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FAO
TRAINING
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FOR AGRICULTURAL
MANAGEMENT,
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Cost-effective management tools for ensuring food quality and safety

FOR SMALL AND MEDIUM AGRO-INDUSTRIAL ENTERPRISES

Module 3: Application of quality management principles in small and medium agro-industrial enterprises

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Module 3: Application of quality management principles in small and medium agro-industrial enterprises

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Foreword

The Rural Infrastructure and Agro-Industries Division (AGS) of FAO works to improve and strengthen the capacities of small and medium agro-industries, the enterprises that provide them with services and materials and the relevant support organizations in order to ensure food quality and safety. It carries out these activities using an approach that integrates the different factors affecting the capacity of a business to produce foods to meet the demands of the market according to recognized standards, while maintaining and increasing the profitability and viability of the business. Management and technical aspects must be integrated within a practical and cost-effective approach. This ensures that higher incomes, sources of jobs and the food security of the rural population are also promoted.

The training manual entitled *Cost-effective management tools for ensuring food quality and safety – for small and medium agro-industrial enterprises* focuses on these objectives.

This manual is the result of a collaborative effort by technical staff of the Rural Infrastructure and Agro-Industries Division of FAO. It is based on case studies carried out in Bolivia and El Salvador on opportunities for the improvement of capacity of small- and medium-scale food processing enterprises, through training to meet the demands of the market.

These case studies, which were carried out as part of the FAO programme 'Agribusiness Development: Small and Medium Post-production Enterprises', identified the training needs of small and medium fruit and vegetable agro-industries. This sector had been chosen as representative of the food industries operating in Latin America.

In Bolivia, a range of agro-industries was evaluated. These produced: (i) processed dried fruits, jams and/or fruit pulps, particularly pineapple and peaches; (ii) processed vegetables such as faba beans and garlic; (iii) various processed products such as pickles.

In El Salvador, the study focused on the development of products such as tomato-based foods, fruit juices and nectars (including peaches, apples, grapes and tropical fruits), as well as other fruit and vegetable products. This made it possible to identify problems common to the different enterprises, such as low-quality raw materials, inefficient processing operations, lack of knowledge of the relevant quality and safety standards and their implementation and lack of entrepreneurial vision. There was a consensus among small-scale entrepreneurs that these problems could be overcome by implementing innovative training strategies. This consensus led to the idea of preparing this manual.

The manual is divided into four modules, each subdivided into themes. Module 1 discusses the use of market information as a tool for business decision-making. Module 2 covers systems and tools for improving the management of food quality and safety in agro-industry. Module 3 focuses on the principles of quality

management in small and medium agro-industrial enterprises. Module 4 discusses planning as a tool for the management of food quality and safety.

This manual includes case studies, exercises and bibliographic references, as well as a trainer's guide, PowerPoint presentations, appendices, further reading and links of interest.

The purpose of this manual is to assist trainers and entrepreneurs wishing to use the material for self-learning. With this manual, FAO can now provide the small and medium agro-industry sector in developing countries with an important tool for improving its competitiveness and its capacity to deliver high-quality products to consumers.

The English version has been revised to include references, recommended reading and links suitable for English readers. In Module 2, information on standards and regulations relating to quality and safety has been included in order to provide norms that are relevant worldwide.

Geoffrey C. Mrema
Director
Rural Infrastructure and Agro-Industries Division

Acronyms and abbreviations

Brix	measurement of the amount of sugar in a solution per weight of total solution
GAP	good agricultural practices
GLOBALGAP	pre-farm-gate standard for good agricultural practice (formerly known as EUREPGAP)
GMP	good manufacturing practices
HACCP	hazard analysis and critical control points
ISO 22000	ISO standard on food safety management systems
ISO 9000	family of ISO standards on good quality management practices
ISO 9000:2000 series	ISO 9000 family of standards issued in 2000
ISO 9001	ISO standard providing a set of standardized requirements for a quality management system
ISO 9001:2000	ISO 9001 standard issued in 2000
ISO	International Organization for Standardization
NGO	non-governmental organization
PDCA	planning, doing, checking and acting
SCM	supply chain management
SENA	Colombia's National Training Service
Six 'M's	manpower, materials, machinery, method, medium and measurement

Study guide for the module

APPLICATION OF QUALITY MANAGEMENT PRINCIPLES IN SMALL AND MEDIUM AGRO-INDUSTRIAL ENTERPRISES

Objectives

- To illustrate the importance of quality management principles for improving product quality and safety
- To provide guidelines for the application of quality principles in small and medium agro-industrial enterprises

Content

Theme 1: Principles of quality management in small and medium agro-industrial enterprises

- General quality management principles

Theme 2: Leadership, the key to improving food quality and safety

- Entrepreneurial leadership
- Leadership and planning in agro-industry
- Leadership in communicating of the company's objectives

Theme 3: The process approach and continual improvement – effective tools for food quality and safety management

- Management by process
- The process approach to food quality and safety management
- Continual improvement
- The pathway to improvement

Theme 4: Quality and safety management, starting with suppliers

- Cooperation between actors: the key to quality and safety throughout the supply chain
- Key factors in developing sustainable cooperative relationships
- Strengthening the client/supplier relationship

Activities

Case study Theme 1: A step towards formal quality

- Exercise on Theme 1

Case study Theme 2: Leadership, the key to successful implementation of an HACCP system in an agro-industrial company

- Exercise on Theme 2

Case study Theme 3: The process approach and continual improvement

- Exercise on Theme 3

MODULE 3

Activities	**Case study 1 Theme 4: Experience of contracting in a juice-producing company** **Case study 2 Theme 4: The producers' cooperative Labradores Maya in Guatemala. From Tecpan to Wal-Mart Central America** • Exercise on Theme 4
Assessment	On completion of each theme an exercise is carried out to assess the general understanding of the theme

INTRODUCTION

Quality management refers to the use of planned and systematic actions to ensure that a product or service satisfies quality requirements. In the context of safety management, these actions allow products to be offered in a form that causes no harm to the consumer when prepared and/or consumed in the normal way.

The prerequisite programmes and the hazard analysis and critical control points (HACCP) system involve specific actions for controlling risks to product safety and quality. For example, they incorporate to varying degrees the management of record keeping and the implementation of corrective measures. Standards ISO 9001 and ISO 22000 provide a systematic and integrated presentation of the essential elements needed to demonstrate an organization's commitment to quality and safety.

The requirements of standard ISO 9001:2000 are based on eight quality management principles, which are also considered in standard ISO 22000. Although the specific requirements of quality and safety regulations vary according to the scope of the standard and its objectives, quality principles are of great value when implementing actions to assure quality and safety in the enterprise. This module illustrates basic quality management principles, with special emphasis on four of these principles: (i) leadership, (ii) the process approach, (iii) continual improvement, and (iv) the importance of the client/supplier relationship.

CONTENT

The material is divided into the following four themes.

Theme 1: Principles of quality management in small and medium agro-industrial enterprises

This theme gives a general description of the principles of quality management systems in agro-industrial enterprises as a basis for improving quality and safety management.

Theme 2: Leadership, the key to improving food quality and safety

This theme refers to the importance of (and the elements that define) entrepreneurial leadership as key to improving quality and safety management in an agroindustrial enterprise.

Theme 3: The process approach and continual improvement – effective tools for food quality and safety management

This theme deals briefly with the process approach and its link with the enterprise's improvement strategies.

Theme 4: Quality and safety management, starting with suppliers

This theme focuses on the importance of strengthening relationships with suppliers as a prerequisite for the success of quality and safety programmes and initiatives in agro-industrial enterprises.

ESTIMATED TIME

An estimated 14 hours will be needed to complete this module, including the time required for the training sessions, practical exercises, review of materials and other activities proposed by the participants.

Theme 1: Principles of quality management in small and medium agro-industrial enterprises

INTRODUCTION

Enterprises concerned about the sustainability of their business must recognize the need for continual change in their management strategies in order to adapt to fiercer competition and the globalization of markets for agro-industrial products. Hundreds of businesses and products are launched every day but they do not all achieve a competitive position in the market. Much of the success of enterprises that do succeed stems from the way in which their businesses are managed. Businesses must recognize the importance of a market-led strategy. This entails the use of planning, human resources and knowledge, as well as continual improvement. A series of management models have emerged that incorporate these essential aspects for achieving an enterprise's goals.

The model proposed in standard ISO 9001:2000 is based on eight principles for implementing changes in an organization. The current theme briefly describes these principles as a basis for improving quality and safety management in agro-industrial enterprises.

EXPECTED RESULTS

By the end of this theme, participants are expected to have a better understanding of:

- the importance of the principles governing the implementation or improvement of quality and safety management in agro-industrial enterprises;
- the main strategies that guide entrepreneurial development (impact on the market, the process approach and the need for continual improvement).

SUPPORT MATERIALS

Case study: A step towards formal quality
Reading for Theme 1: General review of the principles of quality and safety management for small and medium agro-industrial enterprises
PowerPoint presentation: Theme 1
Exercise on Theme 1

MODULE 3

Case study

A step towards formal quality

A Colombian company with more than 20 years' experience of marketing exotic fruit in foreign markets decided to take advantage of a government-led incentive programme aimed at encouraging enterprises to implement a quality management system based on standard ISO 9001. The company needed to answer questions such as: Where to begin? and Which activities to develop? A working group was set up to design the process for implementing the standard, which was defined in 10 steps. One of the working group members described the experience.

Step 1: Analysis

Objective: to answer the questions 'What do we have?' and 'What do we need to begin implementing the standard?'

After reviewing and studying the standard, and seeing how it applied to the company, we concluded that we needed to do everything, virtually starting from zero. The analysis covered five main topics:

- **Human resources.** It was necessary to find out more about human resources because this standard is based on complex theory and is not easy to understand. We wanted to examine a series of requirements that would help us to guarantee the quality of the process and the product that we offer to our customers. When we investigated our staff's level of education, we found that it ranged from five years of primary schooling to the first year of high school, which was a very low general level. In addition, we did not have a well-defined organization chart.
- **Needs for training and assessment systems.** These needs were analysed and it was found that staff training was essentially an informal process: the workers arrived, they received a 15-minute brief on what their tasks were, and then they were sent to the plant. There were few assessment mechanisms and control systems. A search was made for manuals, but no written procedures or instructions were found. Records were found in note pads and informal notebooks, but there was no monitoring system. In terms of documentation within the plant, attractive posters concerning some national technical standards were posted on the wall but no one had read them, so the level of knowledge was very low.
- **Maintenance and calibration of equipment**. One of the most important pieces of equipment for any fruit-exporting company is a weighing scale. The frequency of maintenance and calibration of the scales was verified. It was

found that some of them had never been touched; they were simply cleaned and reset to zero.

- **Layout of the facility**. There were some well-defined areas in the plant where the operators placed things – although they were not marked as such. The operators knew which type of fruit to place in each area, but the spatial organization was unclear.
- **Strategic planning**. Lastly, we tried to identify the strategic planning guidelines, especially the vision, mission, objectives and policies relating to quality. No formal information of this type was found. The next stage of the analysis was to define a strategy to help the staff to: (i) understand the standards; (ii) comprehend the concept of quality; (iii) become aware of the process.

Step 2: Awareness

Posters were designed and placed in strategic places throughout the plant. The posters described in simple language the concept of quality and the standards required. Two large wall-to-wall banners were placed in the plant proclaiming: "In this company we work as a team to achieve certification." Teamwork was emphasized because, from that moment on, it really was a team effort. The example of a soccer team was used for teamwork training; a goalkeeper who is not concentrating on the game can obviously affect the final score, or an active forward can score more goals! We had to teach the staff using very simple, concrete examples.

Another strategy used was to stage a staff competition with everyone united around the same objective. The aim was to find a phrase that would identify the certification process. Over a period of two weeks, the workers wrote their ideas in notes and posted them in a box, after which period the ideas were displayed on a poster. This was a totally collective effort that demonstrated the spirit of collaboration. Finally, the winning phrase was chosen: "Quality begins with me." This was adopted as the slogan for the company's certification process.

Another important aspect was the way people integrated throughout the exercise, bringing administration and plant employees together in working groups. Training was given first to administration and technical professionals with a better understanding of the more complex concepts. Lastly, each of the department managers was made responsible for training a group of 10 people.

Step 3: Training

The training consisted of providing a clear explanation of the standards required. Practical examples were used for this, such as: When you go to buy bananas in the supermarket, which do you choose? Do blackened bananas look just as attractive as yellow bananas in a bag? Of course, they replied that the yellow bananas were more attractive because of their better quality. The certification process was explained, which involved obtaining documents, audits, applicability of the standard, etc. One aspect that was difficult for the operators to understand was the organization chart.

The strategy used to resolve this problem was to hold a competition to identify each direct supervisor.

Steps 4 and 5: Information gathering and implementation

The most important stages for the successful implementation of standards are gathering information and writing and designing manuals, procedures, records, technical sheets and plant layout plans. We began with the basic procedures in the plant. The operators were asked: "What do you do, and how do you do it?" The first step was simply to describe what each person was doing. After this, training materials were prepared. For example, employees were asked to describe the function of each piece of equipment, and this information was written down. Record-keeping developed as the procedures advanced. As notes were taken, there was a growing perception that these activities could be controlled. Process control records and technical sheets started to be designed. The strategy was to ask people questions, such as: "When you sort mangoes, how do you do it? Which are the problems that cause you to reject the fruit?" Posters were made for each of the problems found, with photographs so that the staff could see the problem that would lead the fruit being rejected for export markets. Finally, layout plans of the plant were prepared so that the plant's different zones could be identified and delineated. The layout plan was shown to the staff so that they could use it to prevent confusion and misplacing fruit in the stores.

As we did not know how to control our documentation, two office employees were selected for a training course on documentation. They were instructed in all aspects of standard procedures and then given responsibility for ensuring that all the documents were used in compliance with the standard. A consultant was contracted for internal audits. For metrology, office personnel were selected for their training and aptitude for this type of work; in other words, they had to have good mathematical skills. We used certified guidelines and began to develop daily and periodic calibration procedures. Today we have certified scales, which can be used to resolve disputes in the event of complaints from customers.

The topic of traceability caused some problems. When large volumes are handled, lots may become mixed during processing, which makes it difficult to track production to the final customer through the identification of suppliers, packers, sorters, etc. The company decided to send staff members to visit its suppliers and instruct them in quality techniques so that they could guarantee good quality fruit along the entire processing chain.

The plant's different zones were marked out by painting lines on the floor. Signs were posted and formal training programmes were prepared with clear objectives and goals and qualified instructors. Process monitoring was implemented. At the same time, an assessment system was introduced to ensure that all employees were well trained and tested at all times. These assessments and the progress of the operators

were also monitored. Once all documents, procedures, guidelines, manuals and formats were ready, the next step was to disseminate them.

Step 6: Dissemination

This step covers distributing the documents and collecting the signatures of the people who have received them. The personnel involved in the procedures are called to a meeting where they are shown the documentation and informed that it is now an official procedure. It is important for them to sign the documents because, if workers make mistakes that are outside the agreed procedure, the company has the right to claim that they have failed to carry out their duties. This makes it possible to choose personnel with no quality experience because the documents provide them with systematic instructions on the company's quality policies.

Step 7: Implementation

During the implementation stage, checks are made on whether the workers are following procedures, and corrections are made if necessary. All the relevant areas must be checked to ensure that the system is functioning well.

Step 8: Internal quality audits

This crucial test for the internal auditors and the workers is of concern to all the staff involved. The results of internal quality audits are classified as a 'major non-conformity', a 'minor non-conformity' and 'observations'. In the case of a major non-conformity, the procedures must be redesigned because they are not complying with the requirements of the standard. A minor non-conformity is a simple error that has been detected. For example, a record is deleted or it was used wrongly. Observations refer to suggestions made by the auditors to improve the system, such as a specific change that should be implemented.

Step 9: Pre-audit

There is perhaps a greater level of concern for a pre-audit than for an internal audit. An auditor makes a pre-audit and reviews all quality systems. Suggestions are made regarding the improvement of certain components. This is the main reason for audits: to identify errors that can be corrected and to prevent their recurrence.

Step 10: Certification

The final stage is the certification audit. After the pre-audit, problems are identified and corrected, and documents are amended and prepared for the certification audit. If any major non-conformities are found during this external audit, all the work up to this point could be lost. Everyone should be prepared and aware of this before starting the external audit.

The following table shows a comparison of company procedures before and after applying optimal standards.

Before	After
• Information in notebooks	• Information in controlled records
• No areas marked out in the plant	• Areas marked out in the plant for the control of materials in process and for waste materials
• Informal and verbal orders; no procedures	• Procedures controlled and well known
• Scales and balances without any calibration controls or maintenance	• Calibration of scales and balances with periodic maintenance
• No defined training programmes and assessment of personnel	• Personnel trained and assessed on activities critical to quality
• No follow-up of customer complaints	• Customer complaints are filed and followed up with preventive and corrective actions
• Everything done by memory; no documentation	• All procedures are documented; any employee can now be replaced by another at any time

Certification is neither a panacea nor a miracle. The fact that a company is certified does not ensure that it will be successful in the market. However, certification is a tool for competitiveness that opens many doors to international trade for the company. Not only does it facilitate working directly with the human resources involved, it also promotes greater integration and commitment within the company. With all these advantages, everyone in any company can follow the motto 'Quality begins with me'. In the case of the Colombian company described above, the adoption of certification has led to a reduction in customer complaints, greater recognition and higher profits in international markets.

Adapted from *Memorias III Simposio Internacional de Frutas y Hortalizas. Servicio Nacional de Aprendizaje SENA*, Colombia, October 2000.

CRITERIA FOR ANALYSING THE CASE

Analyse the fundamental aspects that support the strategy implemented by the company to satisfy the requirements of the relevant standards and to achieve certification, using the following elements:

- Identify the company's key success factors in achieving certification.
- Identify key aspects of the strategy used to ensure the participation and commitment of the plant personnel.
- List the lessons learned from this case that your company could apply or consider.

The same tasks are listed at the end of the theme so that they can be completed on the basis of the newly acquired knowledge.

Reading for Theme 1

General review of the principles of quality[1] and safety management in small and medium agro-industrial enterprises

INTRODUCTION

The quality management principles are the basis of ISO standards. These standards are aimed at improving the functioning of an enterprise through better internal relationships. This increases consumer or customer satisfaction, thereby building the enterprise's capacity to compete and survive over the long term. When an agro-industrial company decides to implement changes to improve its quality and safety management it must understand that success depends largely on the application of the principles described below.

GENERAL QUALITY MANAGEMENT PRINCIPLES

Principle 1: Entrepreneurial vision aimed at satisfying customer/consumer needs and expectations (importance in the market)

The success of an agro-industrial enterprise depends above all on the acceptance and consumption of its products by consumers and customers. Products can only be sold to people that are prepared to buy them. Therefore the company must understand consumers' needs and be able to anticipate any changes in them. Module 1 provided a clear presentation of the importance of market information – including information about the consumer – as a competitive strategy for agro-industrial companies.

In the area of quality and safety management systems, a customer/consumer focus means that the company must concentrate its resources and time on programmes that ensure compliance with the quality and safety requirements and expectations of consumers and customers in the target market. To do this, the company should implement quality and safety programmes that:

- satisfy the minimum requirements demanded by the authorities or customers in its markets; or
- result in a competitive strategy of differentiating the company in the market by satisfying the expectations of consumers and customers and clients in specific market segments.

[1] For the development of the principles of quality management, specifically for the topics related to the benefits and implications of the application of each principle, the following references have been used: The millenium standards (IRAM 2000) and the Principles of quality (D'Aleman – no date).

For the agro-industrial entrepreneur, the benefits of customer focus include:

- exploiting market opportunities;
- making more effective use of the company's resources;
- boosting consumer satisfaction;
- gaining customer and consumer loyalty;
- achieving permanence in the market;
- improving product quality.

Customer focus generally requires:

- research and understanding of consumer needs and expectations reflected in voluntary and mandatory regulations, as well as in market trends;
- assurance that the company's objectives are linked with consumer needs and expectations;
- communication within the company on consumer needs and expectations;
- measuring consumer satisfaction and taking action based on the results;
- systematic management of customer relations.

Principle 2: Lead entrepreneurs who identify changes and implement strategies to carry them out

Leadership means being capable of establishing a clear vision of the company's future. It involves being interactive, establishing values and ethical models of behaviour, setting a personal example, instilling confidence and understanding, and responding to external changes. Agro-industrial companies benefit from interactive strategies that are implemented by far-sighted managers who anticipate change and do not simply react to it. The example of the asparagus industry is given in Module 2. Leaders are responsible for mobilizing and channelling the company's efforts. They develop a strategic plan based on an understanding of consumer needs and expectations. In addition, they communicate the company's objectives to all employees, thereby ensuring the participation of all actors and their commitment to achieving these objectives.

Application of the leadership principle leads to:

- establishing and communicating a clear vision of the company's future;
- improving communication between all levels in the company;
- translating the company's vision into measurable goals and objectives;
- building the capacity of those involved to contribute to achieving the company's objectives;
- developing trained and informed staff;
- encouraging and recognizing staff contributions to achieving the company's objectives.

Principle 3: Involvement of company personnel in the change process to achieve quality and safety objectives

People are the core asset of any enterprise and their cooperation and participation ensures that their talents and capabilities are fully and effectively utilized for the

company's benefit. Programmes for improving quality will not be successful unless they secure the commitment of the people working in the different links in the chain. The company must therefore:

- improve its workers' skills;
- ensure that workers understand the importance of their contribution and their role in the company;
- create autonomy for problem-solving;
- provide incentives for teamwork;
- establish a shared vision in which everyone identifies themselves with the quality policies and objectives;
- act responsibly;
- provide incentives for actively identifying improvement opportunities;
- provide personnel with the necessary resources, training and freedom to act responsibly;
- encourage teamwork by company employees to meet the needs and demands of the group and to improve their degree of personal satisfaction, as work done with interest and enthusiasm leads to better results;
- promote group work, as this builds individuals' capacity to refine their personal skills and working together as a team leads to better results.

Principle 4: Process approach

Any desired result is achieved most efficiently when the related activities and resources are managed as processes (ISO 9000). A process-based approach allows problems to be identified promptly and resolved rapidly, without the need to improve any processes that are already functioning well. This has positive repercussions on the company's capacity to adapt to demanding and changing markets.

