into the cell by insulin cause an anabolic kinetic cellular expansion.

It is necessary to disrupt ketosis every 5 days to reduce the muscle catabolism caused by glucagon and cortisol. (By the way, cortisol is also a potent fat cell shrinker.) This break allows your body to rebuild the muscle lost during ketosis. This rebound is the major difference between BODYOPUS and other ketogenic diets like Atkins'.

The original Ultimate Diet (the seminal BODYOPUS) was a 10-day cycle. While the 7-day BODYOPUS is more convenient, the 3 days were not cut just for convenience. The 3-day reduction remedies two areas deficient in the initial plan. Practical experience with both the Rebound Training System and the Ultimate Diet showed too many workouts and not enough rest after six to eight 10-day cycles caused overtraining. This problem was fixed in BODYOPUS by incorporating 3 workouts every 7 days instead of 6 workouts every 10 days.

Some applicable research on blood glucose disposal and transport has accrued over the years, and not as much time is needed to descend into ketosis and glycogen depletion. The chief metabolic trick, ketosis, occurs when glucagon is switched on at a blood glucose level of 50. This is a gradual switchover, balancing the glucose and ketones so as to not upset the fuel

supply to the brain. Before, it took an average of 4 days to establish ketosis. Our new nutritional tricks will allow this to happen in 2 days.

Of course, fitting the whole cycle within 7 days makes it enormously attractive for most working people. The really hard part, the carbohydrate deprivation part, is spread out from Monday through (not exactly true, but close enough for now) Friday, which coincides with the traditional 5-day work week. The high-calorie "let's boogie" carbohydrate replenishment falls nicely on the weekends along with, at the same time, no gym workouts.

This 5-plus-2 arrangement is the least intrusive to work, personal, and family interests. In fact, on weekends you will eat and act much like your fellow normal humans. At times it will look like (dare I say it?) you're eating junk food. Between us, we'll call them highly insulinogenic simple carbohydrates. I like to call them Satan sugars because it gives people the willies.

Here's a broad outline of the plan:

Sunday	Begin at 6:00 p.m. Eliminate all carbohydrate foods.
Monday	Today's menu consists of no carbohydrates, moderate protein and high fat. This is a weight-lifting workout day.
Tuesday	Nutritionally, Tuesday is exactly same as Monday. Finish the other half of the body during the weight workout.
Wednesday	Nutritionally, Wednesday is a repetition of

Monday and Tuesday. This is a non-weight-training day, but any reasonable amount of aerobics is fine.

Thursday Thursday is another boring day, with the same diet as Monday.

Friday This is the pain/pleasure day. In the morning you will still follow the no-carbohydrate regimen. By mid-afternoon, you can eat 100 to 200 calories of carbohydrates, just enough to raise blood sugar out of ketosis. In late afternoon or early evening, do the grand depletion workout. After the workout, the high-carbohydrate supercompensation feedings begin.

Saturday Continue glycogen loading. Don't work out at all.

Sunday Continue glycogen loading. The last carbohydrate meal is between 4:00 p.m. and 6:00 p.m. Eliminate carbohydrates from 6:00 p.m. on. Again, don't work out today.

We'll discuss the BODYOPUS workout further on, but to give you a preview:

Monday	Abs, chest, shoulders, traps, triceps
Tuesday	Back, biceps, legs, calves
Friday	Whole body (!) in one workout

CHAPTER 38

OPTIONAL THINGS NEEDED

IF YOU THINK ABOUT IT, the Eskimo "blubber-and-snow" ketogenic diet is as basic as you can get — no need to ever see the inside of either a supermarket or health food store. This idyllic picture is just our quaint notion of what the Eskimos ate; the modern Nanook of the North probably hops on his Ski-Doo to go to the 7-11.

I tend to distrust diets which require you to purchase special foods or supplements. I'm especially sensitive to this because (with a different hat on), I design such specialty foods and supplements, and all probability will develop new products that could be helpful with BODYOPUS. However, I've tried very hard to make this a BODYOPUS Diet Handbook and not a BODYOPUS Supplement Catalog, as many bodybuilding magazines are designed to be. In most cases, BODYOPUS doesn't require any foods that can't be found in the average supermarket.

