

## Session 4.3 Quality assurance and food safety

### Key learning points



- What is food quality?
- Quality assurance standards
- Food safety legislation
- Due diligence and traceability
- International standards
- Total quality management
- Standardisation and other concerns

### Main objectives of the session

By the end of this session, participants will be better able to:



- Understand alternative consumer perceptions of food quality
- Understand the basic European food standards legislation and quality assurance schemes and their impact on fresh fruit and vegetable production and marketing
- Prepare a quality assurance standard, specification and procedure
- Trace products effectively through production and marketing
- Complete hazard analysis assessments
- Follow total quality management approaches
- Understand the impact of international standardisation on growers and market intermediaries

### 4.3.1 What is food quality?

The purpose of food is for either human or animal consumption and it may be viewed simply as sustaining or improving the quality of life and as a nutritive or medicinal compound. This is of particular importance in underdeveloped economies and so too is food safety. Consumer safety has become one of the most critical and priority issues for the food supply chain.

However as economies develop quality assurance in the food industry has focused on the increasing awareness by consumers not only of food safety (which is expected) but also to increasingly higher demands for consistently better quality (which is perceived). Customer expectations and perceptions (taste, smell, freshness, visual appearance) have become of ever increasing importance. Even taste quality standards have also been timidly introduced into some marketing requirements, such as juice, or sugar content, acidity or dry matter content.

Phytosanitary issues are increasingly paramount and need to be supported by traceability of produce from the grower and through the entire market chain. Wider environmental implications, such as, chemical applications and pesticide residues, food hygiene, ethical trade and production methods may also need to be considered as part of a “quality assurance” package.

The fresh produce sector has received relatively little adverse publicity with regard to food safety, largely due to consumers’ perceptions of fresh produce as being “natural” and inherently “healthy”. However consumer concerns over pesticide residues, health hazards and the expectation that fresh produce will be handled in clean, hygienic conditions has led to greater efforts being required by producers and exporters to ensure the acceptability of produce from all over the world. Companies focusing on quality are not only able to ensure a greater degree of food safety but also to access higher value domestic and export markets. But quality assurance is essential to satisfy not only consumer demand but also the legislative requirements of the European market.

The quality of the product is one of the most important factors of any organisation and yet quality may be perceived in a number of ways. Broadly it may be defined as:

“ The degree of excellence in a product or system”

Within the food sector quality means focusing on three key areas:

- ❑ Fitness for the purpose for which it is to be used
- ❑ Safety
- ❑ Customer expectations and perceptions

For the large majority of consumers the first two are essential but wider quality expectations of consumers incorporate a variety of factors. Value, taste and appearance provide the key basis for assessing product quality for the vast majority of consumers but more “food aware” or concerned consumers might also consider, country of origin, production systems, packaging, nutritional value and even ethical production factors. Very few customers however will tolerate inferior goods or services. If quality varies customers will not know what to expect and as a result they will stop buying it. The actual quality of a product has to be decided, and at a price customers can afford. It is

necessary to ensure a consistent product every time in order to develop long term and trustworthy customer relations. This requires the establishment of detailed standards for an organisation so as to be able to produce and market a product consistently and everyone within the organisation will have to be trained to meet these standards.

Important components of a food quality system are:

- ❑ The commitment to quality management by management, owners and staff
- ❑ The training and development of all persons in their roles and responsibilities
- ❑ A focus on problem prevention, problem solving and continuous improvement
- ❑ A documented system that can be easily followed and modified as required.

### 4.3.2 Quality assurance standards

Product specifications need to be developed in order to ensure that the farm/company is able to maintain its quality standards and reputation within the market. Most companies will need detailed specifications as to the quality of produce to be delivered as well as procedures to be followed for picking, storage, delivery and transport.