Many quality and safety programmes are based on the process approach. For example, in the HACCP system, quality and safety risks are analysed at each step in a specified process. This creates a need to establish critical points in the process where monitoring and testing of these critical points should be implemented, facilitating the subsequent implementation of corrective measures. The process approach is one of the main tools that the agro-industrial company should use to implement any type of quality and safety management system. It is essential to prepare a chart describing all the company's processes, linking each process to the one that immediately precedes it and the one that immediately follows it in the chain, in order to create awareness of the chain and the responsibility of each of its stages in achieving the desired objectives.

The process approach provides a better understanding of all the company's activities because it defines each of the processes involved. It also details individual responsibilities and facilitates the investigation and review of problems and errors. This leads to the necessary corrective measures.

Benefits

The process approach has the following benefits:

- a clear definition of the company's activities and the relationships between them;
- the responsibilities of process 'owners' in managing key activities are clearly defined;
- predictable results can be obtained;
- the interfaces between company activities and links with suppliers and customers can be observed more clearly;
- results can be measured and assessed for each process independently, and decisions can be taken to improve them;
- human and financial resource requirements, as well as the methods and materials needed to carry out activities, can be determined, and this leads to better resource utilization;
- goals and objectives are defined based on an understanding of the capacity of processes;
- the ability to evaluate and forecast process results and their impact on customers, suppliers, etc.

Principle 5: Apply a system and integrated approach to enterprise management

The system approach relies on identifying and understanding the relationships between the different processes carried out by the company, all of which are fundamental to achieving its objectives effectively and efficiently. The company should take into account the relationships and interdependence between its different processes. For example, there is no justification for investing in improving the quality of an agricultural product if there are no means available for conserving this quality during product handling and processing. Also, if entrepreneurs decide to improve handling practices in their plant to ensure product quality and safety, they will not achieve good results if the raw materials are of poor quality. The entrepreneurial approach means applying management and commercial knowledge during the planning, organization, implementation, management, monitoring, adjustment and assessment phases in order to optimize resource utilization while at the same time generating profits.

The implementation of quality and safety systems at any stage of the product supply chain – from farm to fork – requires an understanding of:

i. the technical changes and adjustments needed;
ii. the way in which these changes affect the company's cost structure;
iii. the way in which resources can be obtained to carry out these changes.

This entails identifying the technical and administrative capacity required, as well as understanding clearly the importance of the participation and contribution of each part of the company. This may mean securing the commitment of staff in all departments to meeting quality and safety objectives. Application of this principle leads to a better understanding of the:

- interdependence of company processes;
- importance of focusing efforts on the most critical processes to achieve the quality and safety objectives;
- responsibilities of each department to achieve common objectives;
- importance of taking into account the company's resources – technical, financial and administrative – before acting;
- causes of problems and the actions to be taken to correct them.

Principle 6: Continual improvement

Agro-industrial enterprises cannot escape technological developments in competitive markets. This year's successful product may not be successful next year because:

- another company may produce the same product at a lower price;
- another company may produce the same product with better quality;
- the product may be imported at a lower price and/or with better quality;
- a new product may appear on the market that has greater consumer acceptance.

A policy of continual improvement is needed in order to stay ahead. According to McGillivray (1998), this policy includes one or more of the following activities.

a. Improvement of the crop and/or entrepreneurial activities with the following goals:

- increasing productivity;
- reducing production costs (or perhaps increasing them if this improves productivity);
- improving and ensuring the quality and safety of products.

b. Improvement of marketing with the following goals:

- improving post-harvest handling;
- implementing a more rigorous sorting process;
- improving the presentation of the product;
- searching for more remunerative buyers/markets;
- searching for new markets (e.g. other geographic areas, or seasons, or a new segment of potential buyers);
- forming associations to offer greater and more consistent volumes and to share the costs of better post-harvest handling and marketing;
- offering new products or new product characteristics that attract buyers;
- thinking about the buyer in terms of:

  - satisfaction
  - quality
  - continuity or commitment to delivery of the agreed quantities
  - change (always improving products)
  - competitiveness (in terms of cost [price], quality and satisfaction)

c. Improvement of the company by analysing the feasibility of:

- producing new products;
- testing new presentations;
- increasing the range of products offered;
- overhauling management and administrative systems;
- introducing new systems for motivating staff.

When should improvement measures be taken?

When a company finds itself in a period of high productivity and profitability, this is the best time to analyse the possibility of initiating changes, improving processes and management or examining new possibilities. This is when the company has the resources to invest in such improvements (McGillivray, 1998). When a company decides to change processes in order to improve quality, this generally means that it will invest in training workers, in improvements to equipment and systems and in continually improving its capacity to face new challenges.

Benefits

Benefits from the application of this principle include:

- better performance resulting from an enhanced organizational capacity;
- capacity to offer better value to the customer at lower cost;
- alignment of the improved activities, at all levels, with the organization's strategic goals;
- flexibility to react rapidly to opportunities.

Principle 7: Factual approach to decision-making: decisions based on data and information analysis

Information is the essential tool – or raw material – for decision-making in the company. A lack of reliable information leads to uninformed decisions, which are often detrimental to the company; for example taking advantage of market opportunities without reliable information, or investing in areas where the critical variables are unknown, may produce unsatisfactory results.

Module 1 of this manual presents an extensive review of the advantages of market information for improving competitiveness and management in agro-industrial enterprises. Decisions and actions taken on the basis of logical analysis, experience and intuition lead to:

- data and information that are accurate and reliable;
- data that are accessible;
- analysis of data and information using valid methods.

Benefits

Benefits of the application of this principle include:

- use of data and information for establishing goals and objectives;
- better understanding of the process and the performance of the system to guide improvements and avoid future problems;

- enhanced ability to demonstrate the effectiveness of decision-making;
- enhanced ability to change decisions based on a review of data and information.

Principle 8: Mutually beneficial supplier relationships

Companies and their suppliers are interdependent. Effective company/supplier relationships create a value added network. The company needs suppliers that it can trust, that know its quality and safety needs and expectations and that can resolve problems in meeting company requirements. Suppliers are therefore vital to the company. The relationship with suppliers is therefore the starting point for quality and safety management. The company/supplier relationship is analysed in Theme 4 of this module. The principle of mutual benefit in company/supplier relationships leads to:

- relationships that produce short- and long-term benefits;
- identifying and selecting trustworthy suppliers with consistent quality products;
- clear and open communications with the supplier;
- sharing information on future projects;
- joint implementation of development projects and improvement activities.

Exercise

COMPLETING THE CASE STUDY

After reviewing the content of this theme and comparing it with your own experience, review your responses to the tasks listed initially and try to identify the principles described in this theme.

APPLYING THE EXERCISE

Carry out the following exercise to improve your understanding of the application of these quality management principles. The company management has decided to implement a programme of best practices to meet its buyers' requirements. Analyse how quality management principles would apply to a good agricultural practices (GAP) programme (if your business is in primary production) or to a good manufacturing practices (GMP) programme (if your business is in packing and/or processing). Use the information provided in Table 1 to complete your answers.

TABLE 1
Summary of the principles of quality and safety management in small and medium agro-industries

Principles	Questions to guide the analysis	Actions/activities that can be carried out
1. Customer focus	Which needs or expectations will be satisfied by the programme?	Interviews with major customers.
2. Leadership	Why is it necessary to apply the leadership principle?	An analysis to identify the person with the qualities to lead the changes in the company for implementing best practices.
3. Involvement of all actors	Which strategies should be implemented to secure the commitment of all employees?	Initial meeting and training of middle-level staff on the system to be implemented. Design a timetable of activities to communicate changes as they are implemented. In drawing up system documents, seek the support of employees involved in each process and activity. Initiate a poster campaign so that all personnel are aware of work requirements and procedures.
4. Process approach	What are the implications of adopting a process approach?	Prepare a map of the company's processes, indicating the strategic processes, the support processes and those dealing with operations.
5. System approach to management	How can the relationship between GAP or GMP programmes and management be established throughout the enterprise?	After producing the map, determine and document how the processes are interrelated and who is responsible for each process.
6. Continual improvement	How can GAP or GMP programmes become a tool for promoting continual improvement in the company?	Carry out an internal audit, at least annually, to identify points for improvement. Prepare at least two action plans for the improvement of two of the audit's findings that are of importance to the company.
7. Factual approach to decision-making	Give examples of how to apply this principle during the implementation of a GAP or GMP programme.	Prepare a summary of products sold and batches rejected for failing to meet customer specifications. Keep up-to-date data on the maximum residue limits for products in the target market. Track the trend in product prices by market, by type of customer and by level of demand in the GAP protocols.
8. Mutually beneficial supplier relationships	How would a GAP or GMP programme mutually benefit suppliers and the company?	Adapt inputs to the company's needs. Prepare quality specifications for packaging in agreement with the supplier. Assess each supplier according to the quality of packaging, price, delivery service and flexibility for delivery outside the programme.

Assessment of the theme

Additional pages can be used to answer these questions.

1. List the eight quality management principles.
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2. What are the benefits of involving staff in the processes of change in the company?
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Think about your own company

1. How would you apply these principles in the context of your own company? According to your business interests, describe in detail which actions you would take, based on each of the eight quality management principles. For this exercise use the example above.
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2. Identify areas where you could improve application of the principles.
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MODULE 3

Summary

- The quality management principles can help enterprises to enhance operations by improving internal relationships that lead to consumer or customer satisfaction.
- When an agro-industrial enterprise decides to implement improvements to quality and safety management, it must take into account the fact that the success of these initiatives is largely dependent on the application of the eight quality management principles.
- Customer focus: the success of an agro-industrial enterprise depends, above all, on the acceptance of its products by consumers and customers. Products can only be sold when someone is prepared to buy them. Therefore the enterprise must know and anticipate the needs of its consumers.
- Leadership: great industrial enterprises benefit from interactive strategies implemented by leaders that can foresee change and not simply react to it.
- Commitment of the company's employees to the process of change: people are the core asset of any enterprise, and their participation and cooperation allows their skills and capacities to be used more fully and effectively for the company's benefit. Programmes for improving quality will not be successful without the commitment of the people involved in the different steps and links in the chain.
- The process approach is used to identify and resolve problems quickly without modifying other processes that are already functioning well. This has positive repercussions for the organization's response capacity, especially in adapting to a changing and demanding market.
- The system approach to management relates to identification and understanding of the relationships between the different company processes. This is essential to achieving the company's objectives efficiently.
- Continual improvement: an agro-industrial enterprise cannot escape technological developments in competitive markets. A product that is successful this year may not be around the following year. In order to keep ahead, entrepreneurs must pursue a policy of continual improvement. Determining which are the most critical processes, and seeking measures to improve them, is a way to consolidate processes, reduce the costs of failure or mistakes and increase efficiency.
- Factual approach to decision-making: information is a fundamental input for decision-making within a company. Lack of information or use of unreliable information leads to uninformed decisions that are often detrimental to the company.

- Mutually beneficial supplier relationships: relationships between the company and its suppliers should be advantageous to both parties in order to establish trustworthy and lasting relationships.

Theme 2: Leadership, the key to improving food quality and safety

INTRODUCTION

Agro-industrial entrepreneurs recognize the increasing importance of quality and safety assurance systems and tools for coping with market challenges and anticipating new trends. However, it is one thing to recognize the importance of such strategies but quite another to make the necessary changes to implement them. The following questions should be asked: Does the company have leaders with the necessary knowledge, motivation and training to initiate the changes required to improve its quality and safety management? Who will generate or create the team environment and the synergy required to deliver these changes?

Leadership is essential for changing current thinking and behaviour and defining strategies within the company, which is crucial to achieving the goals of quality and safety. This theme illustrates the fundamental importance of entrepreneurial leadership for improving safety and quality in agro-industries.

EXPECTED RESULTS

By the end of this theme participants are expected to have a better understanding of:

- the importance of leadership as a key element of change and of quality and safety initiatives;
- the function of leadership in planning and improving quality and safety management in the company.

SUPPORT MATERIALS

Case study: Leadership, the key to successful implementation of an HACCP system in an agro-industrial company
Reading for the theme: The importance of entrepreneurial leadership to the success of quality and safety management programmes
PowerPoint presentation: Theme 2
Exercise on Theme 2

MODULE 3

Case study

Leadership, the key to successful implementation of an HACCP system in an agro-industrial company

Background

A small company processing vegetable pastes (artichokes, mushrooms and olives) has 30 employees. In recent years it has grown significantly after diversifying into new products, which has enabled it to enter more demanding markets. The manager recognized that, to be competitive in this market, the company needed to guarantee the safety of its products. It was therefore decided to implement an HACCP system.

Development

The company implemented the HACCP system with the support of external consultants. The manager made the following comments on this experience. The results of the initial analysis were not very good. We only fulfilled 20 percent of the requirements for good manufacturing practices. The most important observations were: (i) inadequate standards of personal hygiene, cleaning and disinfection; (ii) one part of the infrastructure did not comply with the minimum hygiene requirements; (iii) there was no process control programme. It was decided that the consultants would resolve the problems identified, except for those concerning infrastructure.

Outcome

The consultants explained that the first step towards real change was for someone in the company to assume the role of leader. This person had to communicate freely and directly with the employees, motivate them to achieve the objectives and ensure that the necessary resources were available. Initially these recommendations were not followed. For example, employees had to be sanctioned and given warnings because they failed to comply with GMP and HACCP procedures. This created a volatile atmosphere that led to the resignation of some workers. Those that stayed did not apply the recommendations, or applied them only partially. This led to reflection and changes in attitude. The manager began to participate actively in staff training. He talked with all staff members to explain the company's objectives and plans. In particular, he began to apply the company procedures just like any other worker.

At the same time, the most dynamic employees were identified and work teams were formed. Mechanisms were also put in place to motivate employees, such as contests, birthday parties and prizes for the best workers. This achieved surprising

results: 100 percent application of the procedures by the employees, improved tidiness and cleanliness in company work areas (production, storage and services) and a better working atmosphere.

Source: Munoz, J. 2006. Article entitled *'El liderazgo, Clave del Éxito de la Implementación del Sistema HACCP en la empresa ZEMUSA. Caso Empresa ZEMUSA, Peru'.*

CRITERIA FOR ANALYSING THE CASE

From a business perspective, analyse the key aspects of the strategy implemented by the company to set up the HACCP system. Answer the following questions:

- Which management tools do you believe the company manager used to implement successfully the HACCP system?
- How do these strategies differ from those implemented by the export company in the case described in Theme 1 of this module?
- Which of the lessons learned from this case study could your own company apply or consider?

The same questions are posed at the end of this theme so that they can be answered based on the newly acquired knowledge.

MODULE 3

Reading for development of Theme 2

The importance of entrepreneurial leadership to the success of quality and safety management programmes

INTRODUCTION

What is an entrepreneurial leader?

Generally speaking, an entrepreneur is a person that turns ideas and dreams into reality and builds and manages projects. According to Diaz and Pedraza (2001), these are some of the characteristics that define an entrepreneur:

- demands efficiency and excellence;
- is motivated and transmits this to the staff;
- is persistent in defining objectives and working towards them;
- takes risks based on reliable information;
- works in a team taking into account staff capabilities;
- looks for solutions, planning and defining strategies;
- seeks advice;
- seeks profitability through continual improvement;
- proposes changes and leads their implementation;
- looks for opportunities.

A leader is a person who is able to guide through words and actions, without resorting to sanctions. Leaders are able to combine individual interests and capabilities in a way that contributes to achieving the company's objectives. Figure 1 illustrates the characteristics that define a leader. A fundamental characteristic of agro-industrial entrepreneurs is their capacity to visualize changes and initiate processes of change. The owners or managers of small and medium enterprises are expected to be leaders. They are also responsible for identifying company employees with leadership qualities who will help them to prepare and implement plans and strategies for meeting the defined objectives.

Entrepreneurial leadership

This can be defined as a set of tools for describing the company's vision and mission; disseminating information on the policies and objectives that will guide company activities; planning; taking decisions in consultation with the staff; making continual improvements in all processes; stimulating creativity and initiative and fostering ongoing learning by company staff (Government of Chile, 1999). If we compare company management with driving a car, the objective is to reach the destination, the route is the plan, the car is the company and the driver is the leader.

FIGURE 1
Characteristics of a leader

Enterprise leadership mobilizes and channels the company's efforts by establishing strategic plans based on an understanding of consumer needs and expectations, taking into account the company's resources. It also facilitates communication of the company's objectives to the entire staff, thereby securing the participation and commitment of all actors in achieving these objectives.

Leadership and planning in agro-industry

Planning is a set of decisions concerning the activities that must be undertaken in order to achieve goals and defined objectives (McGillivray, 1998). It is a management tool that allows the company to decide in advance: (i) what should be done; (ii) who should do it and (iii) how it should be done in order to fulfil specific objectives.

For the planning process, entrepreneurs and their teams must understand the internal and external environment of the company and possess the skills to mobilize the technical, administrative and financial resources needed to support the process.

Planning and the hierarchy of objectives

The first step in the planning process is to define the company's goals and objectives. These are defined at different levels. At the very top are the company's mission and vision.

The *mission* refers to the company's general goal in terms of its purpose, values and range of action. *Vision* refers to the company's ideas, which answer the question: How do we see the company in the future? *Policies* are the company's

MODULE 3

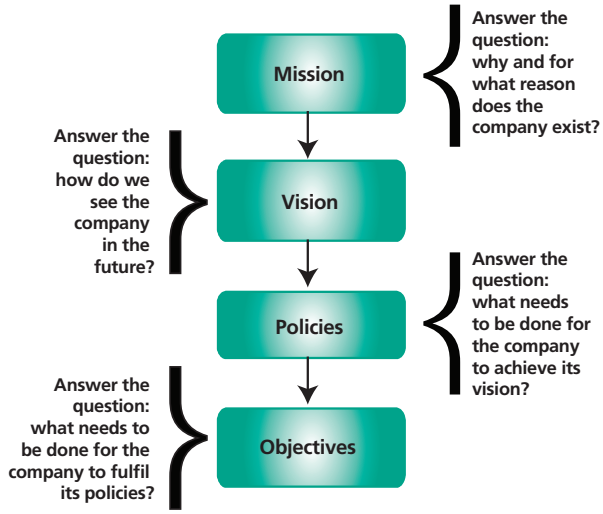
Example of leadership

DELIS is a cheese-producing company in Chorrera, Panama. This small company was processing about 100 litres of milk per day under such difficult conditions that the health authorities were considering closing it down. The company owner's decision to introduce improvements with the support of an international project transformed the company. It is now the top seller in its home city and has maintained constant growth, reaching new markets such as Panama City. In addition to these achievements, this small company has become an attractive place to visit for processors from other parts of the country, as well as from other countries in the region. Students from various universities studying food and nutrition-related disciplines also visit the company to learn about this successful, small-scale experience in enhancing quality and productivity.

Source: *Gestión de la calidad en pequeñas y medianas empresas.* Memoria del proyecto co-patrocinado por OEA y GTZ, 2000.

goals, which answer the question: What must the company do to achieve its vision? *Objectives* answer the question: What must the company do to fulfil its policies? This hierarchy of objectives is presented in Figure 2.

FIGURE 2
Hierarchy of planning objectives in a company



Source: *Políticas de la empresa – ¿para qué sirven? Vásquez 2004*

The company's goals and objectives must be communicated to the staff in such a way that each individual identifies with them and contributes effectively to their achievement. The company's policies and specific objectives must be understood by all employees. All employees should be able to describe in their own words how their jobs contribute to the company's success. This is achieved by a continuing programme of staff awareness training in which the company's policies are explained, together with an outline of how each employee contributes to their achievement and the benefits that this will bring to the company.

Some examples on the definition of mission, vision and policies are provided below.

Example of the hierarchy of a company's objectives

San Jacinto Sugar Company (Peru)

Mission

To supply sugar and sugar products as well as other quality agro-industrial products that are competitive in the national and international market, to preserve the ecosystem and to generate profits for shareholders and welfare for the workers and the community.

Vision

San Jacinto, an ideal place to work and develop as people. A company that is organized, reliable, ethical, innovative, interactive and highly productive, which supplies quality agro-industrial products and services and is committed to the community and the environment.

Policies

The company describes its activities as follows:

- It offers quality products derived from sugar cane and other agro-industrial products and complies with the requirements set by the company to meet its customers' needs and expectations.
- It promotes the development of its workers to enable them to carry out their work effectively and efficiently in a way that encourages their personal development.
- It develops leadership and teamwork in the fulfilment of its objectives.
- It applies continual improvement to its processes and continually improves the effectiveness of its quality management system in order to comply with established requirements.

Source: *Empresa Agroindustrias San Jacinto. Sección-Información Compañía: Misión, Visión y Políticas* (undated)

Management must be fully aware of its role in this process. There is no possibility of success if management does not lead by example and make available the necessary resources (financial investment, materials, infrastructure, etc.). The staff must only pursue polices that reflect the attitudes of management.

The following example shows the importance of defining objectives for pursuing the company's policies.

An example of the relationship between policies and company objectives

Policy on quality

The Department of Food Services and Promotional Articles is committed to providing quality products and services to satisfy client needs and expectations, while achieving efficiency in its processes as well as training staff for continual improvement.

Quality objectives

- Obtain and maintain a total score of 4.0 in the client satisfaction survey.
- Attain 15 percent profitability.
- Attain a total result of 1.5 in the survey on organizational climate.
- Support staff in completing one general training course and one specific training course or skills certification.
- Maintain a quality management system.

Source: *Tecnológico de Monterrey. Dirección de Servicios Alimentarios y Artículos Promocionales (sin fecha).* http://www.mty.itesm.mx/dae/dsa/iso.htm

Importance of defining goals

Defining goals:

- provides a sense of direction;
- focuses efforts;
- guides plans and decisions;
- helps to assess progress.

Points to consider when establishing objectives

The following points should be taken into account when establishing objectives:

- They should be realistic and achievable within a specific time frame.
- All company employees should be aware of how the different areas contribute to the objectives; each area should set its own objectives in such a way that they contribute to the company's general objectives.
- Objectives should be measurable (for example, 'improve' is a desire, not an objective).
- It must be possible to check whether or not an objective is being achieved and, if not, to decide what needs to be done.

Strategic planning versus operational planning

Planning can be carried out at different levels. Strategic plans establish the company's general goals, while operational plans indicate how the strategic plans are implemented in order to achieve the company's policies. (Module 4 describes in more detail the steps to follow in preparing the company's plans.)

Main advantages of planning

The main advantages of planning are that it:

- reduces risk, minimizing the uncertainty surrounding the company;
- identifies the resources needed to achieve the objectives;
- directs the company's employees to carry out activities and take decisions that are in line with the objectives and chosen procedures;
- controls the fulfilment of company objectives;
- sets priorities that focus on the company's strengths.