However, there are special circumstances that might warrant the inclusion of supplements. If you object to the high quantity of saturated fats in the no-carbohydrate phase, you'll need to go to a health food store for the recommended oils. If you will not

eat oily fish, but still want the benefit of omega-3 fatty acids, you can find them in supplement form. Although you could meet the minimum linolenic acid requirements from supermarket soy oil, flaxseed oil is much better.

Additionally, if you don't want to consume red meat, which is a good source of carnitine, creatine and B vitamins, you can substitute a flesh product like fowl or fish (or none at all), and use supplements. Your arrangement may equal or even surpass the quantity of micronutrients in red meat.

In the Ultimate Diet, I advocated the use of MCTs, which convert to ketones quickly. MCTs, unfortunately, are one of those exotic supplements that are not readily available, even in health food stores. Since most MCTs are derived from coconut oil, you can use that instead. Unfortunately, the rest of coconut oil is long-chain saturated fat. Frankly, I have no problem with saturated fats on no-carbohydrate diets. Yes, saturated fats reduce insulin sensitivity, but with no carbohydrates and no insulin, what's the problem? Short chain triglycerides (SCTs) are as readily available to the liver as MCTs, and plain dairy butter can supply you with small amounts of SCTs. Personally, I have problems with both coconut oil and butter; I just don't like the taste of either. I would prefer to only use C-10 MCTs because I have had problems with most commercial blends. However, C-10 MCT supplements are not available yet.

Glucose disposal agents are a trick to hasten ketosis. You have a lot of flexibility at your disposal (ha-ha). Although bodybuilders have embraced chromium, vanadyl sulfate and (my favorite) phenformin, you can substitute with cinnamon and brewer's yeast, which are both potent glucose disposal agents.

I have kind of painted myself into a corner with whey protein. There are no concentrated whey protein sources available

at the supermarket. Although I've read about whey cheese and whey tofu, I've never actually found them at the store. Twelve years ago I was a guinea pig for the Ultimate Diet, going through cycle after cycle, for months at a time. We didn't have whey protein then, and the plan worked anyway. Because I don't consume much meat or fish (as a matter of personal choice), I include whey protein in my diet.

We'll discuss gadgets next, which I have a real fetish for. Gadgets are virtually unnecessary for BODYOPUS. However, since even Eskimos drive snowmobiles, I will include my favorite toys for BODYOPUS.

A food scale is the most essential gadget in my toy box. It's an ideal way to weigh food and measure calories. I've tried them all, from the junky $5 boing-boing spring types to the digital battery-powered ones. They all work well enough; we aren't doing precision lab work here. I've had good luck with a mechanical one from Cuisinart and a really cool traveling digital scale from Brookstone. Neither were cheap. Of course, I have them both.

A bathroom scale is nice, just don't get obsessive over it. I wish there was one that only allowed you to weigh yourself on a timer set every 2 weeks. Many dieters weigh themselves too damn much; morning, night, before and after meals, after bowel movements (it *is* a bathroom scale — maybe we should call it the toilet scale), after a good horoscope. Athletes' and dieters' weights will vary over the day, depending more on water than fat.

If you have ever tried a ketogenic diet before, you've encountered ketosticks, a urine testing strip primarily used by diabetics that will change color from tan to purplish when unused ketones are excreted. Most corner drugstores still stock

them. They should turn purple when blood glucose has dropped below 50 and you are in ketosis. Remember, however, that ketosticks test for *unused* ketones. Low calories and high activity might mean that all available ketones are being used as fuel, and none are being excreted. You may actually be in ketosis, but not have any unused ketones to measure.

Ketosticks are a nifty, fast and cheap tool to see how these tricks work. Of course, calorie quantity, activity, supplements and drugs will all effect the rate of descent into ketosis. If the ketostick doesn't turn purple, you may be using up the ketones, *or* you may be eating too many carbohydrates. Sometimes just 100 calories of carbohydrates over the day can keep blood glucose over 50.