Companies without these controls are rarely successful and unable to add value for the client by accepting all produce whatever the quality or availability. The following is an example of a product specification and procedure developed for a strawberry growers association and prepared against EU export classifications:

#### **Fresh fruit specification for strawberries**

##### **EU Class 1 specification**

<i>Size</i>	Fruit should not exceed 25mm in diameter
<i>Shape</i>	Fruit should have no defects in shape e.g. monkey face malformation (Growers who are unsure of an acceptable shape should refer to the illustrations provided)
<i>Calyx</i>	The fruit should have the calyx attached. The calyx should be bright green and have a short stalk
<i>Uniformity</i>	The fruit should be uniform within the package and the top layer of fruit should be displayed with the calyx downwards
<i>Defects</i>	The fruit should be free from bruising and defects either mechanical or handling
<i>Pests and diseases</i>	The fruit should be free from areas of pest and disease damage.
<i>Ripeness</i>	The fruit should be uniformly ripe
<i>Packaging</i>	The fruit should be packed in correct and clean packaging. A quality control label should be applied to each pack
<i>Foreign matter</i>	The fruit should be free from any non vegetable matter e.g. stones, soil, insects, caterpillars, wood, metal, plastic etc. The fruit should be free from extraneous matter from the strawberry plant or originating from any other plants e.g. weeds

##### **EU Class 2 specification**

<i>Size</i>	Fruit below 25mm and large mis-shapen fruit will be allowed
<i>Shape</i>	Malformation of the fruit is allowed. However the fruit should be sound

<i>Calyx</i>	Fruits may have no calyx or it may be partially attached. Fruits with discoloured calyx and no stalk are also permitted
<i>Uniformity</i>	Fruits of all sizes may be mixed within the punnet
<i>Defect</i>	Some bruising and mechanical damage is permitted. No more than 10% of the berry may be damaged
<i>Pests and diseases</i>	Small amounts of pest damage is allowed, but no diseased berries
<i>Ripeness</i>	Overripe berries may included as long as they are sound
<i>Packaging</i>	Fruit should be packed in clean packaging
<i>Foreign matter</i>	Fruit should be free from any non vegetable matter e.g. stones, soil, insects, caterpillars, wood metal, plastic etc. The fruit should be free from extraneous matter from the strawberry plant or originating from any other plants e.g. weeds

Procedures are also often established by buyers or by groups of growers for picking and delivery of their produce. This is in order to ensure a better quality product and delivered in line with customers expectations. Examples of picking procedures for fresh strawberries are shown below:

- ❑ Picking should begin early in the morning, preferably before 06.00 am
- ❑ Fruit should be picked into the final pack in the field
- ❑ Fruit should be picked to class 1 specification wherever possible. Class 2 fruit should be picked into a separate container and advice sought from the group marketing office
- ❑ Fruit should be handled carefully. Fruit should be picked by the stalk to avoid handling the berries. Fruit should not be 'plucked or pulled' from the truss, but the stalk should be severed from the truss between the pickers thumb and forefinger and placed carefully into the pack
- ❑ Packs should be placed within the final selling tray in the field
- ❑ Fruit should be rapidly moved either to a cold store or a cool place to await dispatch
- ❑ Packs and trays should be maintained clean
- ❑ The marketing office should be informed daily of what fruit is being picked including quality and quantity

### 4.3.3 Food safety legislation

In the European market, quality assurance is essential to satisfy, not only consumer demand, but also legislative requirements. In the EU food law covers, the composition and labelling of foods, chemical safety and hygiene plus a number of specific regulations, in areas such as product specification. A new food law to be introduced in 2005 will also include issues related to traceability. EU food law is coordinated by the European Food Safety Authority (EFSA) but individual countries also maintain their own agency responsible for implementing national and European standards.

Although fresh produce is generally considered a low risk commodity, risks to consumer health and safety can result from both production and produce handling. Sources of risk include;

*Physical Hazards:* Such as; staples (from packing boxes), nails, screws, bolts, pieces of glass and wood splinters

*Chemicals hazards:* Such as; pesticides, fungicides, herbicides, rodenticides, lubricants, heavy metals (lead, mercury, arsenic), cleaning and sanitising materials

*Human and environmental pathogens:* Such as; soil associated pathogenic bacteria, faeces associated pathogenic bacteria, pathogenic parasites and viruses. These may be transmitted in a number of ways, including; poor general hygiene, human sickness, contaminated irrigation water or inadequately composted manure.

While physical contamination of fresh fruit and vegetables can mainly be dealt with at the washing, packaging and processing level, microbial and chemical risks generally originate during the farming, growing and harvesting processes. Good management is therefore required throughout the production and distribution processes to prevent physical, chemical, human and environmental pathogen contamination.