LEADERSHIP IN COMMUNICATING THE COMPANY'S OBJECTIVES AND SECURING STAFF COMMITMENT

According to Nobel Prize winner, Gary Becker, human capital is the only investment that can generate unlimited yields for exponential growth in enterprises (Fairbanks and Lindsay, 1997). An entrepreneurial leader recognizes the value of human resources in achieving the company's objectives. Therefore, the effective communication of these objectives and the continuing training and motivation of personnel represent a hidden source of growth for companies.

Most quality and safety management programmes include staff training, which is essential for achieving the proposed objectives. Worker motivation also has a direct relationship with the quality and efficiency with which workers carry out their responsibilities.

COMPANY FACTORS THAT PROVIDE MOTIVATION

The company factors that provide motivation are:

The company's objectives, if correctly defined, clearly indicate the responsibilities of employees.

- Assessment of the degree of fulfilment of the objectives, as this provides the necessary feedback to boost the sense of achievement and recognition.
- Participatory management demonstrates that decision-making is shared with staff.
- Allocating clear and concrete responsibilities for employees with regard to the overall process in the workplace, as well as setting up mechanisms for the recognition of good work.
- Internal coordination that favours collaboration rather than control.
- Communication in all directions in order to receive suggestions and proposals for improvement.
- Provision of the means and procedures to perform tasks well (right first time) encourages good work.

- Teamwork encouraged by management (more information on this topic is presented in Appendix 2).
- Confidence of staff in the company's future and being involved in shaping it; this creates a sense of belonging.

An example of motivation: Irurtia Wines (Uruguay)

The bottling plant of Irurtia Wines, a company located in the city of Carmelo, had a problem that was resolved by a motivation system. The machinery that was being used for bottling was imported and was very expensive and costly to maintain. The company had a problem with maintaining and cleaning this machinery. The solution to this problem was to use a financial incentive system. As each machine was operated by one employee, employees were asked to keep their machines as clean and well maintained as possible. A supervisor kept a daily record of the state of each employee's area. At the end of each month, results were compared and the employee with the best performance was awarded a prize.

The company is trying to keep the incentive system going because competition among the employees is fierce and everyone works hard to win the prize; without this, employees could lose motivation. The results have been excellent: the machines are impeccable, the employees make every effort to win the prize, which is added to their salary at the end of the month, and the administration has been freed from the uncertainty associated with having to invest in expensive machinery. The system has one drawback: competition between employees has led to significant rivalries.

Source: Cabrera, T. 2001. *Motivación en las empresas uruguayas.*

Exercise

APPLYING THE EXERCISES

a. After reviewing the content of this theme and comparing it with your own experience, review your answers to the questions posed earlier and try to correct or supplement them. Link your answers to the topics presented in this section, taking into account the case study of this theme.

b. A company that is preparing to launch a new product into the market (precut and packaged lettuce for a supermarket in its local area) wishes to begin implementing a quality management system, and you are a consultant in this field. First of all, define:
   - the mission and vision;
   - the company's policies.

- In addition to the product, take into account the customers, staff, environment, safety and continual improvement. Then define three objectives that will enable you to formulate a strategy for launching the new product.

c. In order to improve your understanding of the content of Theme 2, try to apply the concepts developed in the context of your own company by carrying out the following exercise. Form work teams in your company. Try to assemble teams of people doing the same type of work (e.g. group operators by production line) and carry out the following.
   - Explain the company's mission, vision, policies and objectives (if they are defined).
   - Explain the reason why the working groups have been formed, emphasizing the importance of staff contributions to the company's results. Apply the concepts of staff motivation.
   - Select a person in each group who will be responsible for coordinating the group's work and presenting the results of its work in a plenary meeting.
   - Encourage each group to characterize the work that they carry out, in order to identify problems that occur frequently while they are working. Based on this, each group should establish priority actions and prepare a plan of action that includes suggestions for solving the problems identified.
   - Distribute copies of Table 2 to make it easier for each group to describe the activity.
   - Agree with all the working groups on how long they will work before all the teams come together to present their results.

TABLE 2
Questions to guide the company planning analysis

Question to guide the analysis	Objective of the question	Answer
What is done?	Defining the task	
For what purpose is it done?	Need that is met by the task	
Why is it done?	Objectives	
With what is it done?	Material resources	
Which people?	Human resources	
Who?	The person responsible for the action or process	
When is it done?	At what time	
Where is it done?	Place	
How much time/how many times?	Frequency	
How is it done?	The way in which the activity or process is carried out	
Summary of problems identified		
Priority problems		
Recommended actions		

MODULE 3

Assessment of the theme

Additional pages may be used to answer these questions.

1. Describe the importance of leadership in the management of a company for achieving food quality and safety objectives.
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2. What is entrepreneurial leadership?
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3. What is the relationship between company planning and entrepreneurial leadership?
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4. Define the importance of leadership in achieving employee participation and commitment to the company's quality and safety objectives.
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5. Reflect on how the leadership qualities of some of the company's employees could be used to attain its quality and safety objectives.
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Summary

- A leader is a person who is able to guide through words and actions, without resorting to sanctions. A leader is able to combine individual interests and capabilities in a way that contributes to achieving the company's objectives.
- Entrepreneurial leadership can be defined as a set of tools for describing the company's vision and mission: disseminating the policies and objectives that will guide company activities; planning; taking decisions in consultation with the staff; making continual improvements to all processes; stimulating creativity and initiative and fostering ongoing learning by company staff.
- A company's policies are a set of basic guidelines that show the path the company must follow to realize its vision, together with the objectives that define what the company needs to do to fulfil its policies.
- Planning is a management tool that allows the company to decide in advance what it must do, who must do it and how it should be done to fulfil specific objectives.
- Everyone in the company should understand their responsibilities and what they are authorized to do (authority), as well as the relationship between responsibility and authority. This is of vital importance for employees whose activities may affect food safety and quality.
- Nowadays, continuing training is a prerequisite for a company's survival because it influences its competitiveness and its employees' commitment.
- The best way to exercise leadership in a company is by motivating the staff. It is generally agreed that a person's behaviour depends on their level of motivation. The most important motivation factors are:
  - achievement
  - recognition
  - responsibility
  - specific work tasks
  - personal development
  - belonging

Theme 3: The process approach and continual improvement – effective tools for food quality and safety management

INTRODUCTION

Two decades ago, most leaders of agro-industrial enterprises focused their efforts on correcting and improving their production processes, ignoring the considerable contribution being made by other areas of the enterprise to achieving their objectives. Nowadays, entrepreneurial leaders think in different terms. They no longer focus their efforts exclusively on production processes, as they understand that many other company processes need to be reviewed periodically, then updated or improved, in order to improve efficiency in the company as a whole. These processes are just as important as production processes for maintaining the company's competitiveness.

Markets have created a growing need to adjust business processes in response to market demands. It is now clear that good management, based on a process approach, is an essential component of successful policies and strategies. Similarly, the need for continual improvement in response to the dynamism of markets can be met by restructuring and adapting key strategic business processes.

This theme explores the importance of applying a process approach and seeking continual improvement to quality and safety management in agro-industrial companies.

EXPECTED RESULTS

By the end of this theme participants are expected to be able to:

- understand that an agro-industrial company functions as a network of processes;
- define a process and its components as they relate to improving management quality within the company;
- assess the importance of organizing the company by processes as a complement to organization by functions;
- understand the relationship between continual improvement and sustainable competitiveness;
- identify the steps to follow for integrating continual improvement in the company.

MODULE 3

SUPPORT MATERIALS

Case study: The process approach and continual improvement
Reading for the theme: The importance of the process approach and continual improvement in quality and safety management
PowerPoint presentation: Theme 3
Exercise on Theme 3

Case study

The process approach and continual improvement

Situation 1: Identifying the right solutions

Background

The sales department of a company producing fruit jams and concentrates is responsible for receiving orders and checking the order against the product description and the order specifications. The staff member in charge of this task proposed that the order-checking process should be eliminated. He thought that the salesperson should be responsible for carrying out the order correctly and that there was no need for checking as it represented unnecessary costs for the company. The sales area could then work on other activities during the 15 hours per week usually dedicated to the process of confirming orders.

Development

The company management approved the proposal and decided to adopt it because it meant that the company would reap the following benefits:

- savings in time required to carry out the comparison;
- savings in time and the cost of telephone calls to the salesperson to determine if the number or description was correct;
- savings in time required to review orders as they were entered into the computerized filing system.

Outcome

Evidently this was not the right decision. Although the idea had been to reduce costs, the end results of the measure were disastrous. Two percent of all customers began to receive the wrong products. The night before a trade fair, one client, who had ordered 300 boxes of peach concentrate and 200 boxes of mango concentrate, received only 200 boxes of mango concentrate. The result was an unhappy customer, which damaged the company's reputation.

Source: James Harrington. *Business Process Improvement Workbook* (1993).

Situation 2: Understanding the relationship between business processes

Background

A small company producing fruit concentrates has 20 employees. The company has gradually consolidated its market position and achieved a significant increase in sales in the past few months.

Development

The company began to have problems because it was unable to meet the deadlines set by its customers. The manager conducted a survey to identify which adjustments were needed to make the production process more efficient, enabling the company to increase its productivity. In discussions with the manager, it was agreed that the existing fruit peeling and pulping operations demanded a great deal of time because they were carried out manually. To improve this process, the entrepreneur decided that both the person in charge of weighing raw materials and the operator in charge of quality control would devote several hours of their time to peeling and pulping operations.

Outcome

Although the company managed to increase its production by 1 percent, two weeks after this measure had been implemented, customers complained that the product tasted bitter. The company was forced to recall all its products. Apparently, during the previous two weeks there had been some confusion and, instead of adding citric acid, the employee in charge of inputs to the process had been adding a preservative that looked similar.

Source: Muñoz, J. 2006

Situation 3: Business strategy: seeking opportunities for growth and improvement

Background

About 15 years ago, a Peruvian farmer decided to take advantage of growth in Peru's asparagus exports by cultivating 15 hectares of the crop.

Development of the initiative

At first the farmer's lack of knowledge concerning asparagus production resulted in low productivity and hence low returns on his investment. However, he gradually gained experience and knowledge about the crop and the business. He invested in better quality seed, in modernizing the irrigation system and fertilization regimes suited to the soil conditions and to asparagus requirements. The technical upgrading of his crop production methods greatly increased the yield per hectare (from 6 tonnes to 16 tonnes). At a later date, the producer decided to explore the possibility of forward

integration by exporting directly. A few years ago, the producer benefited from a programme to support the implementation of good agricultural practices and obtained GlobalGAP certification. Today the company produces and exports fresh asparagus in 10 different forms to satisfy customers in the United States market.

The entrepreneur then analysed the possibilities for contracting with suppliers as a strategy for expanding his business. He is also exploring the possibility of participating in an export consortium with two other companies in order to have more negotiating power with buyers. He is also considering the possibility of accessing regional markets in neighbouring countries in order to diversify markets and reduce the risk of dependence on a single market.

Source: adapted by Diaz, L. Personal interviews with producers, Lima, Peru. 2006.

CRITERIA FOR ANALYSING THE CASE

After reading the cases carefully, analyse them as follows:

- Identify differences in the management approach in the three cases described.
- For situations 1 and 2, identify the main factors that led to the wrong decision. Do you think they took into account the relationships between their business processes?
- For situation 3, determine the strategies implemented by the entrepreneur to promote business development.
- From your own experience, identify initiatives that you have undertaken for solving problems or carrying out improvements that have had negative results. Which of these initiatives failed because of a lack of understanding of the relationships between business processes?

The same questions are posed at the end of the theme so that they can be answered using the newly acquired knowledge.

MODULE 3

Reading for development of Theme 3

The importance of the process approach and continual improvement in quality and safety management

MANAGEMENT BY PROCESS

In recent years, management by process has become a very important business tool for quality management. It means organizing and managing the company's activities in a coordinated way, with a view to achieving customer satisfaction and to improving effectiveness and efficiency in the use of resources. When describing the benefits of the process approach, standard ISO 9000 states: "A desired result is achieved more efficiently when activities and related resources are managed as a process" (Figure 3).

WHAT IS A PROCESS?

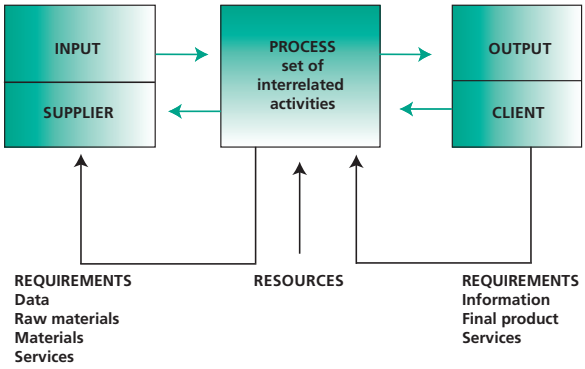
According to standard ISO 9000[2], a process is a set of interrelated or interacting activities, which transforms inputs into outputs. For an agro-industrial company a process is a set of interrelated activities that add value to an input, to obtain a result that satisfies customer requirements.

THE PROCESS APPROACH TO QUALITY AND SAFETY MANAGEMENT

To structure the management of a business using a process approach it is necessary to adopt a horizontal vision of the company's operations, which requires an understanding of the relationships between the various company activities (Figure 4). The process approach entails listing all activities within the company, deciding which of these activities are essential to achieving business objectives (e.g. the supply of raw material) and presenting them as processes. These processes have inputs as well as requirements arising from internal and external clients, regulations and resources. In turn, the processes are transformed, through a series of activities, into outputs or results (either final or intermediate products). The outputs or results are then used as inputs to other processes. In this way, each process is connected to another, and a system is created that reflects an understanding of the network of processes within the company and their interactions (Figure 5).

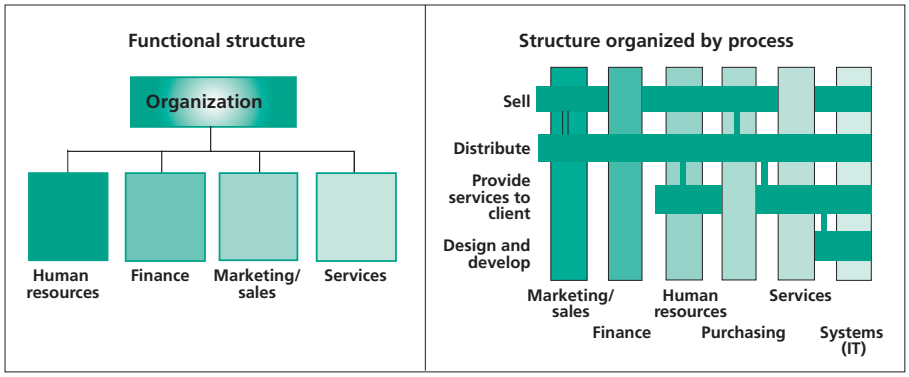
[2] ISO 9000 (2000). International standard certified translation. *Quality Management Systems – Concepts and Vocabulary.*

FIGURE 3
Process approach in a company



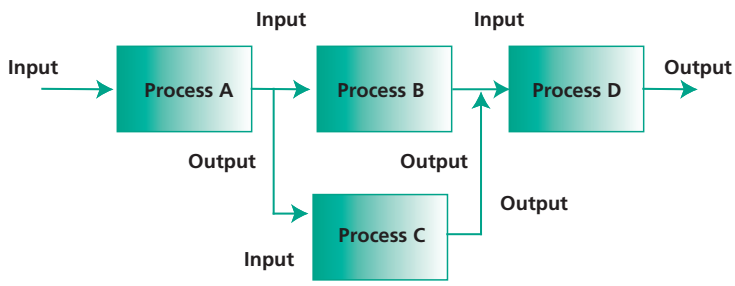
Source: Arrascaeta, R. 2005.

FIGURE 4
Comparison of a functional structure with a structure based on processes



Source: Arrascaeta, R. 2005..

FIGURE 5
Network of processes: processes interact and are interrelated



Source: ISO/TC 176/SC 2/N 544R2®, 2004

CHARACTERISTICS OF A PROCESS APPROACH

These are the characteristics of a process approach:

- Inputs and outputs may be tangible (materials, equipment or components) or intangible (information, energy).
- Outputs may also be waste or contamination.
- Each process has clients or stakeholders that may be internal or external to the company. They define the outputs, or the results required, to meet their needs and expectations.

Types of process

Although there is no defined classification of processes, they can be divided into three groups:

- operational processes related directly to producing a product or service;
- support processes supporting the operational processes, which are generally related to resources or measurement processes;
- strategic or management processes refer to management responsibilities that deal mainly with planning or strategic issues.

MAIN ADVANTAGES OF A PROCESS APPROACH

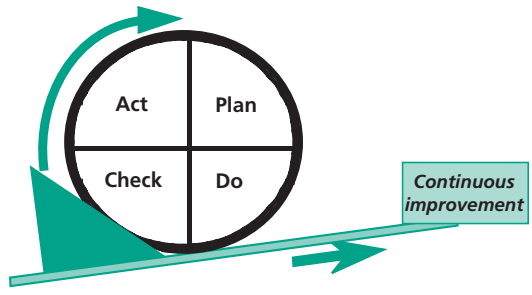
A process approach allows:

- systematic identification of the activities that make up a process;
- identification of relationships with other processes;
- definition of responsibilities for each process;
- analysis and measurement of the capacity and efficiency of the process;
- focusing on resources and methods for improving the process.

Steps for applying a process approach

All processes can be managed according to the planning, doing, checking and acting (PDCA) concept (Figure 6). The PDCA concept is present in all areas of our professional and personal lives and is used continually, either formally

FIGURE 6
The PDCA concept



or informally, consciously or unconsciously, in all our actions. Each activity, no matter how simple or complex, follows this continuing cycle. In the context of an enterprise management system, PDCA is a dynamic cycle that can evolve within each process of the organization, as well as within the system of processes as a whole (ISO, 2001).

Plan
Define goals and objectives and the activities that will contribute to achieving them.

Do
The identified actions are carried out; education and training are provided.

Check
After applying the improvement action, a check is made to see if objectives have been achieved.

Act – replan
If the objectives have been achieved, standardization of the activities becomes an established part of the company's procedures; otherwise an assessment is carried out to identify errors and take appropriate action.[3] Taking the PDCA concept as a basis, the following steps are proposed for implementing a process approach in small and medium agro-industries.

Step 1: Identification of the processes and their sequence

There are three steps to identifying all the processes involved in obtaining the expected results, according to the company's policies and objectives:

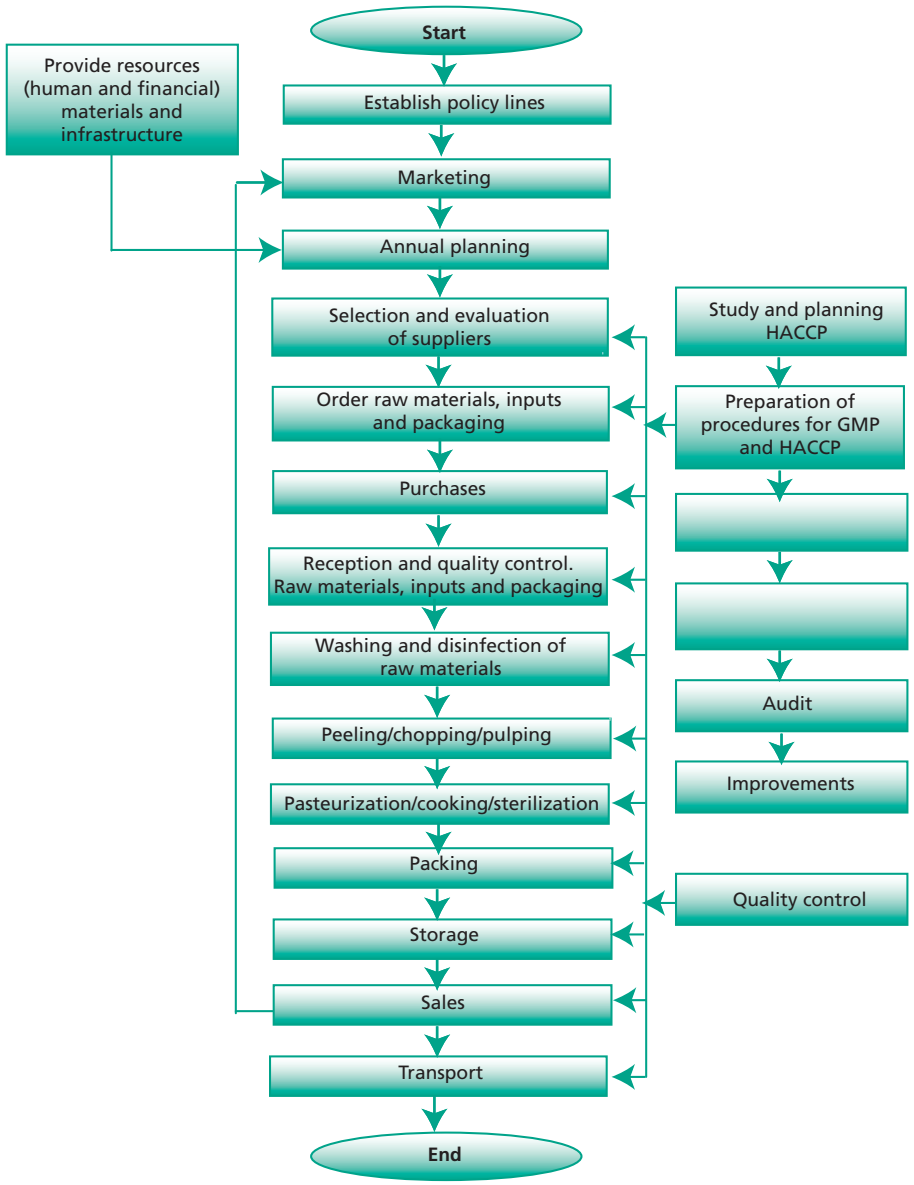
- identification of activities;
- identification and sequencing of processes;
- identification of priority processes.

A. Identification of activities
A flow chart can be used to represent the activities that are carried out in the company and the sequence of activities. The activities must be identified before examining how they function and how they relate to the different steps in the company processes. Figure 7 gives an example of a flow chart for a fruit and vegetable-processing company, from reception and market orders to obtaining the customer's opinion of the product.

[3] This methodology is based on:
- James Harrington. *Business Process Improvement Workbook* (1993)
- *Guidance on the concept and use of the process approach for management systems.* Document/TC. an(r) 13 May 2004. ISO/TC 176/SC 2/N 544R. 2005.