Ketone bodies do not immediately appear when blood glucose reaches 50; it's not an on/off switch. Ketosis usually takes about 72 hours after carbohydrate restriction, although this is considerably reduced if you use glucose disposal tricks. Try taking really effective insulin agonists like vanadyl sulfate right before bed so you can avoid the transient nausea, crankiness and lethargy that low blood sugar causes.

Our next gadget is something that diabetics are familiar with: glucose testing strips. These sticks look similar to ketosticks, but require (yikes!) a pinprick of blood to be deposited on the end of the strip. A color scale displays the number of milligrams of glucose per deciliter (one-tenth of a liter) of your blood. Normal blood glucose is between 80 and 120 mg/dl. Ketosis can begin at 50 mg/dl.

Some strips need to be washed off; others will suffice with a quick dry blot. The old-fashioned strips match the strip color to color scale on the side of the label. It's much easier to use a glucometer, an electronic hand-held device about the size of a

very small Walkman radio that will give you a digital readout of blood glucose. The retail price for such devices is around $100, but most of them have coupons and rebates that bring the actual price down to between $5 and $50. The catch is that glucometers use only one type of testing strip, which happens to be more expensive. Because I am colorblind, I choose the electronic gadgets.

For our purposes, a glucometer is better than ketosticks. However, all hand-held glucometers can be off by up to 30 points. The best time to take a reading is immediately after waking up in the morning. Use the second, not the first, drop of blood. Yeah, it looks creepy, but I think that glucometers will eventually be widely used in athletic nutrition — not to measure ketosis, but supercompensation.

Calipers are last on the gadget list. Lange calipers cost about $160, last virtually a lifetime and can be shared with friends. The $25 plastic Slimguide is surprisingly accurate. It's the best of the cheapies. Both are available from Creative Health Products (800-742-4478). Unless you are a contortionist, you will need an assistant to pinch you in the right places. Medical-quality metal calipers from Skyndex with gee-whiz built-in computers are really only useful in a clinic setting when speed is needed.

Should I mention the "ralphing" pail you'll need on leg day? Frankly, you don't need any gadgets. Just don't eat any carbohydrates for 5 days. Me, though, I got 'em all — even the pail.

CHAPTER 39

BODYOPUS WITH ALL OF THE PLUMBING

IN THIS CHAPTER, you will get to use all of the information you learned in the previous chapters. While some dieters can follow BODYOPUS with the simplest of directions, such as "no carbs for 5 days, then eat like crazy for 2 days," most of us yearn for more precision.

SET CALORIE LEVELS

To set the correct daily calorie level, you should know your regular mixed diet maintenance calorie level. I recommend one of two calorie levels for ketogenic diets. If you don't need to lose a lot of fat, or you're not in a hurry, then (believe it or not) you can eat maintenance calories while losing body fat and preserving muscle. This works because of ketones' fuel inefficiency. Remember, a gram of fatty acid, once converted to ketones, does not yield 9 calories.

If you want to lose more fat per cycle, then eat 10 percent less than your maintenance calories. You can try lower calorie levels if you like, but I've found that beyond a 10 percent debit you constantly feel sick or turn into a Zombie Shuffling Dieter.

FAT-PROTEIN RATIOS

Many athletes eat too much protein. Your diet should contain 25 to 30 percent protein; more is not necessary nor productive. People tend to consume more protein while dieting because they believe that more protein will prevent muscle loss. This only works in ultra-low-calorie, near-starvation diets in which protein is too low in the first place. Most excess protein intake is scavenged by the liver for gluconeogenic amino acids, and the rest is turned into (saturated) fat. This is not an economical way of getting saturated fats. Fat is converted most easily to ketones, not amino acids.