Most countries have standards for acceptable levels of chemical residues on produce and the EU is in the process of establishing EU wide maximum residue levels. Substances for which no EU or national level exists must obtain an "import tolerance" certificate. There are also other country restrictions in areas such as use of antibiotics, use of waxes or genetically modified production. Some customers may require that routine, random pesticide residue analysis be carried out. The procedures and frequency of such tests vary with the risks and degree of control that packers and exporters have over growers and subsequent operations.

There are also strict laws governing entry of food into all countries of the European and food safety rules for fruit and vegetables are stringently applied. Food laws allow enforcement officers to inspect and seize, at any time, food intended for human consumption and if suspected of not complying with food safety requirements. If a container is selected for sampling it can be held up for two or three days while the contents are examined. If the cargo does not pass the examination the whole contents may be condemned. It is the legal responsibility of the importer to ensure that products conform to local market food safety requirements. A breach of the food safety law, and a subsequent conviction, can mean a large fine and in extreme cases imprisonment. There are also enormous commercial costs incurred through a breach of contract, a total recall of the product and damage to the brand name.

Less stringent inspections may be applied to imported product if the product has already been passed by a licensed authority an already approved source country and in particular between destinations between member countries of the European Union.

#### **4.3.4 Due diligence and traceability**

Under EU food law it is farmers and food processors that have the primary responsibility for food safety. However, often the only defence an importing company may have against potential prosecution and following a food safety incident, would be to prove that they followed a process of "due diligence". This means that they must show that produce has been handled correctly throughout its life.

Due diligence defence is effectively two things:

- ❑ The taking of all reasonable precautions. This means identifying the potential risk and having means in place the means of preventing or reducing it
- ❑ That records are available to prove the action and that everyone in the chain of production is aware of the risks and has taken the appropriate action

Traceability is a key issue in relation to food quality assurance. An effective and cost-efficient traceability system can pinpoint problems to a specific region, packing facility, group of growers, a grower or even a field, rather than an entire commodity group.

Some farms and businesses start with the low cost option of an internal scheme designed with professional help, which can be verified internally, but is suited to inspection by third parties, (such as customers food technologists) and so to give the necessary consumer assurance. Major retailers will also expect to carry out their own food safety tests, particularly on new products or products received from new suppliers and including checks on all ingredients and chemical composition and even to check supplier premises prior to agreeing contracts. In the long term it is likely to make business sense to commit to an externally devised and verified scheme. This will mean working with others to cover the relevant industry, sector, company or product specific, such as those devised by trade associations, supermarkets or producer groups.

Such schemes are designed to strengthen an organisations ability not only to demonstrate due diligence throughout the supply chain but they can also give participants a marketing advantage by demonstrating consumer assurance on a collaborative basis.

Fresh produce traceability (FPT) guidelines have been developed between Eurohandelinstitute (EHI), the European Association of Fresh Produce Importers (CIMO) the Euro Retailer Produce Working Group (EUREP) the European Union of the Fruit and Vegetable Wholesale, Import and Export Trade (EUCOFEL) and the Southern Hemisphere Association of Fresh Fruit Exporters (SHAFFE). The adoption of food produce traceability (FPT) guidelines is voluntary and they specifically address EAN-UCC numbering and bar coding for the purpose of tracking and tracing fresh produce. The guidelines cover trade units (i.e.) cartons, boxes or bins) and logistics units (e.g. pallets) but so far do not cover consumer units (e.g. loose or pre-packed produce).

### **4.3.5 International standards**

There are more than 20 food safety assurance schemes plus numerous industry codes of practice, retailer schemes and certification systems operating across Europe. These are voluntary and have been developed by the industry to establish production standards for a wide range of foods. They often cover not only food safety but also other issues such as environmental protection of quality assurance. Although food assurance schemes cover around 65% of food production in Europe it is still sometimes difficult for consumers to make informed choices about buying food as each have different standards in relation to operation, disclosure, record keeping, transparency, monitoring and use of logos. Some of the more widely recognised schemes are highlighted below.

