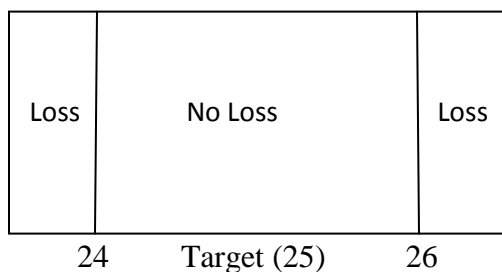


Quality

Today, there is no single universal definition of quality. The definition of quality depends on the role of the people defining it. Most consumers have a difficult time defining quality but anyway, some of the more common definitions of quality have been given below.

Conformance to specifications measures how well the product or service meets the targets and tolerances determined by its designers or producers. For example, the protein content in cheese specified as $25\% \pm 1$. This would mean that the target content is 25% but the content can vary between 24 and 26%. Figure shows traditional view of cost of nonconformance.



Fitness for use focuses on how well the product performs its intended function or use. It means that fitness for use is a user based definition in that it is intended to meet the needs of a specific user group. For example, if a factory (company) claims that its yoghurt enhances digestion and another factory (company) claims that its milk has antihypertensive capacity. If their claims are met after the usage of products, then the products meet the definition of fitness for use. It means that fitness for use is a user based definition in that it is intended to meet the needs of a specific user group.

Value for price paid is the only definition that combines economics with consumer criteria. It assumes that the definition of quality is price sensitive. Quality is the degree of excellence at an acceptable price. Goods that are very intensely traded (e.g. oil and other commodities) usually are sold based on cost-based pricing. The prices based on value-based pricing are always higher or equal to the prices derived from cost-based pricing. Value-based-pricing is most successful when products are sold based on emotions (fashion). Survey methods are sometimes used to determine value a customer attributes to a product or a service. The results of such surveys often depict a customer's willingness to pay. The principal difficulty is that the willingness of the customer to pay a certain price differs between customers and between countries, so that a true value-based pricing at all times is impossible. Also, extreme focus on value-based pricing might

leave customers with a feeling of being exploited which is not helpful for the companies in the long run. The drinks being sold at open air festival in a hot summer day at very high prices which are also acceptable for consumers came at festival.

Psychological criteria is a subjective definition that focuses on the judgmental evaluation of what constitutes product or service quality. Different factors contribute to the evaluation, such as the perceived prestige of the product. For example, if national or multinational organizations or companies have good infrastructures and previous reputation for their products then customers rely on these already established and well reputed companies.

Quality defined by manufacturing and service organizations

Defining quality in manufacturing organizations is often different from that of services. Manufacturing organizations produce a tangible product that can be seen, touched, eaten and directly measured.

Manufacturing organization	Services organization
Conformance to specification	Responsiveness to customer needs
Reliability-function without failure	Courtesy/Friendliness of staff
Features-characteristics	Promptness/Timeliness in resolving complaints
Durability-shelf life stability	Atmosphere

In contrast to manufacturing, service organizations produce a product that is intangible. Usually, the complete product cannot be seen or touched. Rather, it is experienced.

Examples include delivery of health care, marketing the products of companies, and learning at a university or a research station. The intangible nature of the product makes defining quality difficult.

Methods for determining quality

Following are two methods for determining quality:

(1) Subjective Methods

The methods are based on the evaluators or investigators opinion and consist of

1. Physiological reaction resulting from prior training experiences
2. Personal preference and perception

These methods are also referred to as sensory methods as they involve the various sense organs. Examples are color, flavor or touch etc.

Objective Methods

These methods are divided into three general groups.

(1) Physical Methods

These methods deal with such attributes as

1. Size
2. Texture,
3. Color
4. Consistency
5. Imperfection

And also process variables

1. Headspace
2. Fill weight
3. Vacuum

(2) Chemical Methods

These methods are used for

1. Quantitative evaluations
2. Determination of nutritive values

These methods are used to determine

1. Moisture
2. Soluble solids
3. pH and acidity etc

(3) Microscopy Methods

These methods have excellent applications in quality control (QC) programs. They require considerable training to interpret the results. These are used to indicate the presence of bacteria, yeast, mold etc. in various stored foods.

Food quality

Food quality is the extent to which all the established requirements relating to the characteristics of a food are met. Following are the quality characteristics of food:

- Identity of a food in relation to a standard
- Declared gross or net quantity of a unit of the food or net fill of a food container
- Declared or claimed amount of one or more stated components of a food

- Appearance
- Flavor
- Aroma
- Texture
- Viscosity
- Shelf life stability
- Fitness for use as human food
- Wholesomeness
- Adulteration
- Packaging and Labeling

The Codex Alimentarius defines the term **food suitability** as the assurance that food is acceptable for human consumption according to its intended use, food suitability criteria include

1. Fitness for human use
2. Wholesomeness

Food safety

Food safety is the assurance that food will not cause harm to the consumer when it is prepared and eaten according to its intended use. The assurance that a food will not cause harm, injury or illness is determined by:

- (1) Whether all harmful substances present in the food have been eliminated, reduced to an established acceptable level, or prevented from exceeding the acceptable level.
- (2) The food has been prepared, handled and stored under controlled and sanitary conditions in conformance with practices prescribed by government regulations. The prescribed conditions and practices for preparing, handling and storing food are considered good manufacturing practices (GMPs) and sanitation standard operating procedures (SSOPs).

