



# QUALITY CONTROL IN FOOD PROCESSING BUSINESSES

## Introduction

Quality control (QC) is not an optional extra in food processing; neither is it something that is only done by large manufacturers. It is an essential component of any food processing business. The purposes of quality control are:

- To protect the customers from dangers (eg contaminated foods) and ensure that they get the weight and quality of food that they pay for.
- To protect the business from cheating by suppliers, damage to equipment (eg stones in raw materials) and false accusations by middlemen, customers or suppliers.
- To be sure that food laws operating in a country are complied with.

Quality control need not be time consuming or expensive and the results of quality control tests should help save money in the long run. In general, the quality control procedures used should be as simple as possible and only give the required amount of information (too little information means the test has not done its job, too much information and management decisions may be delayed or confused).

Quality control is used to predict and control the quality of processed foods. It is no use producing a food, testing it to find the quality and then trying to find a buyer for that particular batch of food. Quality control is used to predict the quality of the processed food and then control the process so that the expected quality is achieved for every batch. This means that quality specifications must be written and agreed with suppliers or sellers and control points must be identified in the process.

## Quality specifications

The quality of foods or ingredients can be measured in different ways but one popular method is to describe 'quality attributes', see Table 1. A specification can then be written and agreed with the supplier or seller, which lists the quality attributes that are required in a food. An example of a quality specification for tomatoes intended for processing into a paste or leather is shown in Table 1.

Attribute	Accept	Reject
Colour	Orange/red	More than 10% green
Size	Any	-
Shape	Any	-
Damage - splitting - insect - mould	Less than 5% Less than 5% None	More than 5% More than 5% Any evidence of mould
Hardness	Soft to oversoft	More than 10% hard

Table 1: Quality attributes for tomatoes

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A number of points arise from such a specification:

- A representative sample of the food must be tested to make sure the whole batch meets the specification (for small batches it might be possible to examine every item). The size of sample needed for testing can be calculated, but this is fairly complex and usually unnecessary for a small-scale business.
- The percentage of substandard items which cause a batch to fail the test can be increased or decreased depending on how reliable the supplier is or how important the particular attribute is to the seller/manufacturer.
- Some attributes may need to be tested using equipment to avoid arguments over interpretation. In Figure 1 the hardness could be tested with a simple 'penetrometer' to define what is 'hard' and what is 'soft'.

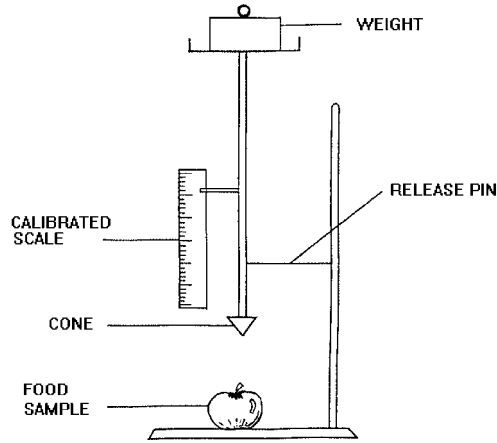


Figure 1: Fruit hardness test using a penetrometer

The size and shape of the tomatoes is not important because they are to be crushed to a pulp. In other examples (eg fruit for bottling) the size might be important. The ripeness and flavour of the tomatoes (assessed by colour and hardness) and damage caused by poor storage and handling are very important and the specification concentrates on these. Each specification takes account of the intended use of the products and the likely important faults that could be expected.

Quality attribute	Example
<b>Quantitative</b>	6
<b>Hidden</b>	
Harmful substances	Aflatoxin in groundnuts
Microbiological	Number of bacteria in a food
Nutritive value	Vitamin content of a food
Additives	Artificial flavours, thickeners etc
<b>Sensory</b>	
Colour	Ripeness of fruit
Size, shape (appearance)	Size of chopped food, particle size of flour
Thickness or texture	Juice consistency, toughness of meat
Taste	Saltiness, sweetness, sourness and bitterness
Flavour	Characteristic flavour of tomato

**Control points**

In every food process there are particular stages which affect the quality of the final product (eg the amount of heating given to pasteurised juices affects the colour, flavour and storage life or in sausage the amount and type of grinding affects the texture of the meat). These stages are identified as control points and quality control checks are made at these points to control the process.

Manufacturers therefore need to identify the control points in their process (using outside

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technical assistance if necessary) and set up a specification for the operators to use. For example, in jam making the amount of pectin, fruit and sugar should be carefully controlled and weighing of ingredients is a control point (weights of each ingredient specified and each carefully weighed out). Likewise the acidity of the jam, the sugar content after boiling and the temperature of filling are each control points. The mix should be checked for correct acidity, the sugar content checked during boiling using a thermometer or refractometer and the temperature checked before filling using a thermometer.

Checks at the control points can therefore be used to control the process and ensure that each batch of product has a similar quality.

### References and further reading

*Food Processing Equipment Design* Technical Brief Practical Action

*Food Processing Building Design* Technical Brief Practical Action

*Food Poisoning & Its Prevention* Technical Brief Practical Action

*Quality Assurance for Small-scale Rural Food Industries: FAO Agricultural Series Bulletin 117*, Food and Agriculture Organization of the United Nations 1995

*Food Hygiene Training: A Guide to its Responsible Management* Institute of Food Science and Technology 1992

*Making Safe Food: A guide to Safe Food Handling and Packaging for Small-scale Producers* ITDG Publishing 1998

*Starting a Small Food Processing Enterprise* ITDG Publishing 1996

### Useful organisations and contacts

NR International  
Central Avenue  
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Food and Agriculture Organization of the United Nations  
Website: <http://www.fao.org/>