## **ISO 9000**

The ISO (International Standards Organisation) 9000 is a quality system aimed primarily at preventing and detecting nonconformity during production and supply and implementing the means to prevent its recurrence. ISO 9000 was initially implemented by the food-processing sector but has been extended into other industrial areas, including for fresh fruit and vegetable production, packing and distribution.

The ISO standard requires an objective evaluation of:

- ❑ Organisational structures
- ❑ Administration and operational procedures
- ❑ Personnel, equipment and material resources
- ❑ Work areas, operations and processes
- ❑ Conformations to standards and specifications
- ❑ Documentation reports and record keeping

In detail the quality system outlines 20 requirements that have to be specific detailed and monitored and in relation to:

1. Management responsibility
2. The documented quality system
3. Contract review
4. Design control
5. Document and data control
6. Purchasing (materials, skills and services)
7. Control of customer supplied product/data
8. Product identification and traceability
9. Process control
10. Inspection and testing
11. Inspection, measuring and test equipment
12. Inspection and test status
13. Control and non-conforming product
14. Corrective and preventative action
15. Handling, storage, packaging, preservation and delivery
16. Quality records
17. Internal quality audits
18. Training
19. Servicing
20. Statistical techniques

## ***Hazard Analysis Critical Control Points (HACCP)***

It is not (yet) possible to control a living plant like a production line so despite good controls and systems some poor quality produce may still be produced. The aim however must be to minimise the risks of this occurring. Of ever increasing importance and probably the most effective tool for proving due diligence in practice is the implementation of a HACCP system. This is a system of food safety control. Essentially the product is traceable from the grower to the consumer. HACCP is a structured and preventative system. It identifies hazards at each step in the process and implements preventative measures.

Traceability through the use of supplier codes or lot markings so that defects and faults can be traced back to source is already an important component of food production and is a legal requirement within the European Union.

To develop a hazard approach there are essentially three stages:

1. To identify the potential hazards in your production
2. To decide which are critical
3. To establish control, documentation and verification procedures for each critical point

The complete process to be assessed starts with growing and pre-harvest of a crop through harvesting, transport, handling, packing and storage to final delivery to the customer. This is normally too long a chain of events to assess as a whole. It is better to restrict the investigation to manageable sections, e.g. growing and pre-harvest up to delivery of product to the packhouse, then a second section to cover receipt of raw materials at the packhouse through to finished product ready for out loading.

The first essential step is to draw up a flow process chart describing the operation in its various stages and at each stage describe the nature of the risk that is likely to occur and allocate a risk reference number. The follow up action sheet is then compiled from the flow process chart with cross reference to the stage of process and risk reference for each.

Critical control points are processes or actions, which if controlled, will eliminate or reduce a hazard to an acceptable level. Hazards may include, biological, chemical or physical properties with the potential to cause harm, such as:

**TABLE: Critical Control Points**

Microbiological	Physical	Chemical
<ul style="list-style-type: none"> <li><input type="checkbox"/> Pathogenic bacteria</li> <li><input type="checkbox"/> Parasites and protozoa</li> <li><input type="checkbox"/> Viruses</li> </ul>	<ul style="list-style-type: none"> <li><input type="checkbox"/> People.</li> <li><input type="checkbox"/> Equipment.</li> <li><input type="checkbox"/> Environment.</li> <li><input type="checkbox"/> Pests.</li> <li><input type="checkbox"/> Natural materials.</li> </ul>	<ul style="list-style-type: none"> <li><input type="checkbox"/> Raw materials.</li> <li><input type="checkbox"/> Process.</li> <li><input type="checkbox"/> Packaging.</li> <li><input type="checkbox"/> Cleaning.</li> </ul>

The farm or company need to estimate the chance that a hazard will occur and whether it is of high concern (a judgement that without control there is a life threatening risk), medium concern (a judgement that there is a threat to the consumer and the threat must be controlled) or low concern (a judgement that there is little threat to the consumer but it may be advantageous to control it). If a risk assessment is not properly

carried out and recorded there can be serious consequences for getting it wrong. Each potential risk is allocated a risk reference number.

Everyone in the chain needs to be aware of the risks and take appropriate action. All along the chain of production and marketing it will be necessary to be able to trace the source of the product, including, production, harvesting, storage, packing, handling, processing, packaging, transport and delivery to the final consumer. Traceability of product through a chain is most common through the use of supplier codes.