MODULE 3

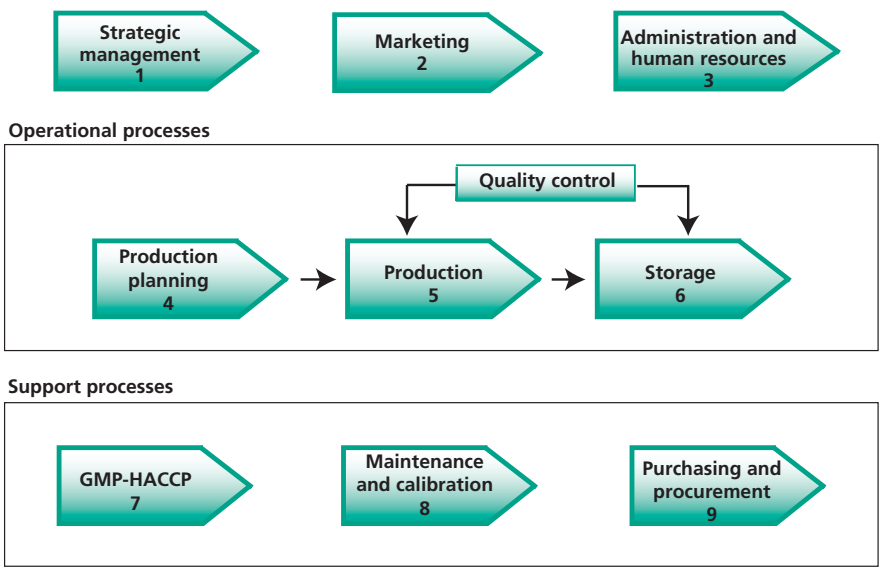
FIGURE 7
Flow chart for a fruit and vegetable processing company



B. Identification and sequencing of processes

After establishing the flow chart of activities, they are grouped into processes. A useful tool for grouping these processes is the process chart. The process chart

FIGURE 8
Process map for a fruit and vegetable processing company



is a graphic representation of the structure of the processes making up a system. Processes are grouped on this chart to identify similarities between processes and to facilitate an understanding of the interrelation and interpretation of the group. Identify and select the most significant processes that form the structure of the system. This is done by analysing the different activities relating to the process and determining how each of these activities influences the results or products.

Figure 8 is an example of a process chart for a fruit and vegetable-processing company. In this case, the processes have been grouped according to their function:

- management or strategic
- operational
- support

C. Identification of priority processes for achieving specific objectives

Determine or define the most important processes for achieving one or more specific objectives. The assessment matrix provides criteria for determining key or priority processes. Appendix 8 gives an example of a methodology used to select priority processes in a company. Although this methodology can be used for any type of company, given the difficulties of small and medium enterprises that are just starting up, we recommend defining the processes using a flow chart.

Step 2: Planning the process monitoring and assessment system

After the processes have been identified, you need to decide: (i) which activities are to be included; (ii) how they are to be implemented; (iii) if the necessary resources are available; (iv) if responsibility has been established; (v) if a performance indicator (or indicators) has been identified and (vi) how efficiency will be assessed. This is called planning.

Planning consists of the following steps:

- definition of activities in each process;
- description of the process;
- identification of the tools for monitoring and assessment, i.e. how performance is to be measured and assessed.

For each process:

- define the inputs and outputs;
- define the activities required to transform the inputs into the desired outputs;
- identify and define the sequence and the interactions between the activities in the process.

Again taking the example of the fruit and vegetable-processing company, Appendix 4 provides specifications for the activities relating to the nine processes set out in Figure 8 above. The description of the processes identifies the objectives fulfilled by each process and defines the instruments that are (or will be) used to monitor the system and assess its efficiency. A simple way to describe the processes is to use a 'process card', which contains the information in Table 3. Appendix 5 gives further examples of process cards and the interaction between processes.

Step 3: Monitoring and assessment of the process

Once the definition of the processes and planning activities, instruments, monitoring and assessment has been finalized, the next step is to implement them.

Monitoring involves the measurement and continuous observation of the process in order to ensure that it is functioning efficiently and according to plan. This is the basis for ascertaining to what degree the desired results are being achieved and where improvements should be targeted. Monitoring controls:

- the capacity of the company, system or process to make a product that meets the requirements (e.g. the production area delivers 90 percent of its products on time);
- the effectiveness of the process (the time it takes to carry out activities and to achieve the planned results);
- whether results conform to the process objective;
- the efficiency of the process (the appropriate use of resources in relation to the result obtained).

Step 4: Improving the process based on monitoring and assessment

This entails analysing the monitoring and assessment data in order to quantify the performance of the process. Once the level of fulfilment of the process

TABLE 3
Components of the process card

Process card: description of the process and the mechanisms for analysing and evaluating its capacity and effectiveness in achieving the company's objectives	
Objective of the process	The objective answers the questions: What is the reason for the process? Why does this process exist?
Indicators	Used for measuring and monitoring the evolution and trends in the process in relation to the objective.
Scope	Establishes the first (start) and the last (end) activity in the process.
Documents and records relating to the process	Provide data on the conformity between the process and the products. Procedures for each activity and monitoring and measurement records are included.
Procedures	The step-by-step description of how each activity in the process is carried out. This makes it possible to obtain a consistent result. For example, when the person in charge is absent, another person can carry out the activity by following these same procedures.
Person in charge	This person is responsible for achieving the objectives, monitoring the process control variables and coordinating with suppliers to ensure the efficient operation of the process.
Resources	Personnel, infrastructure, work environment and other requirements to ensure proper operation of the process.
Inspections	Systematic reviews of the process as a means of control.
Control variables	For identifying where action can be taken to control the process.
Failure conditions	The principal conditions or results that indicate that the process is not meeting the objective.
Interaction with other processes	Identifies the supplier and the inputs for the process, as well as the outputs or the results, and what or who is the client of the process.

requirements has been assessed, the company can focus its efforts on defining corrective measures and on optimizing the processes to achieve the highest possible efficiency. This requires a continual repetition of the PDCA cycle to identify faults or areas for improvement, to plan and implement actions and to check results.

The following section contains guidelines for the continual improvement of quality and safety management in an agro-industrial company.

CONTINUAL IMPROVEMENT

The continual improvement approach can be applied to all types of company process: operational, support, strategic and management. Continual improvement focuses on different objectives: (i) increasing the efficiency of the process; (ii) reducing costs; (iii) reducing defects; (iv) reducing the impact of the process on the environment; (v) reducing waiting times; (vi) increasing customer satisfaction; (vii) reducing the risks of product contamination and deterioration; (viii) making maximum use of staff capacity and (ix) keeping the staff motivated and committed to the company.

It is important to understand that the continual improvement approach deals not only with improving ongoing activities but also with new ways of carrying them out, as well as investigating new processes. This involves examining many changes

where success depends to a large degree on the cooperation and commitment of everyone working in the company.

According to standard ISO 9000:2000, continual improvement is a recurring activity used to increase the capacity to meet requirements. Perez (2003) breaks down this term as follows: (i) 'process' implies a related sequence of actions (steps) and not just a group of ideas; (ii) 'improvements' means that this sequence of actions increases the company's profitability, based on variables appreciated by the market (including quality and service), which give the company an advantage over its competitors and (iii) 'continual' means that, in a competitive environment where rivals attempt to improve their market position, advantages must be constantly developed.

Exercise

HOW IS A CONTINUAL IMPROVEMENT PROJECT STARTED IN A COMPANY?

The pathway to improvement is based on the PDCA concept, details of which are given in Appendix 6. This is a structured sequence for solving problems and defining actions.

COMPLETING THE CASE STUDY

After reviewing the content of the theme and comparing it with your own experience, review your answers to the initial questions and try to correct or supplement them. Link your answers to the topics covered in this section.

APPLYING THE EXERCISES

Complete the following exercises to improve your understanding of Theme 3, and try to apply the concepts developed in the context of your company.

1. Apply the process approach in your company as follows:
   - Identify a process in your company and characterize the inputs and outputs of the process, e.g. the raw materials and support services and the results of the process.
   - Draw a flow chart of the activities involved in the process. For each activity, identify possibilities for improvement.
   - Prepare a process card.
   - Apply the steps of the pathway to improvement. Prepare a proposal to implement the improvement.
2. A company is applying good manufacturing practices to its operations. However, during a three-month period of monitoring two work shifts, it was observed that operators were behaving incorrectly.

The following chart shows the situations encountered, together with their frequency of occurrence. Evaluate the corrective measures that could be implemented to solve these problems. When identifying corrective measures, apply the principles of the pathway to improvement explained in Appendix 6, Figure 1. Describe in detail how you would implement the corrective measures identified to make operators aware of the importance of safety and their contribution to achieving the company's objectives.

Description of the problem	Frequency	Corrective measures
The operators do not cover their hair completely	5	
The operators wear rings and earrings during processing of the product	8	
Operators use the same utensils for raw and cooked products	48	
Operators do not wash their hands after handling soiled material	12	
Operators do not adequately clean their shoes	67	
Operators consume foods in the plant during work time	8	
Operators leave product waste on the tables	3	
Others	2	
Total	153	

MODULE 3

Assessment of the theme

Additional pages may be used to answer these questions and instructions.

1. Applying the process approach in your company, identify the processes, draw them on a process flow chart and illustrate the interrelations between them.…
   ……
   ……

2. If the objective is to improve the quality of your product, how would you identify the key processes?
   ……
   ……

3. Define in your own words the steps required to apply the process approach.
   ……
   ……

4. State three reasons for applying the process approach in your company.
   ……
   ……

5. Describe the relationship between the PDCA cycle and the pathway to improvement.
   ……
   ……

6. Continuous improvement in a company leads to excellence. What are the reasons for this?
   ……
   ……

7. Present data and facts about your company that demonstrate an opportunity for improvement.
   ……
   ……

Summary

- The process approach is a tool that establishes how to manage the company's activities in a coordinated way, improving the satisfaction not only of customers, but also of the owner, employees, suppliers and society as a whole.
- The process approach entails listing all the company's activities, deciding which are key to satisfying customer requirements (quality, safety, functionality, etc.), and representing them as processes that have inputs (requirements by internal and external clients, regulations and resources) and are transformed through a series of activities into outputs or results (final or intermediate products, services). The outputs or results are the used as inputs to other processes. In this way, one process is connected to another to form a system and a network of processes and their interactions can be created and understood.
- The system approach allows:
  - systematic identification of the activities that make up a process;
  - identification of relationships with other processes;
  - definition of responsibilities for each process;
  - analysis and measurement of the capacity and efficiency of the process;
  - focusing of resources and methods for improving the process.
- Continual improvement is a recurring activity to boost the capacity to fulfil specific requirements.
- In the process of continual improvement, the company should focus on understanding the needs of its customers, both internal and external (given that their needs are constantly changing), and implement tools to anticipate these changes and convert them into opportunities for improving competitiveness.
- A constantly applied PDCA cycle is a tool for organizing improvement activities that avoids the need for improvisation and minimizes inconsistencies. The four steps of the PDCA cycle are: planning, doing, checking and acting.
- The pathway to improvement is a technique that uses a structured sequence of seven steps to solve problems and requires a working group to be formed to lead it.

Theme 4: Quality and safety management, starting with suppliers

INTRODUCTION

Globalization and the resulting increase in competition have precipitated various changes in the way agro-industrial companies relate to their suppliers, final customers and other enterprises participating in the business, as well as to their competitors. The process approach and the food chain approach must include suppliers of inputs and services because they are critical to the company's success. One of the eight principles of the system approach to quality management is mutually beneficial supplier relationships. This new form of cooperation and integration of the enterprise with its suppliers, with other companies competing in the same field and with buyers or customers has proven to be a powerful means for gaining a competitive advantage in the global arena.

This theme illustrates the importance of implementing cooperation and coordination mechanisms throughout the product supply chain, from farm to fork. It focuses on supplier/company relationships as a key aspect for improving quality and safety management within agro-industrial enterprises. It also provides a selection of tools and techniques for enhancing the company's commercial relationships with its suppliers to improve the effectiveness of raw material supply processes.

EXPECTED RESULTS

By the end of this theme, participants should have a better understanding of the importance of:

- strengthening relationships between an agro-industrial enterprise and its suppliers as a strategy for assuring the quality and safety of raw materials;
- defining clear criteria for selecting suppliers in order to ensure a supply of raw materials of consistent quality delivered at the appropriate time;
- developing equitable relations between an agro-industrial enterprise and its suppliers, based on mutual benefit, as a strategy for the company's competitiveness and sustainability.

SUPPORT MATERIALS

Case study 1: Experience of contracting in a juice-producing company (vertical coordination)

MODULE 3

Case study 2: The *Labradores Maya* producers' cooperative in Guatemala (horizontal coordination)
Reading for the theme: Quality and safety management, starting with suppliers
PowerPoint presentation: Theme 4

Case study 1

Experience of contracting in a juice-producing company

Background

A company with a long history of fruit juice production began to establish contracts with producers to ensure a supply of excellent quality raw materials. This approach was unusual as there was no commercial production of the required fruit in the area.

Development

The contracts stipulated a fixed price, a compulsory requirement to sell a defined percentage of fruit to the company, quality specifications and, in some cases, included a commitment from the company to provide free technical assistance and inputs to the producers. The company began by concluding individual contracts with 90 producers for the production of blackberries and around 100 producers for passion fruit.

Problems

Nine months after initiating the contract programme, several problems emerged. The company's logistical, technical and administrative capacity was insufficient to cope with 190 contracted producers. Problems with payment delays began to occur and discounts on delivered fruit failed to be processed on time. In addition, technical visits to producers became progressively less frequent because of the extensive production zone. Strong competition from intermediaries led to the collecting centres receiving only 55 percent of the contracted quantities of fruit. As a result of this experience, the company made a series of amendments to its contracts. The new scheme offered contracts with legally constituted producers' associations instead of individual producers. In addition, the company sought support from, and alliances with, institutions that could provide technical assistance in the production zone, as well as with public and private institutions to facilitate producers' access to credit. They also made progress with the technical training of groups and with marketing activities. This enabled the company to spread its risk and receive support from strong institutions in the region. Contracting directly with producers' associations reduced the costs of managing contracts.

Outcome

Today the company handles only produce purchasing contracts. However, the company's current scheme offers producers the opportunity to access information, technical assistance, credit and services through other entities.

Source: adapted from *Contratos y otras formas de concertación en frutas y hortalizas – Manual para multiplicadores*. SENA, 2002

Case study 2

The Labradores Maya producers' cooperative in Guatemala. From Tecpan to Wal-Mart Central America

Labradores Maya is the cooperative responsible for *Del Fresco* products, which are on sale in supermarket chains throughout Guatemala.

Background

Thirteen years ago, Mayan farmers would never have imagined that the products grown by their family would be the most sought-after products in today's market. Operating as a group of 74 partners, they are now one of the leading vegetable suppliers to the Wal-Mart chain of supermarkets in Central America.

Development

Labradores Maya is the cooperative that unites these farmers. According to one of the farmers, their *Del Fresco* is one of the most popular brands, not only in local stores but also in the export market. The small plots in the Chirijuyú district near Tecpan had previously been cultivated by individual farmers, growing chiefly beans and maize. Nowadays, they are one big farm and all produce the same vegetables. However, it took a huge effort for a group of small-scale farmers to reach both national and export markets.

The first major step was to sell to Wal-Mart Central America, which meant that the vegetables had to be certified as safe and free of contamination. One of the farmers commented that it cost a lot of money, but they did it. The second step was to convince the people working with them to change their habits. "It was not easy for them to wash their hands or use the latrines, but nowadays this is normal practice and they do it in their own homes, and it has allowed us to grow," said a farmer with satisfaction. Although they are all small-scale producers, together the 75 partners form a large company. The first order was for 40 boxes of lettuce. At that time this was a large volume and they felt discouraged, but now they deliver up to 500 boxes per week, which has converted them into a solid company.

Outcome

Today they sell vegetables (carrots, cauliflower, lettuce, celery, broccoli and beets) exclusively to Wal-Mart supermarkets in the region. The next step is to sell to the United States of America and Europe. They have an order from Canada to send a container of celery on a weekly basis. Last year, sales totalled 370 000 tonnes. This year's goal is to double that amount. The cooperative has received support from USAID for training producers and monitoring the enterprise's performance.

Source: *El Periodico* – Guatemala. Friday, 18 August 2006

CRITERIA FOR ANALYSING THE CASES

On the basis of your own experience as it relates to this case, reflect on the following topics:

Case 1

- Identify the principal benefits for the company and for the producers of integrating other institutions through contracts and alliances.
- From your own point of view, which factors led to success, in terms of: (i) long-term sustainability and (ii) cooperation between the buying company and its suppliers?

Case 2

- What motivated producers to pool their resources and form the *Labradores Maya* cooperative?
- Identify the principal benefits of this cooperation model for partners that both produce and market their products.

The same questions are posed at the end of this theme so that they can be answered using the newly acquired knowledge.

MODULE 3

Reading for development of Theme 4

Quality and safety management starting with suppliers

INTRODUCTION

Agrifood systems have undergone profound changes in the last decade, partly as a result of increasing demand from consumers and customers for better food quality, safety and traceability. Against this background of deep-seated change, any competitiveness strategy must reject isolation and seek alliances and partners with which to work towards common objectives.

One of the pillars of the strategy of any food company wishing to be competitive in a specific market should be the ability to offer products of consistent quality to meet the buyer's volume and frequency requirements, while causing no harm to the consumer. Similarly, strategies that reduce the uncertainty associated with identifying a market or customers for the company's products are essential for improving the company's competitive position in a specific market. Mechanisms for cooperation between an agro-industrial company and the various actors with which it interacts are key to improving the management of processes that are vital to the company but are not under its direct control.

The development of competitive advantage for small and medium enterprises – specifically for the achievement of quality and safety objectives – is based largely on the company's capacity to develop cooperation networks with its external suppliers, with other companies in the business and with the buyers of its product(s). Normally, small and medium businesses choose their suppliers on the basis of personal relationships, proximity or the ease of obtaining the required inputs.

Most small and medium enterprises rely on a single supplier for any specific input. However, such enterprises have no procedure for selecting and evaluating suppliers of inputs or services critical to the company's business. This can lead to inefficiencies and can affect its product quality and safety. In addition, suppliers that provide inputs or services to the agro-industrial enterprise are likely to have no understanding of quality and to be unaware of the importance of their product or service in the agrifood chain.

Examples abound of agro-industrial enterprises that have had to approach their suppliers to: obtain guarantees concerning the safety of their packaging materials; analyse the composition of fertilizers to ensure that there is no safety risk from heavy metals; ensure the application of good agricultural practices or

good manufacturing practices in the companies supplying raw materials (fruit and vegetables, additives, etc.). In the field of services, major efforts are being made to ensure the quality and safety of agro-industrial products, such as confirming that: (i) the transportation company has hygiene plans and controls for its freight carriers; (ii) the company providing refrigeration services also has a hygiene plan and complies with good manufacturing practices and (iii) personnel are trained to prevent cross-contamination of foods, etc.

In this new approach to quality and safety management, agro-industrial companies must understand the need to work more closely with suppliers, and suppliers must understand that they are part of the chain. Appendix 9 provides further information on the different aspects that an agro-industrial enterprise should consider when purchasing.

WHO AND WHERE ARE SUPPLIERS?

In many cases the number of suppliers has shrunk from a large number to just a few, and sometimes to one single supplier per product, such as suppliers of phytosanitary products, suppliers of paper for wrapping fruit and suppliers of cartons. When a transport service provider is required, there are often no contracts and in some cases it is unclear whether the vehicle involved is used for other purposes, such as for transporting manure or fertilizers.

As Modules 1 and 2 demonstrate, quality means not only complying with specifications, but also meeting the needs and requirements of all customers. In the past, each individual company was responsible for developing quality products but, nowadays, it is a joint commitment involving both the company and its suppliers.

HOW CAN A CULTURE OF PERMANENT RELATIONSHIPS WITH CRITICAL SUPPLIERS BE CREATED?

The first step is to understand the suppliers because they and their customers are responsible for the quality and safety of agro-industrial products. The customer (in this case the entrepreneur) has to specify and document clearly the required characteristics of the product or service. Both parties have to agree on how the product or service will be checked systematically in order to ensure that specifications have been met. It is advisable for the supplier and the customer to be totally independent. When there is a permanent relationship – whether for the supply of fruit and vegetables or for transport – it is best to have a formal contract between the parties. As this is uncommon in the agro-industrial sector, there should at least be a working agreement specifying the parties' obligations and responsibilities. The supplier should also make a commitment to deliver certain data to the customer, such as analytical results on the quality of cartons to be used for packaging fresh fruit and vegetables, or analytical results demonstrating the absence of heavy metals in fertilizers.

MODULE 3

HOW ARE SUPPLIERS SELECTED AND ASSESSED? WHAT IS A RELIABLE SUPPLIER?

A supplier sells inputs to a company, such as raw materials, packaging, phytosanitary products and fertilizers, disinfectants, waxes for fruit, equipment and utensils. A supplier also sells services, such as transport, refrigerated storage, equipment maintenance, cleaning and disinfection.

A reliable supplier is one that delivers a quality product on time at a fair price. Suppliers should not be considered merely as companies that respond to orders. The relationship with suppliers should not end with the delivery of the product or service. On the contrary, suppliers should be considered as an extension of the business or as strategic partners. Every company should therefore conduct a selection process to identify suppliers with which it can develop long-term relationships for the supply of inputs and services. Below is a description of some of the steps that an agro-industrial enterprise could follow to identify strategic suppliers.

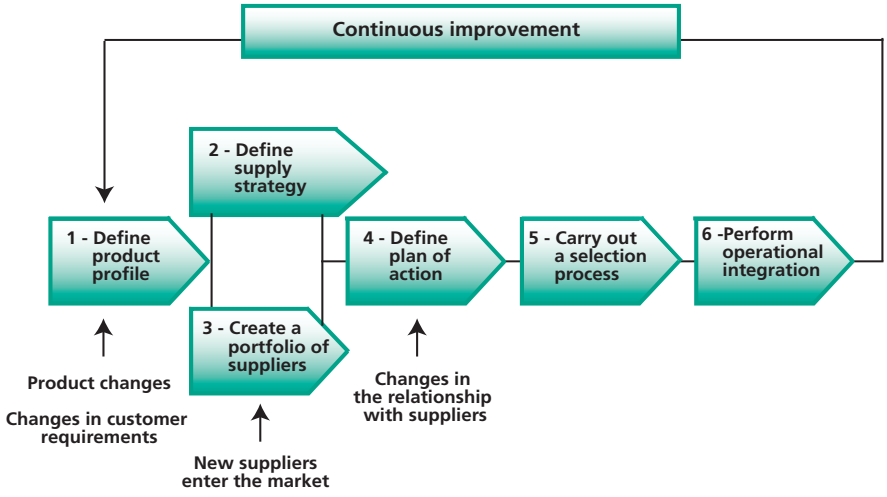
IDENTIFICATION OF POTENTIAL SUPPLIERS

Figure 9 shows the steps that an agro-industrial enterprise should follow for identifying partners and strategic suppliers. The process consists of the six steps outlined below.