Aside from the 25 to 30 percent protein, the rest of the diet is fat. Although I've stressed that you are to eat no carbohydrates, none, zero, in reality nothing in nutrition should be absolute. Yes, it's important to establish ketosis quickly, and that means "no carbs." Do you realize what "no carbs" means? It means no fruit, starch, juice, milk or most vegetables. Actually, carbohydrates make up most of the wholesome food that you usually eat. Unfortunately, you can't escape trace carbohydrate amounts. It would seem rather silly to avoid dairy proteins. Cheese can contain a gram of carbohydrate every ounce or so. Olives have nice healthy fat in them, but do contain small amounts of carbohydrates. You can cautiously eat some green vegetables like celery and some kinds of lettuce. However, the safest course is to avoid even low-carbohydrate foods until ketosis is established.

SATURATED FATS

It's hard to avoid saturated fats on a ketogenic diet, especially for larger bodybuilders who have unusually high maintenance calorie levels. If your maintenance level is above 6000

calories, very fatty meats and whole eggs may be the only practical way to consume enough calories, unless you can stomach large amounts of MCTs.

MCTs are the most benign saturated fats, because they don't affect insulin sensitivity as other saturated fats do. Since many people have problems digesting them, or even tolerating them comfortably, the best course of action is to divide them equally among the 6 daily meals. Even sensitive individuals should be able to consume at least 700 calories daily. MCTs make ideal ketone substrates. You might burn off more fat without MCTs, but you'll feel much more "alive" if you use them. In addition, high ketone levels reduce catabolism. Ketones are not "anti-catabolic" — they do not reverse catabolism except on high-calorie diets — but on low calories they do slow catabolism.

Whole coconut oil is a distant second to purified MCTs. Remember, other than the MCTs, the rest of coconut oil is as saturated as egg yolk fat. There are more interesting food choices that contain saturated fats.

FISH FATS

This would seem to be an easy call, but remember that fish is not dripping with omega-3s. You'd have to eat a lot of fish, because each serving of fish only has about 50 calories of healthy oil per 4 ounces. Much of the oil in canned fish is added vegetable oil. There's nothing wrong with that, but it's probably not what you expected.

UNSATURATED FATS

Although there are lots of foods to choose from, most whole foods high in unsaturated fats also contain too many carbohydrates. You can't eat things like avocados or whole nuts.

Am I turning out to be a spoilsport or what?

AND THEN THERE'S BEEF

At first glance, the reasons many athletes avoid beef seem valid. Beef protein is not an especially good protein. It's not very digestible or soluble. Its amino acid profile is not ideal for dieting. The fat in red meat is saturated, and beef also contains cholesterol. However, the odd thing is that for most BODYOPUS dieters, high consumption of fatty beef is satisfying, strength-inducing and helps them bitch less about not being able to eat any carbohydrates.

Beef is a tasty source for carnitine, creatine and B vitamins. Yes, we can replace these micronutrients with supplements, and substitute better proteins and healthier fats. Will these high-tech substitutions be better than beef? Only if the trace fats in beef don't influence performance. The latest research is beginning to show that beef fat has drug-like characteristics. It doesn't seem so cut and dried now, does it?

The worst kinds of foods make BODYOPUS fly — bacon, sausage, fried pork skins, hard cheese and whole eggs. The most important thing is to avoid carbohydrates so blood glucose slips below 50 mg/dl.

A number of no-sugar fiber drinks can replace the fiber you'd usually get from eating roughage. If you aren't sure what has carbohydrates and what doesn't, get a paperback carbohydrate counter book at any bookstore. Buy it, read it, memorize it.

MEAL FREQUENCY

We've already discussed the reasons for 6 small meals per day: insulin secretion, blood glucose, muscle cell insulin sensitivity and enzyme activation. As you've noticed, we've allowed

the carbohydrate part of the diet to dictate meal frequency. On low-carbohydrate diets, meal frequency is not terribly important.

However, don't forget that soluble proteins, such as whey, can cause insulin secretion during the first day or so of carbohydrate deprivation. These insulin-boosting proteins can cause sleepiness and transient nausea when blood glucose is between 80 and 50 mg/dl. At this level, soluble proteins make you feel best when they are consumed shortly before bed. Wouldn't you rather that this unpleasantness hit while you are sleeping?