Quality assurance procedures should be developed for each stage and accurate, presentable and up to date records maintained. An essential element of any quality assurance system is that records are maintained of all processes and operations. For example, the grower needs to keep pesticide records, the packer needs to keep records of weights and numbers in order to ensure the product meets the specification. Records should always be clearly written, dated and signed by the person entering the data. Regular self-audits will be required to check and ensure that operating standards do not fall below the stated level.

Whatever the range of produce being supplied there must be control systems covering all aspects of production. Product quality control reports at each stage should be prepared on:

- ❑ The product and variety
- ❑ Date of receipt, time of receipt and inspection
- ❑ Source, growers code or name
- ❑ Total consignment and total inspected
- ❑ Weight (or count) of outer and net weight of contents
- ❑ Temperature on receipt
- ❑ Quality and condition of product
- ❑ Decision - accept, reject (give reasons) accept (with proviso for further sorting)

Guidelines will need to be prepared for growers and in area such as ensuring that records are maintained of seed types, treatments, chemical and fertiliser applications. Animals should not be able to access crop growing areas or irrigation water. It should be ensured that irrigation water should be free from any potential contamination through the ground or on the surface.

Any harvesting operation, even if it does not involve field packing, must be controlled, especially, if it involves, hand harvesting of product which receives no further treatment, such as washing, and the product is likely to be consumed in the raw state e.g. strawberries, raspberries, salads, etc. Field toilets with hand washing facilities must be provided where high-risk products are being handled.

Product should be picked into clean containers, preferably washable plastic that provides protection for the product. Where product is picked into the marketing container it is essential to ensure that the empty containers are stored in clean and vermin/pest free premises and that all containers are checked immediately prior to filling to ensure they are clean. Containers, especially cardboard cartons, should not be allowed to become soiled or wet by direct contacts with soil and carriers should be used to prevent this.

Harvested product should be moved from the field into cool, preferably refrigerated conditions as quickly as possible. Detailed post harvest handling conditions should be specified, indicating the product to be cooled to x degrees c within y hours of harvest and maintained to x degrees c up to a point of delivery.

Any sheds or structures used in the field operation should be kept clean and accumulation of rubbish and rejected product must be controlled so that it does not constitute a hazard to the good product as a result of insect or vermin infestation. Benches and tables must be of easily cleanable materials. Any water used in production washing operation must be of potable quality and storage of water must be clean, closed containers.

Guidelines will also have to be prepared in other areas such as the procurement and control of raw materials for processing and packing. A production work sheet will need to be produced and which provides information on the raw material to be used, its source, the quantity to be produced and the essential final product information e.g. weight or count per item, grade, size and labelling information if required. Only raw materials from approved producers must be used and their origins should be traceable throughout the processing chain as far as practicable. Packaging, equipment and materials used throughout the production process must also meet the specifications or requirements laid down by the customer or by legislation. Nets and bags should not be used for products that are easily damaged.

Suppliers of all raw materials, including packaging and equipment must also agree with the conditions of supply listed by the exporter. A raw material specification agreed with the producer must be provided for each product. The raw material specification should include a product description, stating variety and quality standard to be met. The raw material specification should also include the requirements for packaging, which should be clean and clearly marked with suppliers name/code and date of harvest. The raw material specification should be signed and dated on an annual basis by both the supplier and the buyer.

The product delivered should be clean, free from pests and diseases and in fresh condition. It should also be typical of the variety/product type and conform to the weight/size ranges stipulated in the raw material specification. All accepted consignments should be date coded to ensure correct rotation of stock and producer coded to ensure traceability. Product accepted after initial inspection must be held in appropriate storage at the correct temperature for the product and in clean hygienic areas free from risk of contamination. All necessary precautions must be taken to prevent any contamination or deterioration of product after this period.

Adequately lit and equipped facilities for inspection must be available and inspections must be carried out by trained and competent staff. Records of these inspections must be held by the exporter and procedures clearly laid down. Records should be completed by a nominated person at prescribed intervals during production. These need not be a quality controller. Production records can be taken on a time basis e.g. every half hour or on a quantity basis e.g. every 500 packs.

