FE 376
FOOD QUALITY CONTROL
INTRODUCTION

Quality Control is the evaluation of a final product prior to its marketing. It is based on the quality checks at the end of a production chain.

Quality Categories:

- High Quality
- Regular Quality
- Low Quality
- Nonmarketable

Since, at the end of the production chain, there is no way to correct production failures or upgrade the quality of the final product, therefore

The low quality products → sold at lower prices

The nonmarketable → have to be discarded

Criterias for Quality Control

- Quality Control is an essential component of any food processing
- Quality Control need not be time consuming or expensive
- Quality Control procedures used should be as simple as possible
- Quality Control is used to predict and control the quality of processed foods
- It is no use in producing a food

The Aims of Quality Control

- To protect the customers from dangers (e.g. contaminated foods) and ensure that they get the correct weight and desired quality of foods

- To protect the business from cheating by suppliers

- To be sure that food laws work in a country

What is the Quality in Overall

- Quality is defined as degree of excellence
- Quality is the composite of characteristics that have significance and make for acceptability
- Quality is the combinations of some factors. Some of them are detectable by our senses but some not.

A systematic quality control program involves;

- Customer specifications and market demand
- What level of quality is demanded and can be produced for the price the customer can afford to pay
- What legal requirements must be met
- Then appropriate testing methods and control stations can be set up

Requirements for a systematic food quality control system

1. Policy

The policy should be in written and signed by the company officials

2. Quality Control Manual

A manual must be prepared to show how to do quality control

3. Production Research and Development

From a legal standpoint, one of the most important requirements in developing a new or improved product is documentation.

Accurately prepared records provide a route map for other scientist to follow and often suggest other developments for the products.

i) Quality Goal of Research and Development

The quality system should assure the following specifications:

- Physical and sensory properties
- Product function and nutritive values
- Process equipment and process rates
- Packaging and packaging equipments
- Composition
- Microbiological limitation
- Shelf-life
- Labeling and coding
- Regulatory requirements

ii) Methods and Standards

A checklist for methods and standards must be considered.

To avoid the possibility of overlooking important requirements, such a list should be reviewed at the start of any new development project

iii) Documentation

Progress report are considered the basic documents for development studies.

Reports should be made at six stages:

- Product concept
- Prototype development
- Pilot plant trial
- Qualification testing
- Field evaluation
- Market readiness

4. Raw Material Control

Only defect-free and not more than sufficient raw material must be accepted to the plant.

It is costly to produce satisfactory product from defective raw material.

Because of

- Sorting (process cost)
- Weight loss (from the bought raw material)

5. Production Quality Control

General control of operations may include several functions:

- In-process inspection of materials, products and package functions
- Process verification
- Status identification of raw materials and finished product
- Calibration of test equipment
- Document control; including procedures, specifications, test methods, formulation and quality reports
- Finished-product testing (include examination for attributes)

6. Storage, Handling and Shipping

Damage from improper handling and shipping includes:

- ❖ Leaking or deformed containers
- ❖ Scuffed labels or
- ❖ Crumbled products

Temperature control during storage of frozen or refrigerated products may be critical.

7. Quality Personnel

The four M's considered in industrial engineering system studies are

- ✓ Men
- ✓ Material
- ✓ Method
- ✓ Money

The best quality system will not function without carefully selected people.

Quality Attributes

The quality of foods or ingredients can be measured in different ways but one popular method is to describe «quality attributes»

Quality attributes are classified into three;

- Quantitative
- Hidden
- Sensory (A consumer can evaluate the food through his senses)

I. Quantitative

- Yield; affect only the manufacturer.

It affects the consumer only if he obtains the some product of the same quality at a lower price

- Net weight and drained weight

- Proportion of the ingredients;

  milk/water ratio in milk

  fruit/sugar ratio in jam

II. Hidden Attributes

These attributes are important from the standpoint of health, and consumer cannot evaluate.

Consumer has to known if that food is safe for him or not and also nutritive characteristics of the food.

- Toxic substances → aflatoxin in grandnuts
- Microbiological → number of bacteria in a food
- Nutritive value → vitamin content of a food
- Additives → artificial flavor, thickeners

III. Sensory

- Appearance factors: Size, shape, wholeness, damage, color, transparency
- Textural factors: Hand feel, mouth feel of firmness, softness, juiciness, chewiness
- Flavor factors: sweet, salty, sour, bitter, acid, burnt

Control Points

In every food process there are particular stages which affect the quality of the final product (e.g. The amount of heat given to pasteurized juices affects the color, flavor and storage life). Therefore;

Manufacturers need to identify the control points in their process and set up specification for the operators to use.

For example, in jam making, control points;

- The amount of pectin, fruit and sugar
- The acidity
- Sugar content after boiling
- Temperature of filling

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