If you decide to use MCTs for a significant amount of your daily calories, eating 6 meals a day suddenly makes sense. The most unpleasant way to eat MCTs is to spoon them in on an empty stomach. Because you can only eat 1 or 2 tablespoons of MCTs at once, you should spread them out over your 6 meals. MCTs hide well in egg whites, a tiny bit of egg yolk and a dash of lecithin.

For the ketogenic part of BODYOPUS, meal number and frequency can be arranged to your convenience. During the 2-day Recomposition phase, it is an entirely different matter. Recomposition *is* a race to increase glycogen deposition before insulin sensitivity returns the body to its sub-optimal condition. Carbohydrate meals must be rigidly planned. Enjoy your ketogenic feeding habits now, because by the weekend you'll find my recommendations to be a pain in the ass.

CHAPTER 40

BODYOPUS COUNTDOWN

IN MY MIND, BODYOPUS really starts at 6:00 p.m. on Sunday, when you stop eating carbohydrates. This is confusing to many diet "shoppers," so we'll start describing the BODYOPUS cycle on Monday.

Monday

Calorie level — On Monday, your total calories should be 90 percent of your normal mixed diet maintenance calorie level. You should eat *no* carbohydrates. For example, if your daily maintenance level is 3000, you would eat 2700 calories on Monday. Protein should be about 800 calories. The rest, all 1900 calories worth, is fat.

Food Types — This will not be fun unless you actually enjoy eating fatty foods. You will eat eggs (white or whole), meat or fish. You are free to use oils and fats for cooking. Flaxseed,

walnut and olive oil are ideal, but corn, canola and soy oils are not evil either. Butter is all right. A very small amount of hard cheese is permissible. The only "junk" food you can eat are fried pork rinds (George Bush's favorite). Fried pork rinds are a chip substitute made entirely of saturated fat and cholesterol — but they are crunchy. Try to include a replacement fiber drink on Monday (one without sugar, of course). Ketogenic diets use up electrolytes, especially potassium, calcium and magnesium, so it's important to supplement them.

Nutrient Ratios

Unsaturated fats and MCTs should be at least 35 percent of daily calories. Fish oils should be included, but it will be hard to get even 10 percent of daily calories from fish fats. The rest of the fat, 25 percent of daily calories, should be monounsaturated and saturated. Although MCTs are nice dietary fats, they will not be terribly effective until the body is in ketosis. For protein, be sure to consume 200 calories of whey protein. The rest is up to you. I've found that trying to meet the protein requirements with blender drinks will only make you hungrier.

Activity

At the beginning of the second cycle, your muscles will be full of glycogen from the weekend carb-up. Train at least half of the

body on Monday. As your blood glucose declines over the day, so will your strength. Try to work out in the morning. You will be strongest on Monday, so train the body parts that need the most intense workout.

Tricks

Glucose disposal agents will speed your descent into ketosis. The milder ones like chromium and cinnamon can be used during the day. More potent ones should be done before bed. OKG may be beneficial when taken on an empty stomach at night, although it may make you feel nauseous.

Aerobics

Aerobics are not recommended because they will affect Tuesday's workout negatively. However, aerobics will speed descent into ketosis, especially if the intensity is above 70 percent maximum heart rate.

Gadget Alert

A glucometer reading upon arising will be informative. You could try a ketostick dip before bed, but most people will show no change.

Mood

You won't be suffering on Monday. Blood glucose will usually be around 80 mg/dl, so you won't be too irritable. The hardest time for dieters is when blood sugar dips to 50. Monday is a big uplifting adventure for most first-timers, who think, "No sweat, I

can handle this. Besides, it's kind of nice to have no guilt eating juicy steaks, bacon and whole egg and cheese omelettes."