Step 1: Define the profile of the product to buy

Before searching for suppliers there must be a clear idea of which products or services are to be acquired or supplied in terms of quality and quantity. This

FIGURE 9
Steps in the identification of suppliers



enables suppliers to be selected on the basis of their ability to provide products of the quality and quantity required by company policy. It is also necessary to identify which products the company buys and which ones are the most critical for achieving its objectives to produce or market safe, good quality products. All the inputs and services needed by the company should be listed, and those that have to enter the selection and assessment process should be determined. It is one thing to select a supplier of paper for administrative use or maintenance services for the company's transport vehicles, but quite another to select and evaluate a fresh-fruit supplier for jam production.

Step 2: Define the supply strategy

Certain elements should be taken into account, such as frequency of purchase, or the existence of a buying programme or documented specifications covering the quality, safety and quality control requirements. For fruit and vegetables, for example, establish if the supply of materials involves:

- written contracts with individual producers;
- verbal agreements with individual producers;
- contracts with producers' associations;
- direct purchase from wholesalers in the market;
- any combination of the above.

Step 3: Create a list of qualified suppliers (portfolio of suppliers)

This entails selecting suppliers that have the potential or experience to satisfy the company's needs and requirements. Enterprises apply different criteria for the preselection of suppliers based on their supply strategies. Continuing with the example of the supply of fruit and vegetables, the criteria could be:

- the size of the cultivated area and potential for expansion;
- location in an area where there are suitable roads transporting the product to the plant;
- producers are organized into associations;
- application of good agricultural practices or certification.

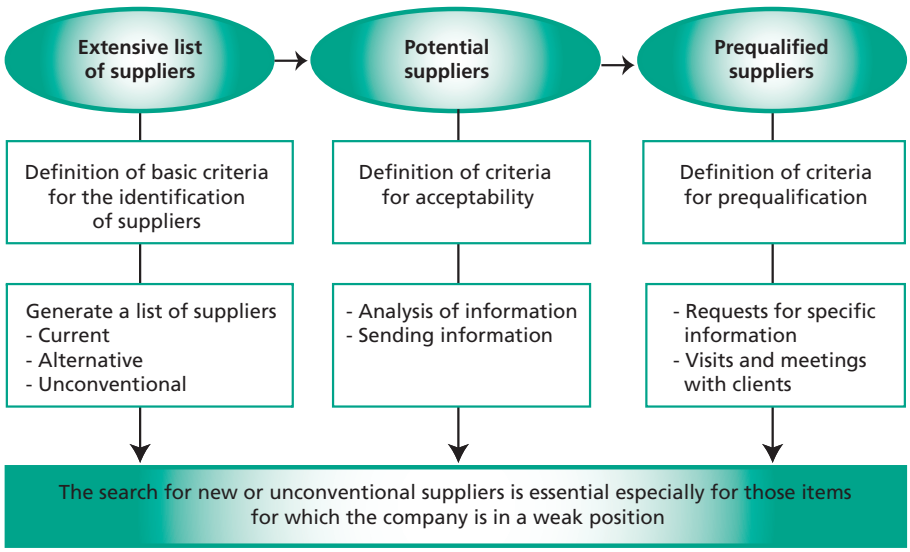
Figure 10 illustrates the process for the prequalification of suppliers. Starting from a long list of suppliers, a shortlist of potential suppliers is produced and, finally, a list of prequalified suppliers is drawn up.

Step 4: Define criteria for the selection of suppliers and strategies for their development

Each company establishes criteria for the process of evaluation and scoring of suppliers. There is no established method. Section 7.4.1 of standard ISO 9000:2000, *Quality management systems*, states that the organization must evaluate and select suppliers based on their ability to supply products that meet the requirements of the organization. Criteria should be established for selection, evaluation and re-evaluation. Records should be kept of the results of assessments and of whatever action was taken as a result.

MODULE 3

FIGURE 10
Prequalification of suppliers



Supplier assessment is used to eliminate suppliers that do not meet the company's needs and expectations, as well as to motivate those that work with the company to achieve its quality and safety objectives. The criteria for the selection of suppliers include:

- **Strategic:** location, experience, availability, quality programmes, image, fulfilment and recordkeeping.
- **Technical**: infrastructure, staff training, vehicles, quality and safety of their products, technical assistance.
- **Commercial**: communication with the company, price, discussion of problems, attention to requirements, flexibility on deliveries, forms of payment.

Once the criteria for assessment and scoring have been established, a table is prepared to assess how well each supplier satisfies the established criteria. The opinions of the employees involved in placing orders, reception, use and storage of the inputs, as well as the opinions of the direct users of the service, are taken into account. For example, if cartons are to be used for packing fruit, the manager in charge of purchasing will give an opinion on how speedily the supplier deals with budgets or agrees on deliveries, and the plant manager will score the quality of the product (e.g. whether it breaks or tears during use and whether the printing

complies with the order). The manager in charge of shipping the final product could give an opinion on the quality of the packaging when observing the complete pallet. Making use of staff knowledge and experience is crucial to the selection and assessment process. Appendix 10 details reasons, benefits and steps to follow in establishing cooperation between actors.

Step 5: Selection of suppliers

In this step, the score for each supplier is determined according to the answers obtained and the score assigned to each answer. Suppliers are grouped into categories for defining and validating their fulfilment of the company criteria for supplier selection. This also identifies the strategies needed to assist suppliers in resolving critical quality and safety problems. These include the provision of training and technical visits to the company, as well as visits by technical staff in the field and the programming of technical inspections. Appendix 11 provides more detailed information on systems for the confirmation of suppliers.

Step 6: Establish operational integration between the client and a supplier

Finally, suppliers that have been evaluated and selected are included in a list of approved suppliers that will provide inputs and services to the company. These are the suppliers with which it is desirable to work in implementing the strategies for continual improvement.

To facilitate the assessment task, two examples of supplier criteria, scoring and final qualification are presented below. A card should be prepared for each critical supplier (Table 4). The first format can be used by companies that are already working with management systems and/or have personnel for carrying out this task. The second format is more basic and is suitable for small companies with little or no experience of this process. In small companies that are just starting up, a simplified assessment is adequate. This takes into account the quality of the product or service, the price, the delivery service, complaints and attention (Table 5).

Step 7: Re-assessment of suppliers

Companies are increasingly adopting the practice of re-evaluating suppliers. This involves frequent evaluation of their performance to check that suppliers are maintaining their ratings and, if this is not the case, to identify where improvements are required. Re-assessment reports should be communicated to suppliers in a clear and coherent way so that they can take action to correct any problems. Re-assessment of suppliers is typically carried out on an annual basis but may be more frequent. The frequency and the methods used depend on the type of input or service involved and its importance to the customer.

TABLE 4
Example of criteria used by a company to assess its suppliers

	EVALUATION CARD BY SUPPLIER						
ASPECTS	Name of supplier:						
	CRITERIA	SCALE 1= unsatisfactory 5= very satisfactory					SCORE
		1	2	3	4	5	
STRATEGIC	Experience						
	Availability						
	Quality						
	Image						
	Improvements						
TECHNICAL	Infrastructure						
	Personnel						
	Equipment						
	Operations						
COMMERCIAL	Customer service, compliance with delivery times						
	Communication with the customer						
	Planning						
	Price						
	Response to complaints						
	TOTAL						

EVALUATION CRITERIA	
Concept to evaluate	**How**
Product or service quality	Quality below market level: 1 Quality at market level: 3 Quality above market level: 5
Price	Price above market: 1 Price at market level: 3 Price below market: 5
Readiness to find solutions	Does not find solutions: 1 Finds solutions: 3 Finds many solutions: 5
Compliance with delivery deadlines	Delivers late: 1 Variable – Delivers 1 out of 10 late: 3 Always on time: 5
Response to complaints	Does not resolve complaints: 1 Resolves complaints but outside deadline: 3 Resolves on time and correctly or there are no complaints: 5
Quantity of complaints	Many (5 to 10):1 Few (less than 5): 3 None: 5
Planning	Incorrect planning (time and form): 1 Correct but some mistakes (time and form): 3 Very satisfactory (time and form): 5

SCORE	EVALUATION	FOLLOW-UP ACTION
60 – 70	Very reliable	Acceptable-review weak points
40 – 60	Conditional	Work on an improvement plan
Less than 40	Not reliable	Not acceptable

TABLE 5

An example of assessment of suppliers in a small company without experience in supplier development

	EVALUATION CARD BY SUPPLIER		
Criteria	Evaluation	Score	Total
Quality			
Price			
Service			
Attention			
Evaluation score			

Exercise

COMPLETING THE CASE STUDY

After reviewing the content of the theme and comparing it with your own experience, review your answers to the initial questions and try to correct or supplement them. Link your answers to the topics covered in this section.

APPLYING THE EXERCISE

Apply the knowledge you have acquired on the selection and assessment of suppliers to the processes in your company by carrying out the following steps:

1. List all the inputs purchased by your company.
2. Prioritize those that are of most interest for the quality and safety of your product, and include services.
3. Prepare a table using criteria that you would use for selecting and evaluating your suppliers.
4. Indicate in which way this information is valuable for your company's purchasing operations and for producing safe, quality products

To improve your understanding of the content of this theme and to evaluate its practical application, we suggest that you carry out the following exercise on the assessment and selection of suppliers. The exercise can be carried out in groups or individually.

1. Read carefully the situation described above.
2. Choose the two transport companies that you consider to be the most suitable, taking into account the information provided in Table 6.

Description of the situation

A food company needs to subcontract its transport services; this is a critical aspect for customer satisfaction. The company dispatches products nationwide, as follows:

Zone	Percentage of orders
South	40
North	30
Centre	30

The management proposes to choose two suppliers. Descriptions of three potential suppliers are given in Table 6, together with details of the bids they presented. They all offer the same transport tariffs. For the company it is essential that there should be no delays or hold-ups in delivery services.

3. Prepare a matrix for the assessment of suppliers. Define the assessment criteria and assign a score to each criterion explaining your reasons.
4. Share the results of your analysis and your decision in the plenary session.

TABLE 6
Summary of potential suppliers

Topic	Candidate 1	Candidate 2	Candidate 3
Experience as a supplier	8 years	6 years with the company	2 years with the company
Vehicles	50% of operations are subcontracted	80% transport equipment is owned; 20 percent is subcontracted	70% of operations are subcontracted
Quality management systems	No known model of support	No known model of support	ISO 9001:2000
Staff training	Defensive driving (drivers) Customer service	Defensive driving (drivers) Customer service	All staff trained Subcontracted personnel given 20-minute briefing before each dispatch
Performance	98% in 2004 96% in 2003	95%	92% in 2004 82% in 2003
Attention to complaints for non-delivery	Attention to all complaints	Some complaints have not been dealt with (deterioration). Complaints for non-delivery have all been dealt with	All complaints for non-delivery and deterioration have been dealt with
Delivery delays	18% of all deliveries for vehicle problems 4% for other reasons	12% for vehicle problems 4% for other reasons	No delays
Ease of communication	Telephone contact	Manager visited the enterprise to learn of needs and perceptions	Driver hands out a survey to each customer to evaluate their service on each dispatch
Location	120 km from the company's headquarters	5 km from the company's headquarters	10 km from the company's headquarters

Assessment of the theme

Additional pages may be used to answer these questions and directions.

1. Why is it important for companies to recognize that their suppliers are strategic partners?
   .....
   .....
   .....
   .....

2. Do you consider yourself a partner or a strategic supplier? Explain your answer.
   .....
   .....
   .....
   .....

3. List the actions your company undertakes to strengthen and improve relations with its suppliers.
   .....
   .....
   .....
   .....

4. Identify five criteria that are essential in the evaluation of suppliers.
   .....
   .....
   .....
   .....

5. How do you think the current evaluation system for suppliers could be improved in your company?
   .....
   .....
   .....
   .....

MODULE 3

Summary

- Mechanisms for cooperation between an agro-industrial enterprise and the various actors with which it interacts are key to improving the management of processes that are vital to the company but are not under its direct control.
- The development of competitive advantage for small and medium enterprises, especially for improving quality and safety, is based largely on the company's capacity to generate cooperation networks. These should be developed with its suppliers, with other enterprises in the business and with buyers of its products.
- The new process approach to quality improvement means that buyers must work very closely with their suppliers to identify the main factors that prevent compliance with quality requirements. It also means supporting suppliers in implementing measures for preventing and controlling possible causes of deterioration in product quality and safety, starting in the field.
- Suppliers should consider themselves as an extension of the company and as strategic partners. The company must develop processes that allow it to identify suppliers with which it could develop long-term relationships for the supply of raw materials.
- Quality control at reception is one of the most important steps in quality management within a company. To a great extent, the quality of raw materials determines the quality of the final product. Quality control requires planning, research, administration and discipline, together with regular training and the revision of procedures.
- The supplier identification process consists of the following steps:
  - define the profile of the product to buy;
  - define the supply strategy;
  - create a list or portfolio of qualified suppliers;
  - define criteria for the selection of suppliers and strategies for their development;
  - carry out a systematic process of supplier selection;
  - encourage the operational integration of the client and the supplier.

References

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SENA. 2002. *Contratos y otras formas de concertación en frutas y hortalizas. Manual de capacitación.* Servicio Nacional de Aprendizaje (SENA). Armenia, Colombia.

THEME 2

Cabrera, T. 2001. *Motivación en las empresas uruguayas.* Article available in Spanish at www.gestiopolis.com/recursos/documentos/fulldocs/rrhh/moturu.htm

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Fairbanks, M. & Lindsay, S. 1997. *Arando en el mar. Fuentes ocultas de la creación de riqueza en los países en desarrollo.* Ed. McGraw-Hill. Colombia, 2000.

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Muñoz, J. 2006. *El liderazgo, clave del éxito de la implementación del sistema. HACCP en la empresa ZEMUSA*. Peru 2006.

OEA-GTZ. 2000. OEA–GTZ Project – *Gestión de la calidad en pequeñas y medianas empresas. Un ejemplo de liderazgo: la empresa DELIS de quesos de la Ciudad de Chorrera*. Panamá.

Links and complementary documents

LINKS OF INTEREST

Recommended Links

http://gaif08-blog.mediavince.com/?lg=en&topicId=15
http://www.qlif.org/
http://www.iso.org/iso/iso_catalogue/management_standards/iso_9000_iso_14000/more_resources_9000/9001supchain.htm
http://isotc.iso.org/livelink/livelink/fetch/2000/2122/687806/ISO_TC_176__Quality_management_and_quality_assurance_. pdf?nodeid=852656&vernum=0
http://isotc.iso.org/livelink/livelink/fetch/2000/2122/138402/755901/1069636/customview.html?func=ll&objId=1069636&objAction=browse&sort=name

DOCUMENTS OF INTEREST

Theme 3

ISO. 2000. ISO 9000 International standard certified translation. *Quality management systems. Concepts and vocabulary – principles of quality.* ISO 2000.

ISO. 2001. *Guidance on the process approach to quality management systems.* Document: ISO/TC 176/SC 2/N 544R. May 2001.

ISO. 2004. *Introduction and support ISO 9000: Guide on the concept and use of the process approach for management systems*. Document: ISO/TC 176/SC 2/N 544R2(r). 13 May 2004.

Tetsuichi, A. & Ozeki, K. 1990. *Handbook of quality tools: the Japanese approach.* Ed. Cambridge Mass Productivity Press.

Appendix 1

Recommended further reading on the themes of Module 3

THEME 1: PRINCIPLES OF QUALITY MANAGEMENT IN SMALL AND MEDIUM AGRO-INDUSTRIAL ENTERPRISES

Reading 1: Revolution and evolution

Author: Alderete, J.M. & Fuxman, A.
Published by: *Secretaría de Agricultura, Ganadería, Pesca y Alimentos – Minesterio di Economía e Producción, República Argentina.*
Document:
http://www.alimentosargentinos.gov.ar/0-3/revistas/r_35_especial/articulos/revolucion_evolucion_ingles.htm

Description
The promotion and improvement of agrifood quality has been one of the functions of the National Food Administration since its creation. Although actions aimed at this objective began more than 10 years ago, the birth of the 'Argentine Food Quality' Programme (PROCAL), coordinated by the Under-secretariat of Agricultural Policy and Food in 2001, marked the beginning of a period that widened and deepened the scope of this programme.

THEME 2: LEADERSHIP, THE KEY TO IMPROVING FOOD QUALITY AND SAFETY

THEME 3: THE PROCESS APPROACH AND CONTINUAL IMPROVEMENT – EFFECTIVE TOOLS FOR FOOD QUALITY AND SAFETY MANAGEMENT

Reading 1: Guidance on the process approach to quality management systems

Published by: International Standards Organization (ISO)
Document:
ISO/TC 176/SC 2/N 544 R., May 2001.

Reading 2: How to implement a food safety management system

Author: Frost, R.
Published by: International Standards for Business, Government and Society. ISO 2006.
Document:
http://www.iso.org/iso/food_safety_frost.pdf

MODULE 3

Description
This document describes the application of the various quality standards published by ISO and refers to various documents that help organizations to apply these norms.

Reading 3: A new process-based approach for implementing an integrated management system: quality, security, environment

Authors: Badreddine, A., Ben Romdhane, T. & Ben Amor, N.
Published by: International MultiConference of Engineers and Computer Scientists 2009 Vol II IMECS 2009.

Description
This paper presents a new approach to implementing and integrating quality, environment and security management systems on the basis of three aspects: a process-based approach, risk management and a global monitoring system used as integrating factors to satisfy three important levels of integration – correspondence, coordination and integration.

Reading 4: The quarterly quality report

Author: American Society for Quality, 2007.
Published by: American Society for Quality, 2007.
Document:
http://www.asq.org/quality-report/reports/200706.html

Description
The ASQ Quality Report provides a detailed look at a variety of quality-related topics and issues. The report is developed by the American Society for Quality in keeping with its role as the steward of the quality profession to promote the use of quality as a global priority, an organizational imperative and a personal ethic, and to promote quality concepts, technology and tools.

Reading 5: Productivity – theory and measurement in business

Author: Saari, Seppo.
Published by: Management Information Development Oy. 2006.
Document:
http://www.mido.fi/index_tiedostot/Productivity_EPC2006_Saari.pdf

Description
This paper is based on the book with the same title.

Reading 6: Guidelines on the process-based approach for quality management systems

Published by: International Standards Organization (ISO).
Document: ISO/TC 176/SC 2/N 544 R. May, 2001.

Description
This document provides a better understanding of the concept and the intentions of a process-based approach for quality management systems.

THEME 4 – QUALITY AND SAFETY MANAGEMENT STARTING WITH SUPPLIERS

Reading 1 – Business partnerships in agrifood chains

Authors: Piñones Vázquez, S., Acosta Avila, L.A. & Tartanac, F. FAO Regional Office for Latin America and the Caribbean.
Published by: FAO, 2006.
Document:
http://www.fao.org/ag/ags/programmes/en/agribusiness/Business.pdf

Description
This document helps to consolidate business partnerships in agrifood chains in the region by analysing the results of project TCP/RLA/2905 *Support for the promotion and development of business partnerships*, implemented in Brazil, Chile, Mexico and Peru in the milk, castor bean, beef, avocado, lemon, mango, artichoke and lentil chains.

Reading 2: The food safety revolution

Author: Percy, B.
Published by: Food Quality, 2009.
Document:
http://http://www.foodquality.com/details/article/807865/The_Food_Safety_Revolution.html

Description
This article describes how a food safety management system can help the food industry comply with new safety initiatives.

Reading 3: Linking farmers to markets

Author: Rural Infrastructure and Agro-Industries Division of FAO.
Published by: FAO, 2007.
Web site:
http://www.fao.org/ag/ags/subjects/en/agmarket/linkages/coops.html

Description
On this Web site, nine case studies are presented under this category. Three (Argentina, Costa Rica and Guatemala) involve cooperatives that have developed agribusiness ventures with only limited external assistance. Other cooperative ventures (in Brazil, Guatemala, El Salvador, Haiti and two cases in Ghana) have benefited to a greater or lesser extent from external assistance by governments, donors or NGOs.

Reading 3: Establishing supply chain partnerships: lessons from Australian agribusiness

Author: O'Keeffe, M.
Published by: Supply Chain Management: An International Journal, 1998.
Document:
http://www.emeraldinsight.com/Insight/viewContentItem.do?contentType=Article&contentId=858142

Description
Many agribusiness firms in Australia are buying into the concept of SCM but are not sure how to apply it. This article provides some guidance for firms that are considering following the SCM path. It presents a checklist for auditing potential supply chain partners, which has proved useful in focusing the minds of potential partners on the key issues of trust and relationship management.

Reading 4: Safety in the agri-food chain

Author: Luning, P.A., Devlieghere, F. & Verhé, R.
Published by: Wageningen Academic Publishers, 2006.
Document:
http://books.google.it/books?q=safety+in+the+agri-food+chain

Description
Increasing public demand for an adequate and safe food supply has led to extensive development in the field of plant and animal production, food processing, quality and safety procedures, food analysis and control and regulations. However, food safety can only be guaranteed by the integration of control systems throughout the food chain 'from stable to table'. This book covers the entire agrifood chain.

Reading 5: Agri-supply chain management

Author: Timmermans, T.
Published by: Wageningen UR, 2006.
Document:
http://www.unapcaem.org/Activities%20Files/A22/021_keynote.pdf

Description
PowerPoint presentation on Enhancing Export Competitiveness of Asian Fruits.

Appendix 2

The importance of teamwork in achieving company objectives

WHAT IS TEAMWORK?

Teamwork is defined as work carried out by a small number of people with complementary skills who are committed to the same objective, common planning and shared responsibility. The combined experience and talent of all the people working in a team is greater than the experience and talent that any one of them possesses individually; there is synergy.

DIFFERENCE BETWEEN A TEAM AND A GROUP

- A group is a collection of people with a common characteristic, for example, work companions or members of a club.
- A team is a group of people with a common mission or objective who work in a coordinated way, with the participation of all under the direction of a single leader; for example, a team of operators in a production line, or an improvement team.