At packhouses there should be no risk of contamination from local industries e.g. smoke or odours from factories. The perimeter and surrounding area must be kept tidy to prevent the build up of vermin, other pests and contamination risks.

Outside doors will need to be fitted correctly, with no gaps and where possible windows and doors should be screened and precautions taken to prevent entry of birds, insects, vermin and domestic animals both within and around the packhouse. Suitable baits should be placed in areas where packaging is stored and checked on a regular basis. Insecticides should be fitted in the packhouse and should be inspected regularly to ensure they are in full working order.

Packhouses used for the production of finished product should be of sound weatherproof construction. It should be ensured that potential breakages of glass or equipment damage will not contaminate the product. All packing and processing must be carried out in clean, hygienic premises. The standard of hygiene required will be related to the degree of risk involved e.g. a product which is eaten uncooked or which undergoes trimming or cutting to make it ready to eat will require higher standards than product which is always cooked prior to consumption.

The layout should be such as to allow the smooth flow of product from the reception of raw material through to preparation and packing into finished product storage and loading areas and to allow adequate separation of raw material from finished product. A minimum requirement will be for all packed materials to be moved to a cold room as soon as possible after packing to lower its temperature to the recommended transit temperature quickly.

It is necessary to ensure that all reject and waste materials are removed quickly and efficiently from the production area. There should be adequate facilities for the removal on a regular (at least daily) basis of waste, surplus product and dirt from the site. The grading and selection area can be the point where the greatest accumulation of dirt, waste and reject material takes place.

The floors must have adequate drainage to allow for easy cleaning and be made of materials that are easily cleaned and sufficiently sound to withstand the normal wear and tear to be expected. Lighting, especially over production lines should be adequate to allow inspection to be carried out effectively.

All equipment should be thoroughly cleaned at the end of each production day. It should be sound and kept in a good state of repair. All hand used equipment such as knives, scissors, secateurs must be of rust proof materials. All equipment used for weighing, sizing, temperature recording or any other measuring device must be checked for accuracy with sufficient frequency to ensure that any malfunction is observed. Routine inspections at least on a monthly basis should be carried out on all production machinery and equipment, to ensure its cleanliness, safety and accuracy. A record of these inspections, together with action lists must be maintained.

Staff facilities should be available and changing rooms provided with lockers for personal belongings, hand washing facilities, toilets and separate areas provided for the consumption of food and drink. All protective clothing should be held in this area and kept in a clean and well maintained condition. Hand washing and toilet facilities should be adequate to meet staff requirements and they should be maintained in a clean, hygienic condition and separated, by at least one door, from the packing area and preferable by two doors.

It is important that all staff are aware of the hazards involved and appreciate the necessity for clean habits, and rigid discipline of hand washing and personal hygiene. Staff suffering from gastric disorders causing sickness, vomiting and/or diarrhoea must not be allowed to work with food products. All sores, cuts and other skin infections must be covered by a blue waterproof dressing. The wearing of perfume or the use of perfumed creams or powders on the hands of staff handling product must be avoided. The wearing of jewellery or other items, which might fall into or be mixed with product is forbidden. Smoking should be strictly prohibited in all areas.

Packaging must be kept in clean, dry and hygienic conditions and, especially it should be thoroughly inspected prior to use to ensure that no insect or other contamination has occurred. The accuracy of information on labels has legal implications. The use of metal staples, wire or non-food grade materials in packaging is not acceptable and all packaging must be kept in a clean, dry storage area free from risk of contamination.

It is recommended that specific record forms are prepared for individual products with major defects likely to be encountered for any one crop to be used as an aide memoire. It is important to record the details of the delivery;

- ❑ Time and date
- ❑ Vehicle number
- ❑ Product temperature and conditions of load e.g. damage
- ❑ Identity of load, growers or packhouses
- ❑ Customer specified if special requirements required

HACCP procedures are normally summarised into a product management manual and which is available for inspection at any time. The product management manual is an essential first step for any business establishing a quality assurance system. It includes background information on the business and its management. In particular;