Tuesday

Tuesday will probably be the most uncomfortable day of all. Throughout the day, blood glucose will be between 50 and 60 mg/dl. You have not yet reached ketosis, and your brain is screaming for fuel. You won't give in to it, will you? Some individuals will exhibit symptoms of low blood sugar — lethargy, shaky hands, nausea, headaches and just all-around feeling like shit. Some BODYOPUS dieters will have descended into ketosis by early Tuesday and the ketostick will be light purple.

This is the make-or-break day for BODYOPUS. Most athletes don't feel healthy when their blood glucose is below 80 mg/dl. I am perfectly fine with blood glucose below 70 mg/dl, but I have poor insulin sensitivity, hyperinsulinemia and hypertension. Your brain will really play a number on your body. Tough it out. Nanook never went into a diabetic coma squatting over his ice fishing hole. MCTs can really help during the switch to ketosis. Some of the old High Fat Dieters concocted a beverage of ice water, MCTs, baking soda and some diet Kool-Aid for flavor. Personally, I always thought that there wasn't enough baking soda to really alkalize the blood. Think of it as a low blood glucose placebo cocktail.

You can screw around with the workouts, the aerobics and the calorie, fat and protein levels. Just don't eat any carbs!

Calorie Levels Eat 10 percent less than maintenance calories and no carbohydrates. If you're already

in ketosis by early morning and plan to do aerobics after the Tuesday workout, you could readjust calories to maintenance levels, you big crybaby. Between the ketones' fuel inefficiency and the aerobic activity, your body will certainly feel debited.

Food Types Tuesday's diet is similar to Monday, but you can be a wee bit looser with carbohydrates. Eat no more than 50 calories, which is only 12 g. This is not much — just the cream in your coffee and a spoon or two of diet ketchup or salsa.

Nutrient Ratios On a typical 3000 calorie diet, 50 calories works out to less than 2 percent from carbohydrates. See, I'm not completely heartless.

Activity Train the other half of the body on Tuesday. You won't feel as wonderful as you did on Monday. Your muscles will still be fairly filled with glycogen, but because blood glucose is low, you won't be able to do as many repetitions as you're used to. Your strength for the first 3 reps or so will be surprisingly good, but you will not be able to sustain it. Sometimes you will wish you had brought your ralphing pail.

You will have to determine what time of the

day you prefer to work out. Early in the day, most people will still be running on glucose. By mid-evening, you will be in ketosis. Some exercise better when running on glucose in the early morning; others like the ketogenic workout. If you wish to do aerobics after your workout, knock yourself out. You will notice that your respiration will accelerate greatly once you are in ketosis. That burning sensation in your lungs is the respiration of acetone, a by-product of the ketone burning. Be very careful if you light up a cigarette.

Tricks

Monday's tricks will work here. If your glucose stick isn't showing around 60 by early morning, you could use vanadyl sulfate along with chromium and a soluble protein drink.

Gadget Alert

As on Monday, take ketostick and glucometer readings. If you weigh yourself on Tuesday, you will notice a marked drop. It's not all fat, just a lot of water, electrolytes and glycogen.

Wednesday

By now you should have your ketogenic training wheels off. You are in ketosis. These magic ketones will negate much of your hunger. You might even feel euphoric when your brain

starts saying, "Hey, these ketones aren't half bad!" If you've been checking your blood glucose, it will be around 40 mg/dl. If you aren't consuming red meat, you might consider supplementing with carnitine and creatine. Don't lift weights on Wednesday, but any reasonable aerobics will be fine.

On Wednesday, we move into dangerous territory, consuming minute amounts of carbohydrates. As long as blood sugar is at 40 mg/dl or the ketostick is purplish, you can eat a small amount of carbohydrates. Another 50 calories will allow you to throw in some green leafy vegetables. Make sure to check the carbohydrate book because not all greens are the same. I like celery and Romaine lettuce with olive oil. How much should you increase over Tuesday? 50? Maybe more? The ketostick and glucometer can lie so be conservative with carbohydrate intake. Don't get an anxiety attack if your ketosticks aren't purple or the glucometer is above 50. You may have no unused ketones or the glucometer may be way off.