BASIC RULES FOR A PROPERLY FUNCTIONING TEAM

- avoid competition between members of the team
- avoid manipulation
- know how to listen
- avoid taking a defensive position
- make sure that everyone participates
- synchronize everyone's activities while they participate in a given action

REQUIREMENTS FOR THE FORMATION OF WORK TEAMS

Cohesion

Groups have cohesion whenever belonging to them is considered positive and members feel attracted to the group. This can be considered from two points of view:

a. social cohesion refers to the bonds of interpersonal attraction that unite the members of the group;
b. task cohesion refers to the way in which the attitudes and skills of the group come together for optimal performance.

Social cohesion can be promoted by carrying out team-building activities such as:

a. designing a logo or another type of identification for the team;
b. sharing information on new jobs;
c. promoting activities that reveal the common characteristics of members.

Task cohesion can be developed through activities that allow team members to evaluate their respective skills, strengths and weaknesses.

Assigning functions and standards

Standards are the rules that govern the behaviour of team members. By keeping to functions that have been explicitly identified, the team can carry out its tasks efficiently. It can be positive about carrying out activities that allow the group to discuss and agree on functions and rules for the team because this will guarantee their adoption.

Communication

Good interpersonal communication is vital to carrying out any type of task. Some experts suggest conducting exercises where members must listen to the others, and both give and receive information.

Identification of objectives

It is important for team members to have common objectives relating to their teamwork and for each member to specify individual objectives clearly. For this it is necessary to identify the team's mission and objectives.

Positive interdependence

Group learning is characterized by positive interdependence between members of the team, with each member responsible for their own learning, as well as the learning of the team as a whole.

Development of teams

Teamwork is the foundation of a modern company. The best approach to developing teams is to begin early and to be open and honest with all involved. Everyone needs to know that they are in the team for a particular reason and that their contribution is important. Team members should therefore document their ideas and strategies to create the final product. Then they should all meet to discuss their ideas and reach a consensus on a common plan of action. Once the plan has been established it is important to keep all participants involved through a continuous flow of information.

An example of teamwork and leadership

Kelly's Food Products won the 2005 Prize for Excellence in the Competitive Venezuela programme "Venezuelan success". Kelly's Food Products is a pioneering company involved in growing, processing and marketing of vegetables in Venezuela. It maintains high quality standards for all of its processes to guarantee customer and consumer satisfaction, as well as to preserve the environment. It was established by two young university graduates in 1984.

The reasons for selecting it as a successful case were as follows:

- Teamwork proactively focused on the customer and the mutual welfare of employees, commercial partners and shareholders.
- The leadership model focused on the achievement of objectives that contribute to continuous growth and development.
- Financing of 160 small producers in the Andean region, covering soil analysis and preparation, provision of plantlets according to soil characteristics, technical assistance, agricultural inputs and a guarantee to purchase the entire harvest.
- Direct livelihood for 800 people in the rural sector.
- Self-sufficiency in liquid and solid biofertilizer. Implementation of advanced technologies.
- Mechanical harvesting and a distribution chain throughout the country.

Appendix 3

Selection of priority processes for drawing up a company's process map

Table A3.1 presents a methodology for selecting priority processes. Even though the methodology is practical and useful, it is difficult to implement in small companies where:

i. there is no business management development;
ii. the producer is involved in all the processes;
iii. there is a low level of identification and development.

However, the methodology can be very useful where an external consultant or extension worker is available and capable of guiding its implementation. That is why it is presented here as further reading for those who are interested. To illustrate this topic, the processes of an agro-industrial enterprise have been selected according to how far they contribute to meeting four specific objectives:

- fulfilling 95 percent of orders;

TABLE A3.1
Example of the method to identify priority processes that meet specific objectives

Processes	Objetives				Score: ● High = 10 points ■ Medium = 5 points X Low = 1 point		
	1	2	3	4	Impact of the process	Repercussions for customer	Total
1. Strategic management	■	●	●	■	30	10	300
2. Marketing	●	●	X	X	22	10	220
3. Administration and human resources	●	■	●	■	30	5	150
4. Production planning	●	■	●	●	35	5	175
5. Production	■	●	●	●	35	10	350
6. Storage	■	●	●	■	30	5	150
7. GMP–HACCP	■	●	●	■	30	10	300
8. Maintenance and calibration	●	■	■	●	30	5	150
9. Procurement and purchasing	●	■	●	X	26	5	130

Source: *Guide for identifying processes* (no date).

- customer satisfaction measured as a reduction in complaints of up to 90 percent;
- zero problems associated with product safety;
- 28 percent reduction in losses resulting from failure to meet quality criteria.

Processes with the highest scores are recognized as key or priority processes. In this example, those that made the greatest contribution to the four specific objectives were considered to be:

i. strategic management;
ii. variables relating to production;
iii. the application of GMP programs;
iv. the HACCP system.

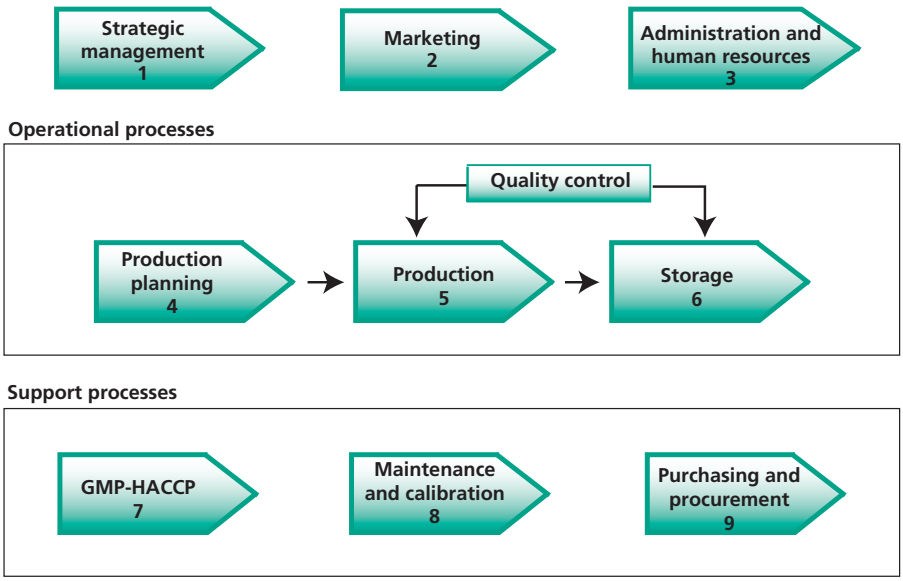
Appendix 4

Description of each process and interactions between processes

DIAGRAM OF PROCESSES CARRIED OUT IN A FRUIT AND VEGETABLE-PROCESSING COMPANY

P1: Strategic management
P2: Marketing
P3: Administration and human resources
P4: Production planning
P5: Production
P6: Storage
P7: Quality and safety assurance
P8: Maintenance and calibration
P9: Purchasing and procurement

FIGURE A4.1
Schematic representation of the interactions among processes



MODULE 3

FIGURE A4.2
Process P1: Strategic management

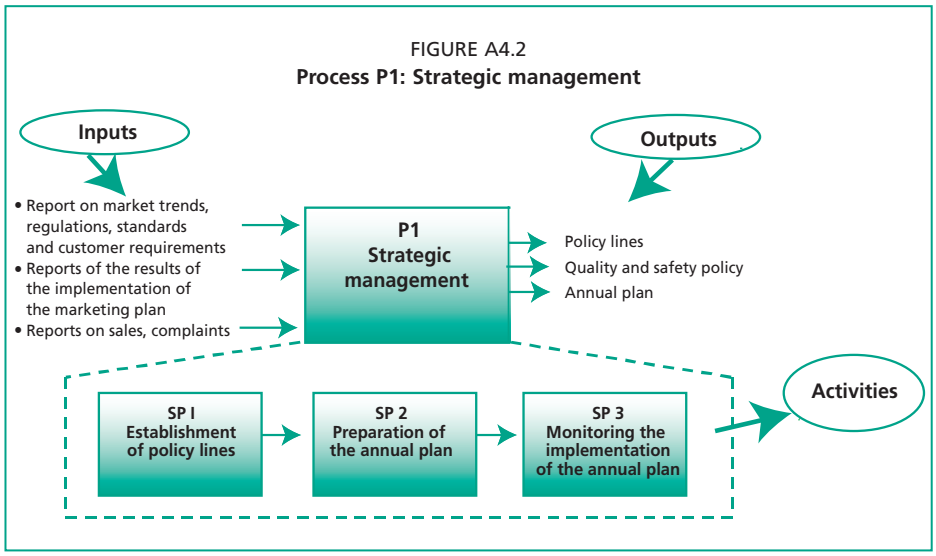


FIGURE A4.3
Process P2: Marketing

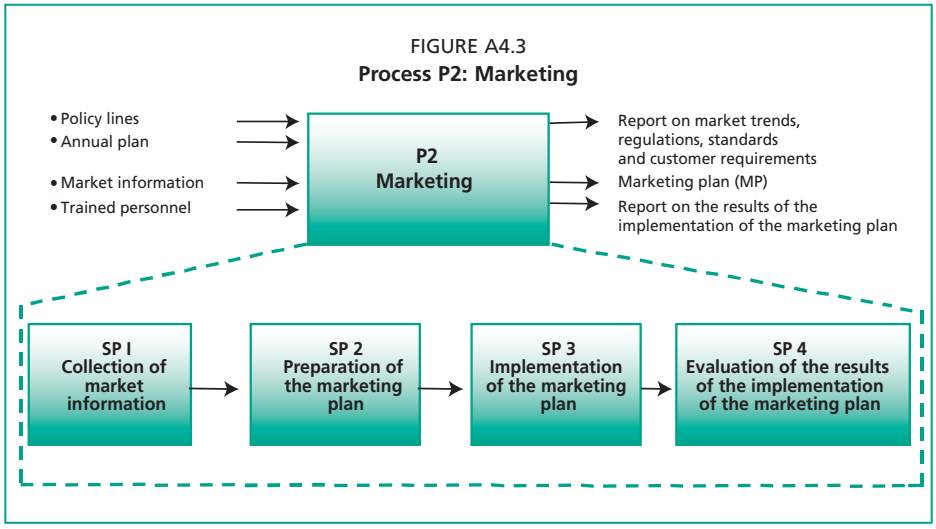
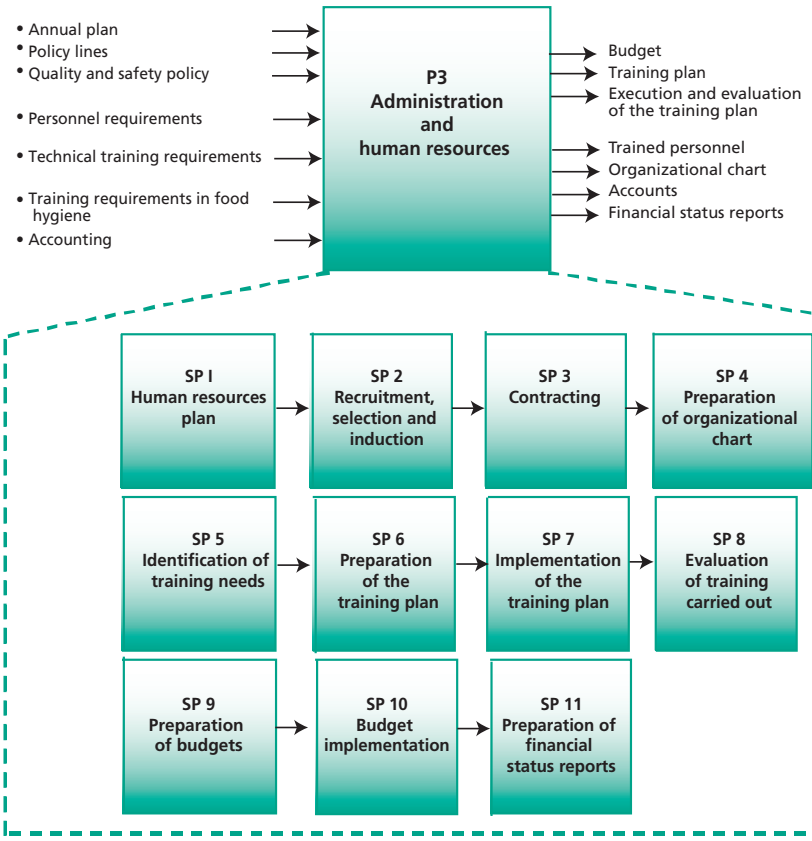


FIGURE A4.4
P3: Administration and human resources



MODULE 3

FIGURE A4.5
P4: Production planning

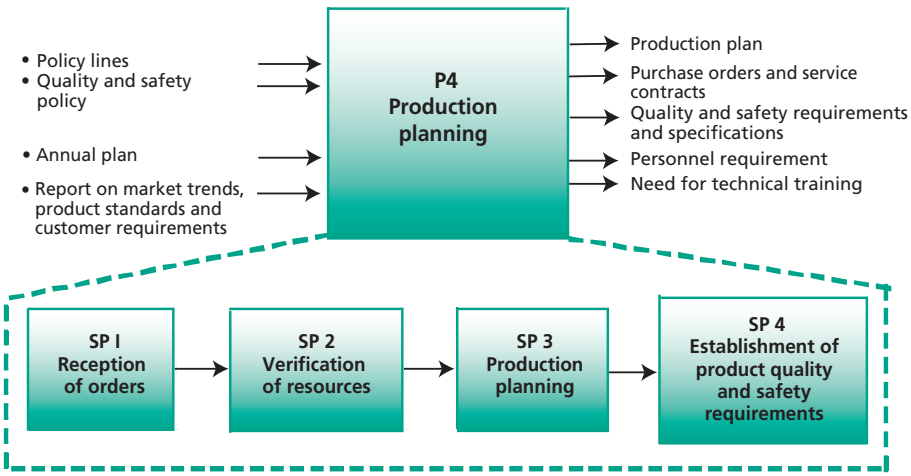


FIGURE A4.6
P5: Production

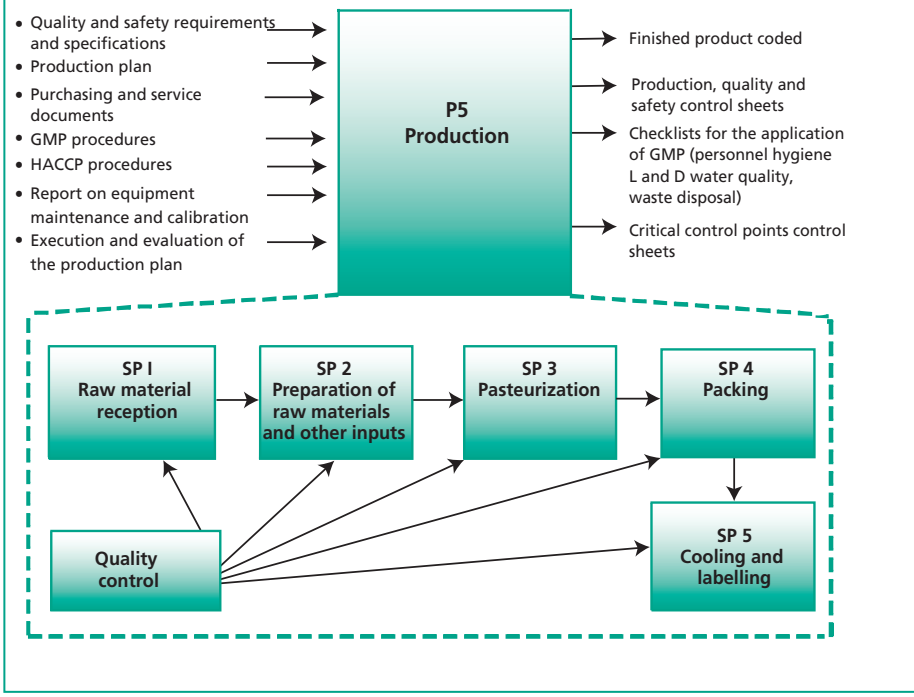
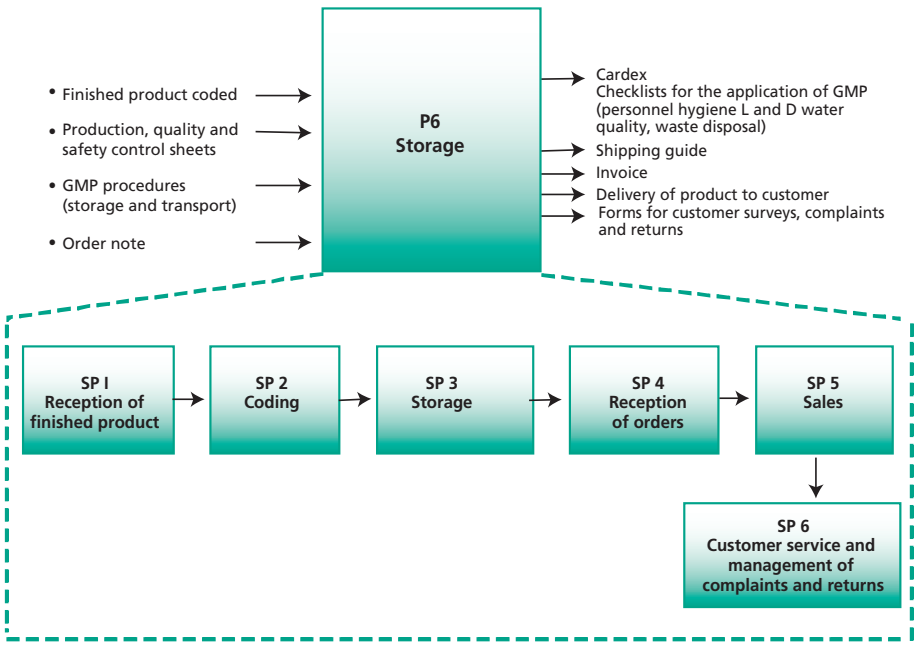