- ❑ A statement of your the farm or company quality policy. This shows a general commitment to quality and should be consistently promoted to team members and customers
- ❑ The procedures to be followed in order to ensure a consistent quality of product and covering all aspects of the process
- ❑ Management/farm structure and team member responsibilities. Who does what and who reports to whom. A team member structure chart should give an outsider a clear and quick picture of how the farm or business is managed. Clear lines of responsibility must be shown and the chart updated as the farm/business grows and personnel change. A short statement of the responsibilities of each member of management will be required
- ❑ Company information data sheet. A single page format should be available for all customers and others to enable quick and effective communications. It is important to ensure that this sheet is kept up to date
- ❑ Record keeping systems as evidence that the quality system is working effectively

The preparation of a product management manual is the responsibility of the company and will by necessity be tailored to meet the prevailing circumstances. It is not intended to simply meet the needs of existing international quality assurance standards as laid down in ISO or EN guidelines. Rather it introduces and develops the concept and philosophy of total quality management in all operations.

It acts as a guide and will ensure food safety. As a document it is aimed at meeting individual product and customer product specifications, legal requirements of particular countries, as well as being a training manual for staff. For example each member of harvesting staff must be able to pick the product in the right way and at the correct stage of maturity in order to achieve the required quality. Staff will need to ensure that the product is properly maintained at the correct temperature and records kept.

### ***The European Retailer Partnership (EUREP)***

EUREP is a voluntary subscriber organisation established in 1998 and aiming to internationalise the concept of safe and assured agricultural produce and establish a global standard. The steering group comprises of retailers and producers.

The scheme aims to recognise the progress made by agricultural producers in implementing good agricultural practice (GAP) and particularly where used as a means for incorporating integrated pest management (IPM) and Integrated Crop Management (ICM) practices within the framework of commercial agricultural production.

EUREP aims encourage further work to improve growers capability in this areas and to act as a benchmark to assess current practice, and provide guidance for further development. EUREP provides certificates to individual growers or produce marketing organisations (PMO) using objectively verifiable criteria covering traceability and record keeping, seed varieties and rootstocks, site and soil management systems, fertilizer and chemical usage, irrigation, health and safety, post harvest handling, customer feedback/complaints and internal auditing systems.

Certified producers or groups are subjected to announced and unannounced inspections from monitors certified through the scheme.

### ***Global Food Safety Initiative (GFSI)***

The Global Food Safety Initiative (GFSI) was established to attempt to endorse the various numbers of national food safety schemes and standards around the world into one set of criteria or key elements. Compliance with all components of the key elements leading to the endorsement of the standard and subsequent acceptance by buyers. This would enables schemes in different countries to become verified as equivalent to standards that buyers are already aware.

### ***European Norm Standards (EN)***

The EN 45000 series primarily focuses on environmental standards but is expected to become an increasing feature of food industry assurance schemes. Accreditation to the EN 45011 standards is already a requirement for organic and geographically designated foods and farm assured products are set to follow. The standards are expressed as general criteria for certification bodies. It is these bodies which set and agree standards and oversee them. The standards covering the following are most common in food and drink:

45001 The operation of inspection bodies.  
45004 Testing laboratories.  
45011 Product certification.  
45012 Quality management certification.

### **4.3.6 Total quality management**

Continuous improvement is an important component to improving overall product quality, particularly as technical innovation develops. Total quality management is not a standard but rather a management philosophy aimed at ensuring that what should be done, as laid down in the product management manual is in fact implemented.

Total quality management is an approach to quality extending to every activity. It aims to create an environment allowing the complete participation by everyone involved in the process of improving their performance. Quality is no longer perceived as the sole responsibility of a quality control unit monitoring quality at particular stages in the production and marketing chain. Quality now requires every member to participate in achieving customer satisfaction, quality and safety.

Total quality management is a powerful concept demanding commitment, communication and culture change, leadership, member and employee involvement. The potential rewards are improved performance and reduced quality costs. TQM empowers everyone to do everything “right first time” and eliminates crisis management. Use TQM to help everyone to make continuous improvements (however small) in everything they do. Total quality management is an organisational culture that needs:

- ❑ The total commitment of senior management
- ❑ An organisational aim of customer satisfaction
- ❑ Continuous improvements in all products, processes and services
- ❑ The involvement of everyone in the organisation
- ❑ Continuing reductions in the costs involved in improving quality
- ❑ The commitment to quality management by all management and staff.
- ❑ A focus on problem prevention, problem solving and continuous improvements.
- ❑ A documented system that can be easily followed and modified as required.