Unless your regular job includes a lot of vigorous activity, Wednesday is pretty much a cruise day. Dieters who cut calories more than 10 percent and added in a high amount of aerobics will feel like they're in slow motion. In this case, coconut oil or MCTs will really give a boost.

Thursday

Thursday is exactly the same as Wednesday. Don't work out except for aerobics. If you get a little antsy from not training for a couple of days, work your abdominals and do hyperextensions for your lower back. Although these exercises are not especially helpful, they're not damaging, either.

Some people ask about the intensity of the ketosis. What if

your ketosticks are deep purple? Is this beneficial? We don't know. If we were sustaining this state for long stretches of time like the old Atkins' Diet, most doctors would be worried. Frankly, I've never seen a BODYOPUS or Ultimate Dieter get that deep into ketosis.

During ketosis, you will have terrible-smelling breath because ketone by-products will escape during respiration. Some individuals will try to mask it with sugar-free breath mints. Unfortunately, many of these contain sorbitol, which is not recognized as a sugar, but is still a carbohydrate. I've seen some people get out of ketosis because they consumed too many sorbitol candies. Aspartame-sweetened gums and candies may help.

You won't be hungry on Thursday. You won't be irritable. But you may be starting to feel a little beat, especially if you do intense aerobics for a long time. Again, MCTs will come to the rescue. Most people who are eating maintenance calories won't feel tired. If you debit food intake by 10 percent (or more) and do a lot of aerobics, you will start to drag by late Thursday afternoon. Although you will burn a tremendous amount of body fat this way, you won't feel like going out dancing later on that night.

Friday

Friday is the most unusual day because you will be progressing through three metabolic states: ketosis, post-ketosis (low blood glucose but out of ketosis) and Recomposition (*lots* of carbohydrates).

Many people dread Friday's workout, but it doesn't have to be terrible. Sure, there are a lot of repetitions and sets, and training the whole body in one workout is unusual. However, it's a monster workout, not a maniac workout. Your goal is to deplete muscle glycogen, not to make Hamlet-length monologues into the ralphing pail. Sprinting from exercise to exercise without a rest between sets will not make it more glycogen depleting. It will just increase the acid level in the blood so fast that you'll get nauseated. Although you should do the sets and repetitions reasonably quickly, strolling leisurely to the next exercise will make the experience more comfortable.

Even if you train too hard and have no appetite after you workout, you *must* eat.

Calorie Levels

For most of the day, you will be in ketosis. Just before your workout you'll want to boot out of ketosis to better deplete the muscles of their last bit of glycogen. Your blood glucose level should be at about 60 mg/dl, and the ketostick should be tan. Remember, though, that there will be extraneous ketones floating about, so the reading won't magically turn from purple to tan within only an hour or two. The Recomposition schedule will dictate calories after the workout, so set daily calories as if the day ended at the beginning of the depletion workout.

Food Types

About 1 to 2 hours before the depletion workout, you should eat 100 to 200 calories of carbohydrate. Although I don't usually recommend fruit to dieters, this is the one

time when fructose, sucrose and glucose will work together to serve our purpose. I like apples because they are crunchy. Others crave bananas.

Nutrient Ratios

Throw the nutrient ratios out the window today. Up to the depletion workout (hopefully in early evening), treat Friday as a complete day of dieting. After that, carbohydrates and calories will be adjusted to the Recomposition formula.

Activity

Friday's whole body 2-hour glycogen depletion monster workout is detailed in Chapter 46, the BODYOPUS Workout Schedule. Monday's and Tuesday's workouts and aerobics were quite flexible, but the depletion workout is more precise. You could do aerobics earlier in the day to burn ketone calories, but I guarantee you will not want to do any aerobics after the 2-hour depletion workout.

CHAPTER 41

RECOMPOSITION RODEO

AFTER DEPLETING your liver and muscle glycogen and increasing your store of glucose-to-glycogen converting enzyme, it's time to replenish. Athletes call this process "carbing-up." Scientists call it glycogen supercompensation.