FIGURE A4.7
P6: Storage



MODULE 3

FIGURE A4.8

P7: Quality and safety assurance

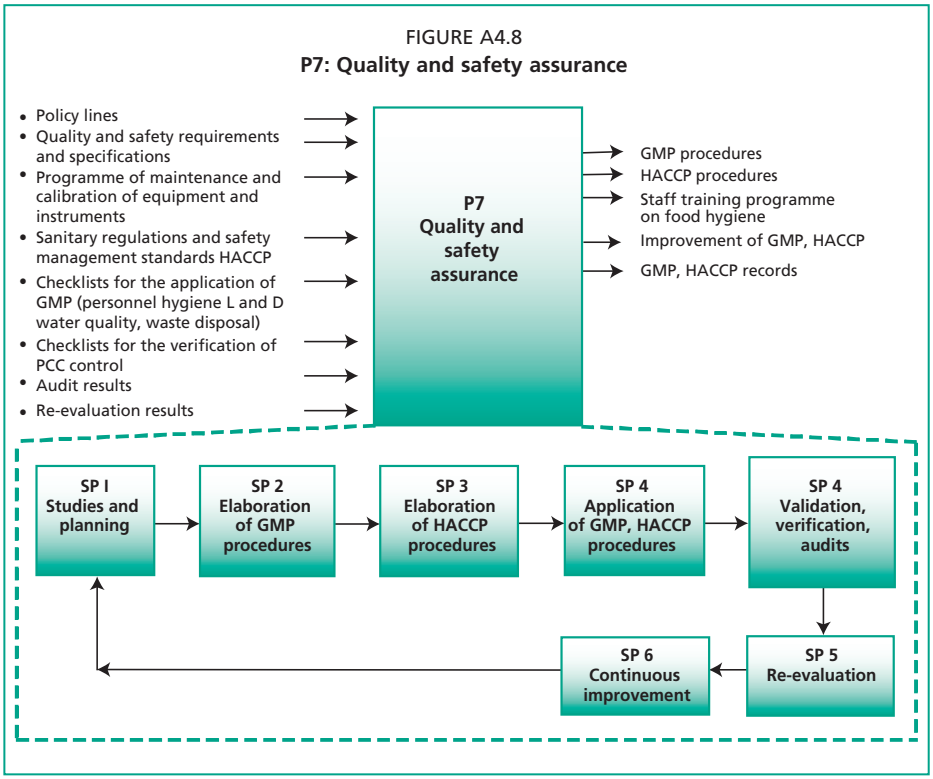


FIGURE A4.9
P8: Maintenance and calibration

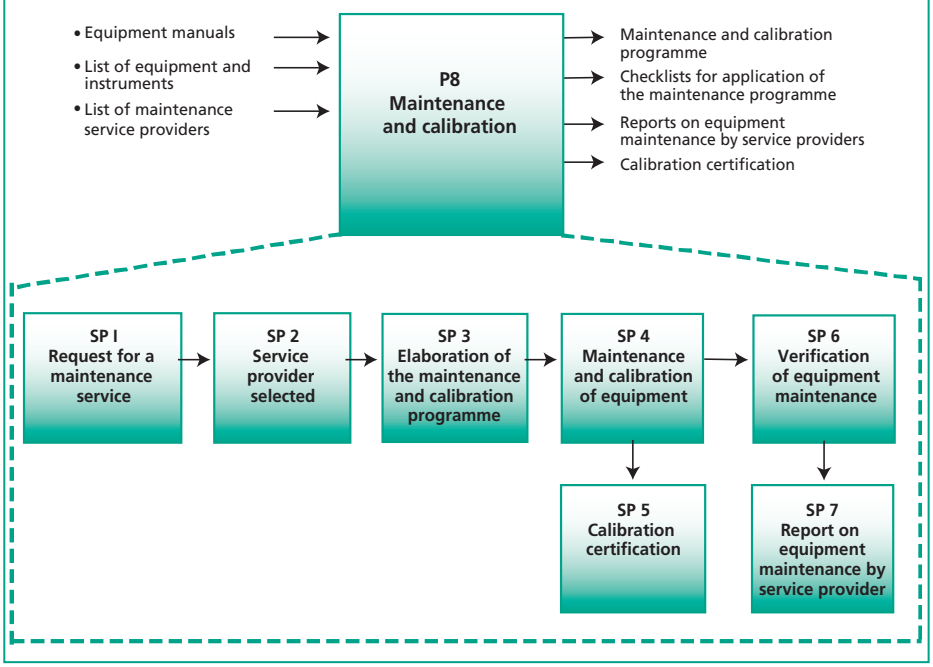


FIGURE A4.10
P9: Purchasing and procurement

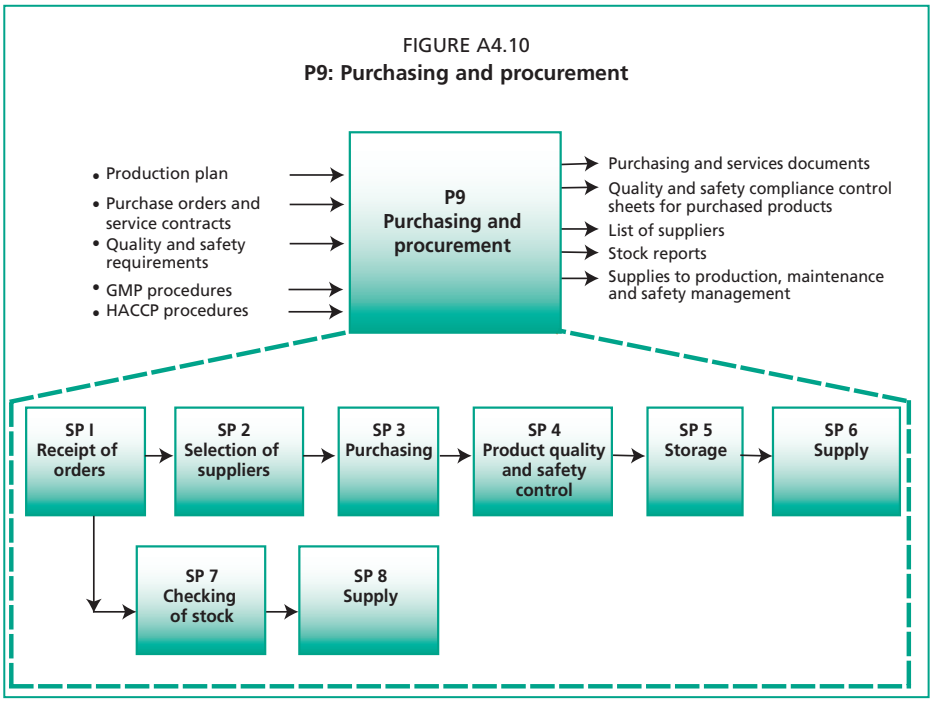
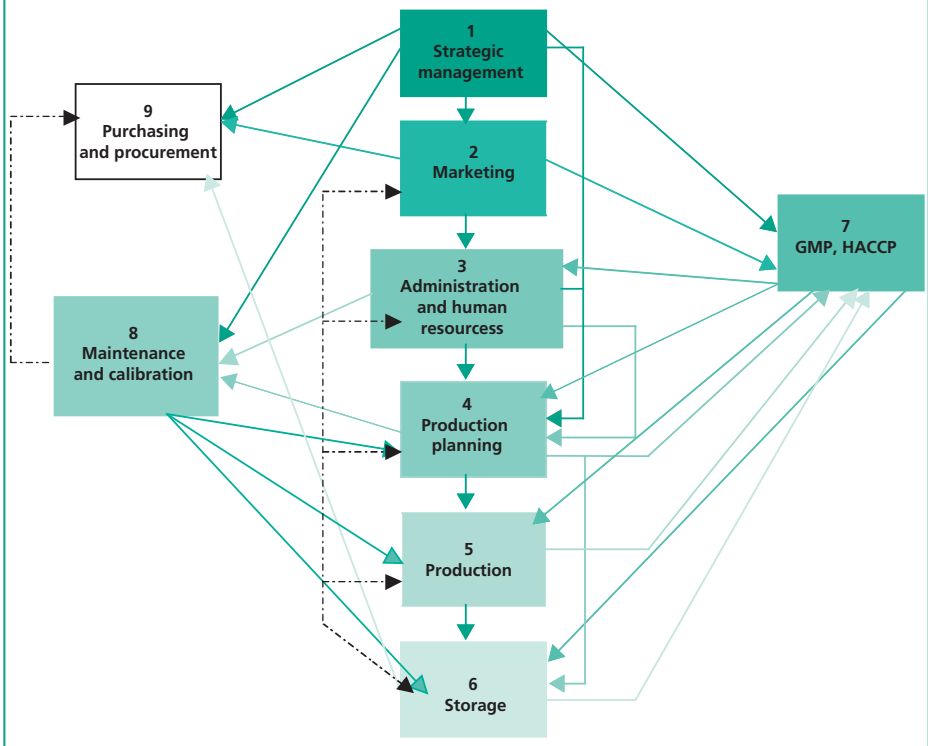


FIGURE A4.11
Schematic representation of the interactions among processes



Appendix 5

Examples of process cards and interaction between processes

EXAMPLE 1: PROCESS CARD

Process – Management of processes	
Objective of the process	• Establish guidelines for management and development of the business based on the customer's needs and compliance with local regulations and with efficiency and quality • Establish strategies that assist in achieving the objectives outlined in the company's mission and vision
Indicators	• Percentage of personnel who are aware of the company's policies • Percentage of fulfilment of the annual business plan
Scope	• Applies throughout the company
Documents and records	• Company policy documents • Annual business plan
Person in charge	• General manager
Resources	• Personnel • Office materials
Inspections	• Once a year the degree of fulfilment of the annual plan will be reviewed by means of an internal audit • Staff awareness of company policies is reviewed annually through staff surveys
Control variables	• Policy is disseminated and understood by staff • Application of annual plan. Identifies where it is possible to 'act' in order to control the process
Failure conditions	• High percentage of production is not accomplished • Products do not meet specifications
Interaction with other processes	• These are presented in Table A5.1.

TABLE A5.1
Interaction with other processes

Process (P) supplier	Input	Subprocess (SP)	Output	Client of the process
P2 Marketing	Report on market trends, regulations, standards and customer requirements	SP1 Establishment of policies	Policy lines Quality and safety policies	P2 Marketing P4 Production planning P9 Purchasing and procurement P7 GMP–HACCP P3 Administration and human resources
P2 Marketing	Report on the results of applying the marketing plan	SP2 Preparation of the annual plan	Annual plan	P2 Marketing P4 Production planning P8 Maintenance and calibration P3 Administration and human resources
P6 Storage	Report on sales, complaints and returns			

EXAMPLE 2 – PROCESS CARD

Process 7: Quality assurance (GMP–HACCP)	
Objective of the process	• To guarantee the safety of products through compliance with regulations in the target markets and the implementation of HACCP systems
Indicators	• Percentage of procedures that are not applied or are inadequately applied • Percentage of corrective measures that are applied • Number of issues identified in an audit • Percentage of deviations found during monitoring
Scope	• All the processes of production, planning, purchasing and procurement, preparation of raw material and inputs, finishing of products and sales management
Documents and records	• Safety policy • GMP procedures (records of activities carried out) • Standardized operational procedures (and records of the application of the procedures) • HACCP plan • Staff training programme on food hygiene (records) • Improvement in safety management • Records of control and monitoring activities carried out
Person in charge	• Head of quality control and the HACCP team
Inspections	• Compliance with the annual plan is reviewed twice a year, through an internal audit and validation of the HACCP plan
Control variables	• Application of GMP programmes (control measures) • Critical control points (in HACCP) and application of corrective measures • Issues identified in an audit
Failure conditions	• Presence of contaminants in products • GMP and HACCP procedures are not applied or are applied inadequately • Non-conformance in an audit
Interaction with other processes	• These are presented in Table A5.2.

MODULE 3

TABLE A5.2
Interaction with other processes

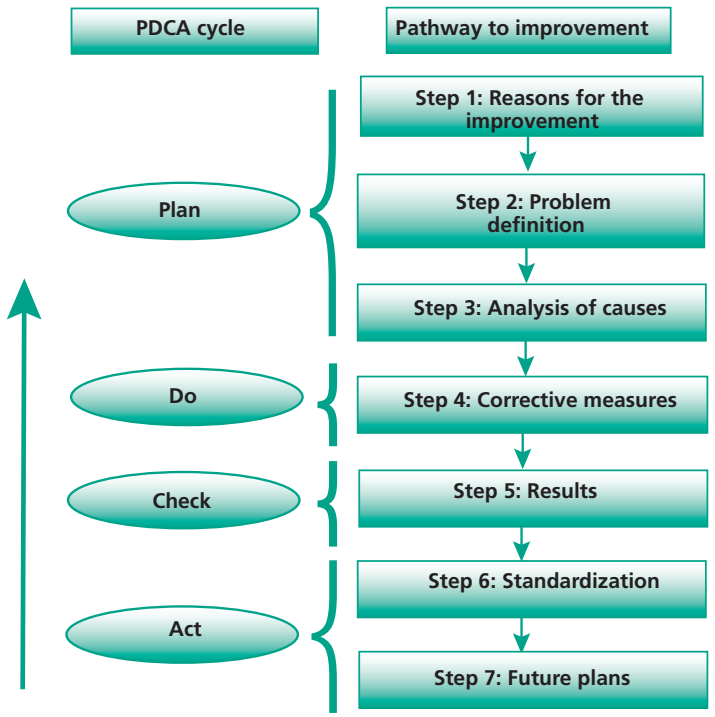
Process (P) supplier	Input	Subprocess (SP)	Outputs	Client of the process
P1 Strategic management	Policy lines	SP1 Study SP2 Preparation of GMP procedures SP3 Preparation of the HACCP plan	HACCP Plan GMP Procedures Training programme in food hygiene	P4 Production planning P9 Purchasing and procurement P5 Production P6 Storage P8 Maintenance and calibration P3 Administration and human resources
P2 Marketing	Market information			
External	Sanitary regulations and safety management standards HACCP			
P4 Production planning	Production plan			
P8 Maintenance and calibration	Maintenance and calibration programme			
P3 Administration and human resources	Payroll and staff profile			
P9 Purchasing and procurement	Purchasing and procurement of materials	SP4 Application of GMP and HACCP	Application of GMP and HACCP	P4 Production planning P5 Production P6 Storage P8 Maintenance and calibration
P5 Production	Checklists for the application of GMP (staff hygiene, control of water quality, waste disposal) Checklist for critical control points and corrective measures	SP6 Continual improvement of the system	Continual improvement of the system (begins with new HACCP study)	P4 Production planning P9 Purchasing and procurement P5 Production P7 GMP–HACCP P3 Administration and human resources P8 Maintenance and calibration
SP4 Validation, monitoring and auditing	Audit results Re-assessment results			

Appendix 6

The pathway to improvement[4]

This is a technique for solving problems by following a structured sequence of seven steps. When this technique is applied systematically it becomes a process of continual improvement. Figure A6.1 illustrates these seven steps on the pathway to improvement.

FIGURE A6.1
Steps on the pathway to improvement



[4] The methodology for an improvement project has been developed with reference to the following documents:
- *Manual Gestión de la Calidad para Servicios de Sangre* of the Pan American Health Organization – Materiales of the Course *Mejora Continua de la Gestión* organized by SENATI, Lima, Peru, 2005.
- *Handbook of quality tools: the Japanese approach*, 1990.

STEP 1: IDENTIFICATION OF THE ELEMENTS TO BE IMPROVED

Any improvement project begins with the impetus or leadership of the company's management, i.e. with the commitment to improve the company's policies and objectives. This commitment implies provision of the resources necessary to implement continual improvement processes.

As the analysis in Theme 3 of this module shows, the process approach generates information on processes and specific activities where a company could make improvements. Some company activities for defining priority items for improvement are:

- analysis of measurement data;
- review of audit results;
- review of indicators;
- analysis of surveys and customer needs;
- opinions of employees in the different departments;
- assessment of the company's performance over a specific period;
- information on the fulfilment of objectives and goals, the behaviour of company components, review of complaints from both internal and external customers, etc.;
- application of corrective and preventive measures; where and why they were applied.

When this information is analysed, the gap between the actual and desired situations can be determined. There is a range of management tools for determining which priority topics should be analysed; some examples are given in Appendix 8.

STEP 2: PROBLEM DEFINITION

In any given process – whether operational, support, strategic or management – it is possible to identify a number of problems that need to be addressed, as well as opportunities. It is important for entrepreneurs and their working groups to analyse defined objectives in order to identify those that would do most to reduce the gap between the actual situation and the desired situation. The Pareto diagram in Appendix 8 illustrates a useful tool for analysing identified problems.

STEP 3: ANALYSIS OF CAUSES

This step consists of identifying and analysing the causes of the problems requiring improvement. A technique used for analysing the causes of problems and identifying solutions is a **cause and effect diagram.** An example of this technique is given in Appendix 7.

STEP 4: CORRECTIVE MEASURES AND PREPARATION OF AN ACTION PLAN

Once the fundamental causes of the problem have been identified, measures or solutions are determined and an action plan is drawn up to implement these measures. It is essential to carry out a feasibility analysis, not only from a technical standpoint, but also to determine the economic and administrative feasibility

of implementing the proposed measures. Appendix 7 shows how a matrix of corrective actions can serve as useful tool for defining actions (Table A6.1).

An action plan is an ordered list of everything that must be done to ensure that corrective measures are applied. The plan should answer the following questions:

- **What is to be done?** Description of the corrective measures.
- **Who is in charge of implementing them?** Identifies the person responsible for applying the corrective measures.
- **When?** The deadline or the duration of the period of action.
- **How is it to be done?** Description of methods and procedures.
- **Where are the measures to be applied?** The place where the corrective measures will be applied.
- **For what reason?** What will be achieved by the corrective measures?
- **How will you determine whether or not the measures are being applied correctly?**

STEP 5: REVIEW OF THE RESULTS

This step consists of checking to what extent the implemented measures have resolved the problem. Problem indicators are compared before and after applying the measures. Bar graphs help to visualize the 'before' and 'after' situations and show the degree of improvement. Figure A6.2 depicts different types of graph that can be used.

STEP 6: STANDARDIZATION

If the results show improvements as a result of following the pathway, the next step is to incorporate the measures into the company's working procedures to ensure that they are applied permanently. Employees are trained to apply the procedures and monitoring systems are established to check that the measures are applied correctly.

STEP 7: FUTURE PLANS

In this final step, the working group analyses the results of the improvement process by answering the following questions:

- What was done well?
- What can be improved or corrected?
- What should be done differently?
- Which lessons have been learned?

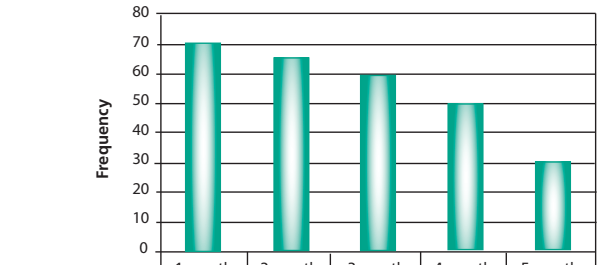
TABLE A6.1
Example of the format for preparation of an action plan

Action plan							
Project:							
Responsibility for the project:							
Date of preparation:							
Date of review							
What? Activity or task	**Who? (Person in charge)**	**When? Timing**	**How will it be done?**	**With what?**	**Where will it be done?**	**For what? Objective**	**Monitoring months**

After this the pathway cycle is repeated to ensure continual improvement of the business processes.

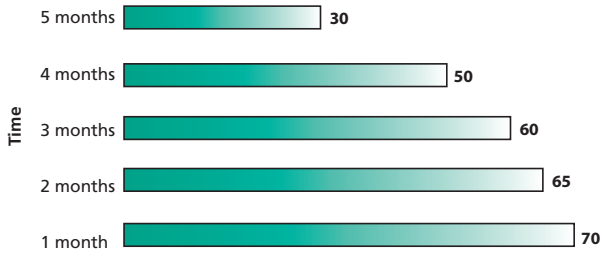
FIGURE A6.2
Examples of visual formats for presenting results

Reduction of raw material with physical damages



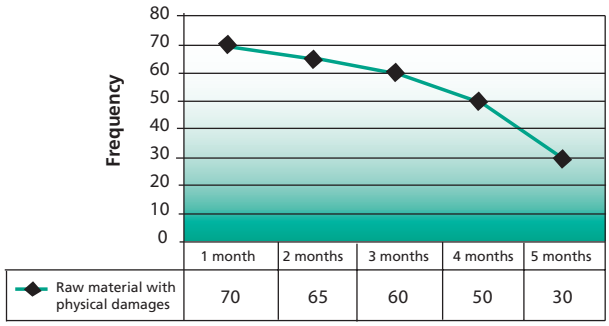
Vertical bars

Reduction of raw material with physical damages



Frequency horizontal bars

Reduction of raw material with physical damages



Line graph

Appendix 7

Methodologies for determining the causes of a problem and establishing corrective measures

METHODOLOGIES FOR DETERMINING THE CAUSES OF A PROBLEM: THE CAUSE–EFFECT DIAGRAM

Whenever a problem exists and there are differing ideas or opinions on its possible causes, it is always useful to apply the cause–effect diagram technique.

HOW IS A CAUSE–EFFECT DIAGRAM DRAWN UP?

The **effects** relate to specific quality characteristics or to process problems (e.g. losses of quality, safety problems, etc.). The **causes** are the factors that influence or determine the **effects** that have been identified. These include: inappropriate methods, environment, poor quality materials, poorly maintained machinery and equipment, incorrect measurements, unsatisfactory staff behaviour, etc. The 'spines' of the diagram are arrows that indicate the relationship between the effect and the causes. The steps to be followed in drawing the diagram are as follows.

Step 1: Identify the primary causes and write them at the end of the 'main spines' which connect to the 'central spine'

A practical approach is to consider the six 'Ms': manpower, materials, machinery, method, medium (environment) and measurement (control). Each team can use these particular criteria or devise their own, according to the situation. Figure A7.1 shows a general cause–effect diagram.

Step 2: Identify the main causes of the effect

The factors contributing to the main causes are identified. These are denoted as secondary causes, not for their lesser importance but because of their place in the sequence. If necessary, third-level causes may be identified, as well as successive levels. This process is very important as the diagram's effectiveness depends on it. It is important to encourage discussion and several rounds of questioning in the group until the root cause is identified (Figure A7.2).

Figure A7.3 shows the main and secondary spines for identifying the probable causes affecting the control of the reception of raw materials.

MODULE 3

FIGURE A7.1
General cause-effect diagram

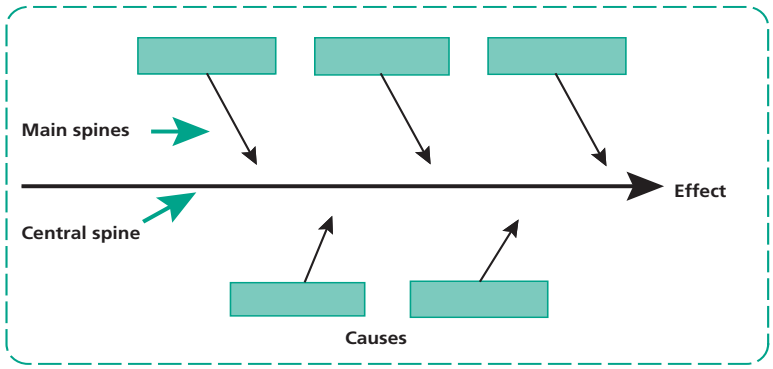
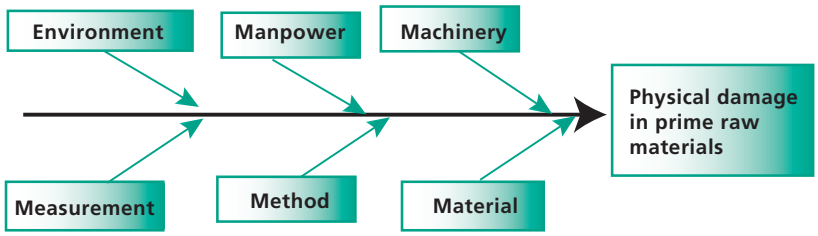


FIGURE A7.2
Identification of the main causes in a cause-effect diagram



Step 3: Check that no factors have been omitted

When the diagram is complete, working team members must check that they have not forgotten any significant factors and, if so, these factors must be included in the diagram.

Step 4: Choose the main causes likely to have the greatest impact

This means that a level of importance is attributed to each factor and a circle is drawn around each factor. These are the factors that have the greatest impact on the problem. The next step is to use data to check these main causes. It is not sufficient to check that the main cause exists where the problem exists, it is also necessary to check that the main cause does not exist where the problem does not exist. (Figure A7.4).

FIGURE A7.3
Main and secondary spines in a cause-effect diagram

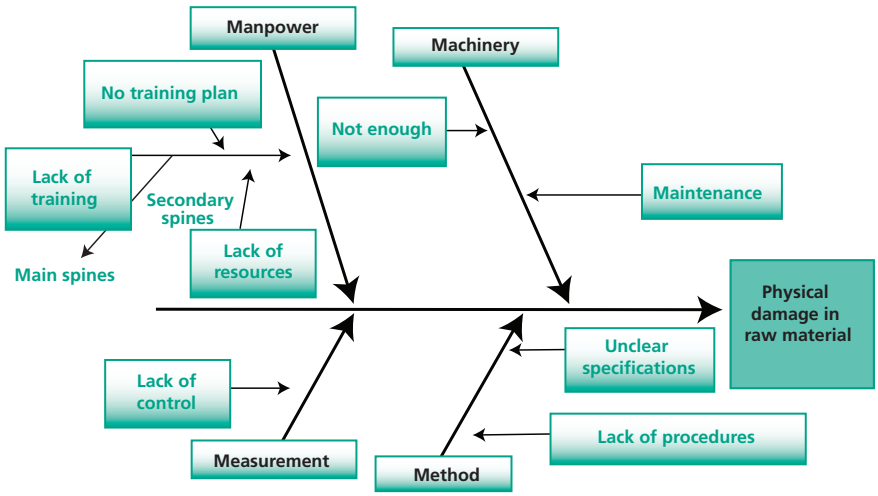
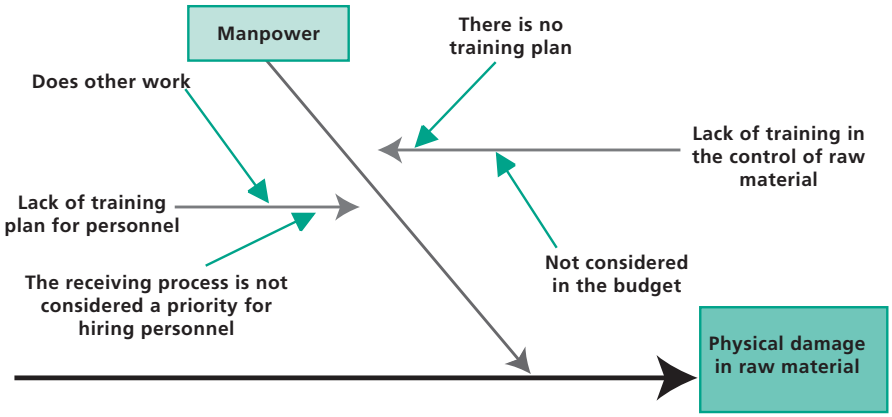


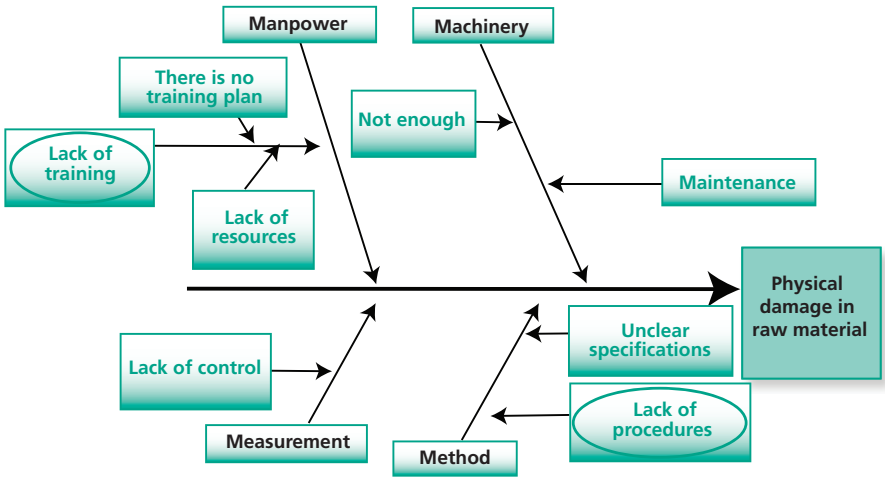
FIGURE A7.4
Detailed analysis of major causes



Step 5: Important information is noted

Data referring to the product and the process being analysed should include the names of people who worked on the analysis; this data must be written down. Additional data could be included on the product, process and date. The example in Figure A7.5 shows that the fundamental causes are a lack of training and lack of procedures.