A food that does not conform to the food safety requirements automatically does not conform to the food quality requirements. On the other hand, a food can conform to the food safety requirements but not conform to the other quality requirements.

Management

Coordinated activities to direct and control an organization.

Organization

Group of people and facilities with an arrangement of responsibilities, authorities and relationships. Following are different types of departments which an organization may have:

1. Purchasing
2. Production
3. Marketing
4. Research development
5. Services
6. Administration
7. Finance
8. Human resources

Quality management

Coordinated activities to direct and control an organization with regard to quality. The totality of functions involved in the determination and achievement of quality.

Total Quality Management (TQM)

It is a management approach to long term success through customer satisfaction. It is based on the participation of all members of an organization in improving process, products, services and the culture in which they work. Many techniques have been given for implementing TQM.

Quality assurance (QA)

Part of quality management focused on providing confidence that quality requirements will be fulfilled. All those planned or systematic actions necessary to provide adequate confidence that a product or service will satisfy given needs. It is the systematic measurement, comparison with a standard, monitoring of processes and an associated feedback loop that confers error prevention. This can be contrasted with quality control, which is focused on process outputs.

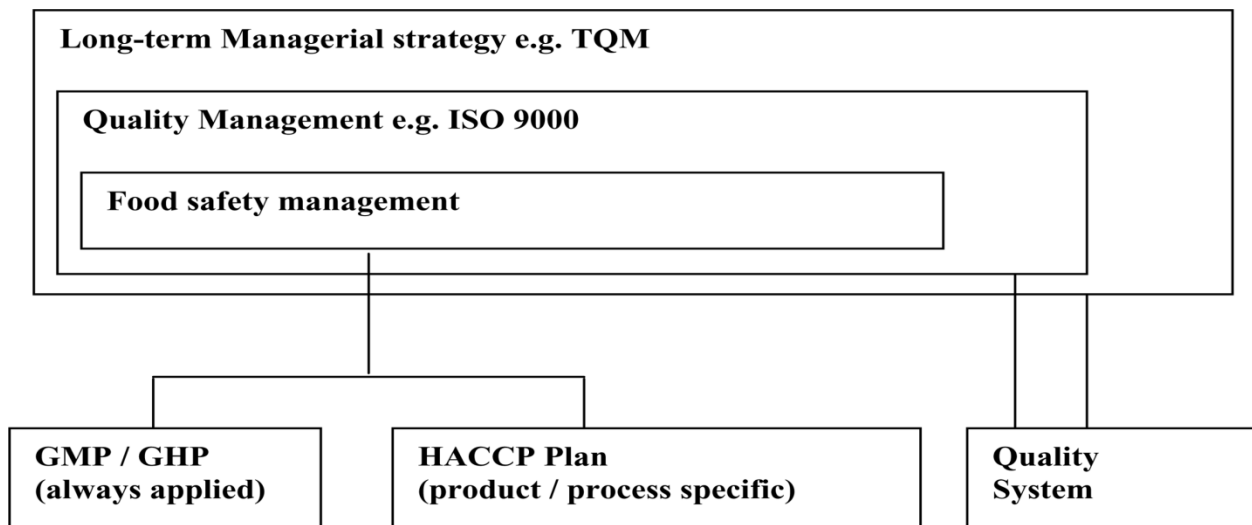
The QA includes management of the quality of raw materials, assemblies, products and components, services related to production, and management, production and inspection processes.



The **Food Quality Assurance** Program consists of four sections that conduct a variety of inspections, audits, registrations and certifications of agricultural commodities and facilities to provide consumers with safe, high quality agricultural food products.

Quality control (QC)

Part of quality management focused on fulfilling quality requirements. The operational techniques and activities that sustain a quality of product or service that will satisfy given needs. For example, statistical quality control techniques on process output or testing



Source: Jouve *et al.* (1998)

Cost of quality

Following are the four types of cost of quality:

(1) Prevention costs are all costs incurred in the process of preventing poor quality from occurring. They include:

1. Quality planning costs, such as the costs of developing and implementing a quality plan.
2. Costs of product and process design, from collecting customer information to designing processes that achieve conformance to specifications.
3. Costs of maintaining records of information and data related to quality.

(2) Appraisal costs are incurred in the process of uncovering defects. They include the

1. Cost of quality inspections, product testing, and performing audits to make sure that quality standards are being met.
2. Costs of worker time spent measuring quality and the
3. Cost of equipment used for quality appraisal.

(3) Internal failure costs are associated with discovering poor product quality before the product reaches the customer site.

One type of internal failure cost is **rework**, which is the cost of correcting the defective item. Sometimes the item is so defective that it cannot be corrected and must be thrown away. This is called **scrap**, and its costs include all the material, labor and machine cost spent in producing the defective product.

(4) External failure costs are associated with quality problems that occur at the customer site. These costs can be particularly damaging because customer faith and loyalty can be difficult to regain. They include everything from

1. Customer complaints
2. Product returns and repairs
3. Warranty claims
4. Litigation (legal proceeding in a court) costs resulting from product liability issues

Finally, it leads to lost sales and lost customers.

For example, if expiry dates of bread and milk are over or the products are defected, then whole sellers or retailers return products to manufacturers. Higher production than demand may also lead to external failure costs.

Companies that consider quality important invest heavily in prevention and appraisal costs in order to prevent internal and external failure costs. The earlier defects are found, the less costly they are to correct. For example, detecting and correcting defects during product design and

product production (Location of defect) is considerably less expensive (cost of defect) than when the defects are found at the customer site.