I'd like to point out some misconceptions about carb-downs and carb-ups. First, muscle glycogen depletion is not necessarily related to blood glucose levels or, for that matter, ketosis. From either complete fasting or simple carbohydrate restriction, blood glucose will eventually drop into ketosis. This is not an indication of the amount of glycogen in the muscles. After enough time, muscle glycogen will become depleted just from minor activity and heat production. However, glycogen depletion from simple carbohydrate restriction will not intensify the enzymes that cause *super*compensation.

True glycogen supercompensation requires dietary carbohydrate reduction *and* vigorous exercise to deplete the muscles. Bodybuilders are uniquely suited to accomplish both requirements because they are better able to accommodate the symptoms of low blood glucose than, for example, endurance runners. In addition, bodybuilders can deplete virtually all skeletal mus-

cle within one workout.

Ketosis actually interferes with glycogen depletion. In a ketogenic state, ketones are the preferred fuel, not glucose. Throughout the week, we've used ketones to manipulate fat energy efficiency. However, glycogen will be used up faster during the grand depletion workout if we turn off the glucagon-carnitine-liver ketone factory. It's simple, really. Just raise blood glucose to about 60 mg/dl and, presto, ketogenic sabotage.

Once the monster workout has depleted the muscle of the last vestiges of glycogen, there is a narrow window of increased insulin sensitivity which is caused by increased permeability of the cell membrane and heightened enzyme activation.

Both insulin sensitivity and enzyme activation are highest within the first hour after the workout, and decline steadily afterward. One of the main reasons BODYOPUS works so well with the genetic non-elite is that many people have very poor insulin sensitivity, compounded by borderline hyperinsulinemia. Muscle cells that are resistant to glucose cause more insulin to be secreted to compensate. This diverts even more glucose from the muscles into the fat cells, and is the reason why middle-aged people don't get the same pump from their workouts.

To supercompensate all of the muscles, they must be worked during the same workout. For runners who are just trying to target the leg muscles, this is no big deal. However, bodybuilders have to work a greater area. Spreading the workout over a few days or even a few hours is not the optimal solution. The muscles worked just before the first carb-up meal will be supercompensated best. Muscles worked days or hours earlier will be compensated, but not supercompensated. Insulin sensitivity and stores of glucose-converting enzyme decline rapidly.

When your muscles have been insulin- and enzyme-sensitized, blood glucose is prioritized first to muscle cells. In a normal or sub-standard metabolism, high insulin levels would load glucose into fat cells. However, this sensitized state allows the high insulin to preferentially fill the muscle cells with sugar. After a vigorous whole body workout, you won't get fat from overeating — even if you eat Satan sugars.

Although the scientists studied supercompensation in runners, their conclusions can be extended to bodybuilders. The research covers two broad areas: timing, which we've just discussed briefly, and maximizing glucose disposal with insulin.

Researchers have tried to influence glucose disposal in variety of ways. The most overt method is to increase insulin through controlled injection. The maximum amount of insulin in the blood under normal conditions is about 150. Although additional insulin will increase glucose disposal, a *lot* is needed. One research study showed maximum glucose disposal to occur at an insulin level of 2400! However, it's saner to raise insulin by selecting carbohydrates carefully. We have a large palette of carbohydrates to choose from, from liquid sugar to long-chain starches.

The carbohydrate sources that have the worst reputation are the best for rapid glucose disposal. Liquid glucose, sucrose and small amounts of fructose maximize blood glucose and insulin secretion. These Satan sugars are the best insulin boosters. However, as the hours progress after the depletion workout, the heightened insulin sensitivity and enzyme levels diminish. Individuals with extraordinary muscle insulin sensitivity will thrive on any kind of haphazard junk food whatever the hour. They'll pull off a supercompensation on 3 days of Sugar Smacks, Twinkies and chocolate milk. For many (probably most) others, such slipshod carb-ups will divert too much glucose into fat