Training is an important aspect of ensuring the maintenance of satisfactory standards. The involvement and participation of all members within the group and the commitment of management are essential for the successful implementation of the disciplines that are laid down in the product quality development manual.

Total quality managements guiding principles are:

#### ***Leadership***

- ❑ Formulating a vision
- ❑ Communicating and sharing the vision
- ❑ Clear cut and positive in decision making
- ❑ Facilitates and enables change

***Customer satisfaction goal***

- ❑ An appreciation of internal customer and external client needs
- ❑ Satisfying of changing needs
- ❑ Specifications and timescales
- ❑ Maintenance of contacts with customers and clients
- ❑ Follow ups to ensure that customers are satisfied

***Sustainable and continuous improvements***

- ❑ Looking at what competitors are doing
- ❑ Encourage existing and develop new ideas

***Involving everyone***

- ❑ The workforce is viewed as a valuable resource
- ❑ Teamwork is encouraged to meet the organisations objectives
- ❑ Investments are made in developing new talents
- ❑ Investments are made in developing appropriate skills at all levels and to maximise the contribution of each individual to organisational objectives

***Measured improvements***

- ❑ Commercially driven
- ❑ A focus on improvements in customer and client satisfaction
- ❑ All staff are involved and share in the rewards

**4.3.7 Standardisation and other concerns**

Standardisation of production is becoming more important for buyers as the use of standardisation makes it easier for contractual and exchange agreements between buyers and sellers. Increasingly major buyers are requesting minimum facilities, production areas, quantities and specifications as a requirement of supply and have their own regulations.

As international trade has grown, work to harmonise the implementation of marketing standards and to allow free movement of produce, the Food and Agriculture Organisation of the United Nations have attempted to group all standards under the same legal framework (codex alimentarius) to allow better clarity, transparency and co-ordination between different systems and control procedures. However within the European Union strict criteria on the import and export of all fruit and vegetables across national boundaries are enforced and covering areas such as seed and product varieties, quality, size, weight, colour and package sizes. These standards make grading, cleaning and packing particularly important criteria and a quality assurance requirement.

## CASE STUDY

### Tescos

Tesco is the number one food retailer in the United Kingdom and has a food safety philosophy of “never knowingly sourcing or selling food that will cause any physical disorder to customers and complies with the standards set by the company, the Government and any other expert bodies”. In many cases food safety standards go beyond those set out by official organisations.

All foods are tested for micro-biological and chemical standards and the company carry out more than 10 million checks on food annually and more than 2000 suppliers worldwide are visited by trained food and safety quality experts to make sure the food meets the supermarkets requirements. The retailer has strict guidelines for suppliers and carry out regular audits to ensure they are being followed.

Increasingly this includes adherence to HACCP, quality assurance schemes and traceability following agreed procedures and standards for produce identification and documentation. Increasingly this includes a requirement for implementing traceability systems by means of automated data capture, electronic data processing and electronic communications in partnership with growers, packers, importers and exporters and to reduce paper based administration and associated costs and using EAN-UCC standards. This requires all members of the chain to keep records of serial numbers of logistical units (SSCC), identification numbers (GTIN) and information on traded units and location details of their origin (GLN).

The company now are piloting schemes for identification of individual fruit and vegetables and have plans for further supporting the development of radio frequency identifiers.

## EXERCISES

Think of a fruit and vegetable product. Take one component of the production or marketing chain, for example picking or field handling and transport. Consider in detail all the processes involved in this operation and draw them on a chart. Then identify all the potential areas whereby the product may be damaged or contaminated. Reference each risk and say how you would ensure it was minimised and how you would control it.

Draw on a piece of paper the first thing that comes into your head when you think about your organisation. Ask your colleagues and customers do the same. What pictures did they draw? Would they reflect your approach to quality?

On a single piece of paper list all the words you feel reflect your company. For example, honest, reliable etc. Once you have completed the list cut each one out and put them in order of importance. Select the top 5 and draw up your company policy statement around each one.