FIGURE A7.5
Selection of fundamental causes



METHODOLOGIES FOR IDENTIFYING CORRECTIVE MEASURES

After identifying the main causes of the problem, the corrective measures for resolving the problem are selected. The following example shows a useful procedure that can be used to support this process.

Corrective measures matrix

This takes the form of a tree showing the relationship between the problem, its main causes and corrective measures. It is constructed as follows:

Step 1: Write the problem statement in the box marked 'problem'.

Step 2: Place in the 'causes' boxes the causes that have been identified and checked in the cause-analysis stage (one or more).

Step 3: Identify the corrective measures for each main cause. Brainstorming or multivoting methods to reduce the number of topics are generally recommended for identifying corrective measures and methods.

Step 4: Identify the most suitable method by attributing to each method a score of 1–5 for its effectiveness and feasibility.

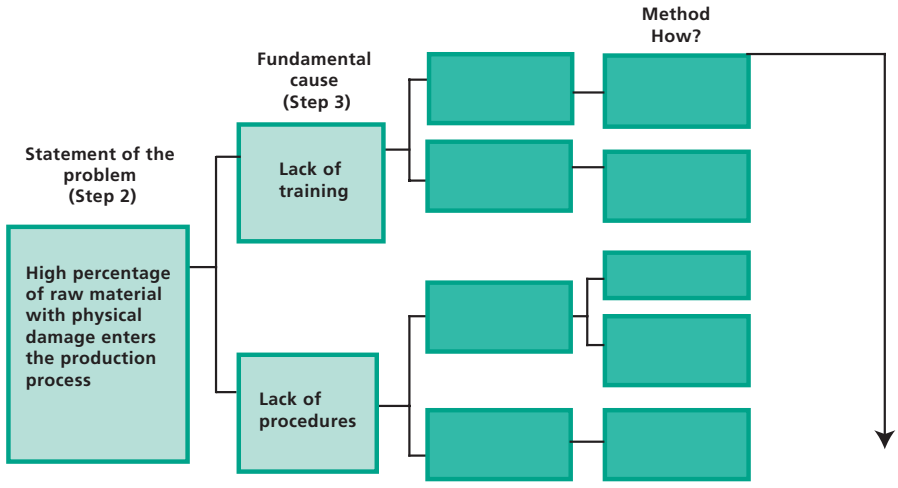
Effectiveness is the measure's ability to reduce the main cause. ***Feasibility*** is the potential for carrying out the corrective measure effectively. The scoring scale is as follows:

1 = none; 2 = little; 3 = moderate; 4 = significant; 5 = excellent

Step 5: Lastly, multiply the scores for effectiveness and feasibility and then classify the corrective measures according to the total score

A number of corrective measures can be implemented, depending on available resources and the improvement objectives. In the box marked 'Action', indicate whether or not the action will be carried out (Figure A7.6).

FIGURE A7.6
Corrective measures diagram



Effectiveness	Feasibility	Total	Action

Appendix 8

Methodologies for identifying and prioritizing problems for improvement

This section presents different methodologies and examples for the identification of problems for improvement, as well as methodologies for analysing identified problems.

METHODOLOGIES FOR THE IDENTIFICATION OF PROBLEMS FOR IMPROVEMENT

- brainstorming
- multivoting
- matrix for prioritizing areas for improvement (selection of areas)

Brainstorming

This is a dynamic and participatory methodology (involving all the members of the working team) that promotes the generation of ideas (in this case on areas for improvement). It comprises the following three steps.

Generation of ideas

In this step, the working team explains the brainstorming objective and scope. Team members are given 5–10 minutes to write down their ideas. At this stage it is the number of ideas that is important rather than the quality (this is achieved later). After this 5–10 minute period (during which the ideas are neither examined nor discussed), each member presents one idea in each round of presentations. If any of the participants has no further ideas when their turn comes around, the next participant continues.

Clarification

Each group member explains their idea and the rest of the team comment and express their opinion of it.

Assessment

Where ideas are similar, they are grouped together, while duplicated ideas are eliminated.

Example: the operational processes working group of a small fruit processing industry presented the following ideas for improvement

- Improve relations with suppliers.
- Reduce the waiting time for raw materials.
- Improve control of raw materials at reception.
- Hygiene training for staff.
- Increase stocks of packaging, bottles and jars.
- Programme daily talks on hygiene for the personnel.
- Improve interpersonal relations and the work atmosphere.
- Prepare work instructions.
- Improve sanitation in the processing area.
- Improve the distribution of work areas.
- Increase the number of the finest sieves in the pulper.

Multivoting

A group of topics can be chosen by means of a series of successive votes.

First vote

Each member of the team votes for the topics they prefer, allocating only one vote to each topic. The topics receiving total votes equal to or greater than half the number of participants are entered in the second round of voting.

Second vote

Each member is now given votes equivalent to half the number of topics on the new list. As in the previous round, each participant is allowed only one vote on each topic.

Matrix for the selection of topics

After brainstorming and multivoting, the following topics were prioritized:

- Improve relations with suppliers.
- Improve control of raw materials at reception.
- Hygiene training for staff.
- Increase stocks of packaging, bottles and jars.

Successive voting

The second round is repeated until only 3–5 topics remain. Each team member scores the topics selected by multivoting in accordance with two factors: their

potential impact on the customer (Y) and the need for improvement (X). The scale for scoring both factors could be: 1 = none; 2 = little; 3 = moderate; 4 = significant; 5 = excellent. The final score is obtained by multiplying factors X and Y. In addition:

- participants score secretly so that they are not influenced by the others;
- the score for each topic is the average of all its scores;
- the topic receiving the highest score is chosen because the members of the team have selected this topic as having the greatest impact on the customer and the greatest need for improvement (or whatever the identified objective is).

Continuing with the example, one participant scored the topics as follows.

Matrix for the selection of topics			
Topics	**Impact on the customer (X)**	**Need for improvement (Y)**	**Total (X × Y)**
Improve relations with suppliers	3	4	12
Improve control of raw materials at reception	5	5	25
Hygiene training for staff	4	4	16
Increase stocks of packaging, bottles and jars	5	4	20

In this case, the participant awarded the highest score to the topic "improve control of raw materials at reception".

Methodologies for analysing identified problems

After selecting the topics, the next step is to perform a more in-depth analysis on the basis of their impact on the defined objectives. One technique that facilitates this analysis is the Pareto diagram.

The Pareto diagram

This is a bar graph depicting the order of comparison of factors relating to a problem. This comparison makes it possible to identify a few key factors that contribute significantly to the problem, in order to separate them from many other factors that contribute very little to the problem. This graph is useful as it identifies key factors requiring attention at a glance, and therefore enables the necessary resources to be focused on corrective actions without wasting effort.

Characteristics

The Pareto diagram is used to identify key elements of a particular problem.

- It shows the level of defective products, repairs, production process defects, complaints, errors or accidents.
- Good analysis and its interpretation depend largely on prior analysis of causes and the data collected.

STEPS IN DRAWING UP A PARETO DIAGRAM

Step 1: Analysis of the data that led to identification of the problem

For the topic chosen by multivoting ("improve control of raw materials at reception"), it is desirable to identify all the problems involved in this topic and to select the problem with the greatest impact. The problems that occur most frequently are identified by analysing the data.

Example: in this case, data on different production lots were collected over a six-month period and the following problems were identified according to their frequency.

Problem	Details of the problem	Frequency
A	Raw materials (fruit and vegetables) with mechanical damage and cuts	78
B	Underweight	9
C	Raw materials fail to meet technical specifications (Brix and acidity)	63
D	Unsuitable varieties	7
E	Unsuitable maturity level	5
F	Contaminated and dirty raw materials	11
G	Received more than required	3
H	Raw materials with insect damage	10
I	Other	4
	Total	190

Step 2: Data are tabulated and cumulative numbers are calculated

The problems should be organized in descending order, from the highest frequency to the lowest. Cumulative numbers are calculated starting with the highest level, which is increased by the number in the level below for each row, as shown in the next example. The data in the above table show that the problem that has the greatest frequency is raw materials with mechanical damage, followed by raw materials that fail to meet technical specifications.

Step 3: A graph is drawn on the X and Y axes

The problems are displayed in descending order from left to right on the horizontal axis.

Step 4: The data are displayed as a bar graph

The data are presented in descending order on the horizontal axis, as shown in Figure A8.1.

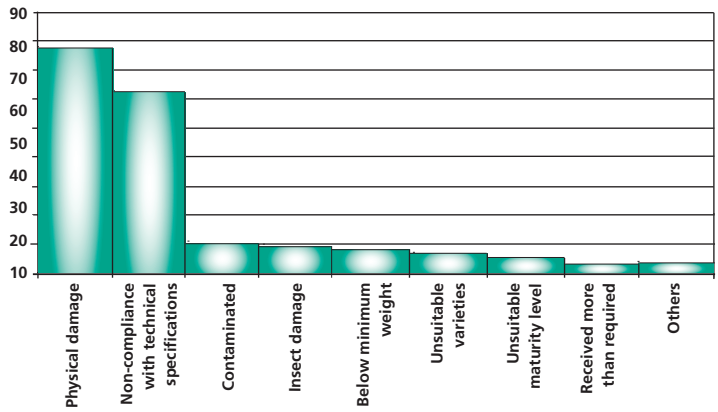
Step 5: A graph showing the curve of the cumulative data is drawn

The curve begins over the bar representing the topic with greatest frequency (Figure A8.2).

Example

Problem	Details of the problem	Frequency	Cumulative
A	Raw material (fruits and vegetables) with mechanical damage and cuts	78	(+) 78
C	Raw materials fail to meet technical specifications (Brix and acidity)	63 (+)	141
F	Contaminated and dirty raw materials	11	152
H	Raw materials with insect damage	10	162
B	Underweight	9	171
D	Unsuitable varieties	7	178
E	Unsuitable maturity level	5	183
G	Received more than required	3	186
I	Others	4	190
	Total	190	

FIGURE A8.1
Bar graph in descending order

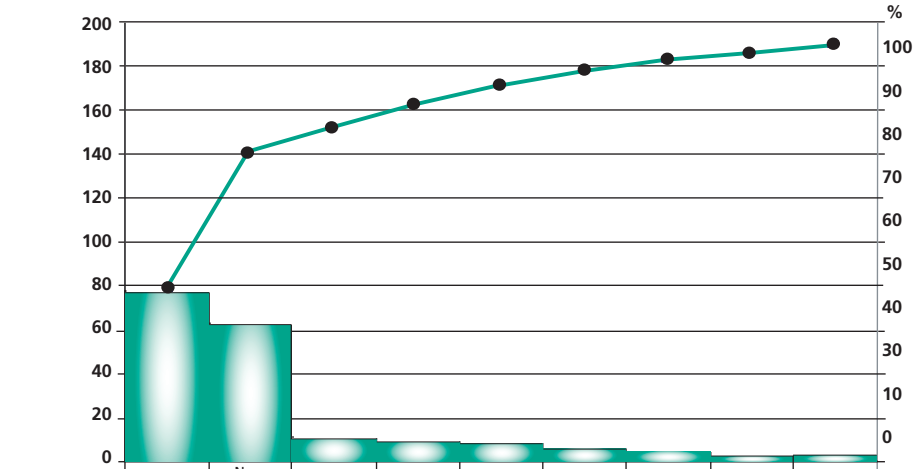


Step 6: A vertical line is drawn to visualize the percentage scale

A vertical line is drawn on the right side of the graph as a percentage scale for each category. Figure A8.2 and Table A8.1 show that two of the problems (22 percent of the nine problems listed) cause 74 percent of the problems relating to unsatisfactory control during the reception of raw materials. According to the Pareto principle, the highest proportion of problems relates to only two problems, meaning that, if their causes are eliminated, most of the problems will disappear.

MODULE 3

FIGURE A8.2
Graph of problems



	Physical damage	Non-compliance with technical specifications	Contaminated	Insect damage	Below minimum weight	Unsuitable varieties	Unsuitable maturity level	Received more than required	Others
Series 2	78	63	11	10	9	7	5	3	4
Series 1	78	141	152	162	171	178	183	186	190

Step 7: Problem statement

In the above example, the problems that occur with the greatest frequency are:

- raw materials have physical damage;
- raw materials fail to meet technical specifications.

The working group should choose one of these two problems, taking into account customer requirements relating to the problem identified.

TABLE A8.1
Analysis of the problems

Problem	Details of the problem	Frequency	Percentage
A	Physical damage	78	41.05
C	Raw materials fail to comply with technical specifications (Brix and acidity)	63	33.16
F	Contaminated and dirty raw materials	11	5.79
H	Raw materials with insect damage	10	5.26
B	Underweight	9	4.74
D	Unsuitable varieties	7	3.68
E	Unsuitable maturity level	5	2.63
G	Received more than required	3	1.58
I	Other	4	2.11
	Total	190	100.00

Next, an improvement objective and a problem statement must be draw up. For example:

- The improvement objective is: "To reduce by 50 percent the defects resulting from physical damage of raw material that enters the plant for processing."
- The problem statement is: "A high percentage of raw material with physical damage enters the processing stage from raw materials reception."

Appendix 9

The purchasing department in an agro-industrial enterprise

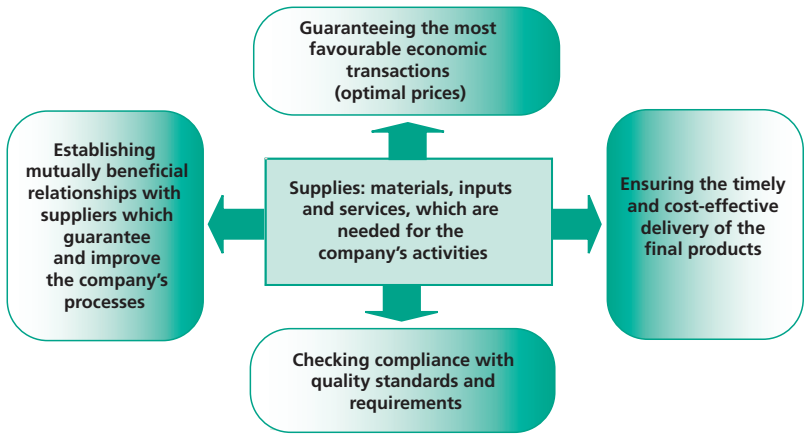
Like every other type of company, agro-industrial enterprises have organized and synchronized areas or departments responsible for managing productive resources (labour, capital and natural resources) in order to produce goods and services that can be sold in the marketplace.

One of these areas is purchasing, the influence of which extends to the whole organization. The purchasing department maintains a close relationship with all other functional areas (Figure A9.1). Deficiencies in purchasing management can have a serious affect on the quality of the final product, production efficiency and the company's financial. Any action aimed at improving purchasing must therefore take into account the demands made on the other areas of the company.

IMPORTANCE OF THE PURCHASING DEPARTMENT

The purchasing department is one of the main sources of cost in an industrial company. It has a direct impact on the quality of the final product and the effectiveness of production flow. Purchasing problems can also generate inefficiencies, such as failure to meet deadlines and excessive hidden costs.

FIGURE A9.1
Purchasing department objectives



MANAGEMENT OF PURCHASING ACTIVITIES

A company that decides to purchase materials must manage a number of purchasing activities. Purchasing management takes into account several factors, including inventory and transport costs, the availability of supplies, the efficiency of delivery and the quality of supplies.

Basic purchasing tasks include: (i) selecting suppliers and establishing close relationships with them (strategic alliances); (ii) preparing and adapting specifications for materials ordered; (iii) timely ordering; (iv) preparation of contracts and purchase orders to avoid possible legal problems; (v) checking the reception of materials; (vi) resolving differences with suppliers and (vii) checking that invoices are paid. Pay attention to any problem, no matter how small, and find an immediate solution in order to avoid any possible delay or error in production that might threaten the company's stability. Purchasing management has many functions, which may be grouped under:

i. general functions;
ii. management functions;
iii. administrative functions.

General functions

Manage the purchase of materials, components, equipment and installations, subcontracting of product services, etc. to ensure that what is required is made available at the right time and at the optimal price, while complying with established specifications.

Management functions

Plan purchases
Establish objectives and strategies.
Negotiate purchasing conditions.

Organize purchases
Organizational and functional structure

Control main variables
Price, level of service, loyalty, stock levels, indirect costs, transport

Improve purchases

Administrative functions

Selection and approval of suppliers
Requesting bids from suppliers
Analysis of bids
Selection of suppliers
Negotiation of purchasing conditions
Placing of orders
Monitoring of orders
Management of material shipments
Reception of materials
Control of suppliers' invoices
Evaluation of suppliers

DESCRIPTION OF THE PURCHASING PROCESS

Need for purchasing

As the purpose of purchasing is to supply materials and services to the entire company, it must be coordinated closely with the areas of management, production, sales, accounting and storage.

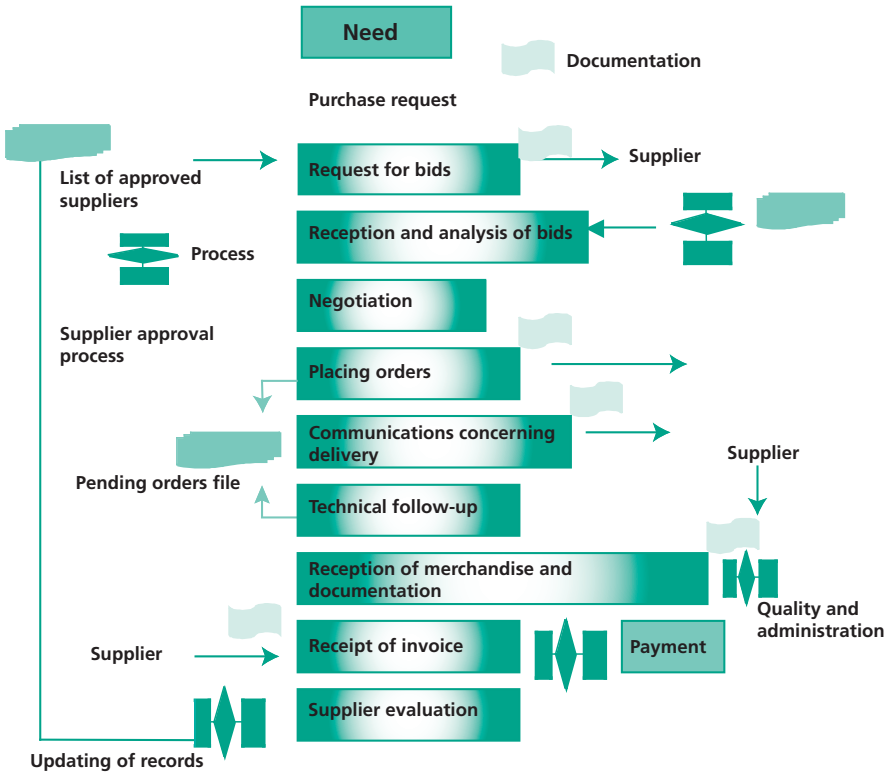
Purchase request

The purchasing process begins with a requisition (Figure A9.2). Once this is received by the purchasing department, it is reviewed to make sure that the following are clearly defined:

- date of acquisition;
- department of origin;
- name of requester;
- article requested;
- quantity;
- delivery date;
- any observations, plus the requester's signature.

The purchase requisition is then reviewed to check that it has been correctly authorized in accordance with company policy. If necessary, any relevant copies of plans or quality specifications should be attached to the requisition.

FIGURE A9.2
Purchasing process within the company



Source: Adapted from TECNUM (no date).

Attached information

The information to be attached to the requisition should, if necessary, include:

- technical documentation showing the characteristics of the product to be purchased;
- plans;
- quality specifications;
- the recommended supplier.

SUPPLIER SEARCH AND ANALYSIS

The next step in the process is for the buyer to seek sources of supply for the requested materials in order to analyse prices and then decide on the purchase. The buyer may consider one of the following search options:

- search from the database of suppliers/products;
- search from the approved list of suppliers;
- search for new suppliers.

When examining a particular supplier, consideration should be given to whether the products or the raw materials offered will have a positive impact on the company's productivity, quality and competitiveness. Consequently, supplier selection is the most important decision taken by the purchasing department. For supplier analysis and selection, as well as for any subsequent negotiations, buyers must have experience of the markets for the raw materials being purchased. They should be able to interpret quantitatively any changes in markets because such changes will be of great interest and could affect the company directly. Finally, they should keep statistics and record important data on market behaviour relating to each material, as this is an important factor in purchasing decisions.

Call for bids (tendering)

Specifications for the call for tender should include:

- delivery quantity, deadline, place and person in charge;
- certification, documentation, guarantees, form of payment, materials to be used, type of packaging, type of pallet;
- tests to be carried out, approval, security requirements, etc.

Negotiation

After receiving the bids, the next step is negotiation. For this step, both parties must work together in good faith because the company needs to purchase quickly and the supplier needs to sell. Negotiations cover price, delivery, form of payment, stocks, etc.

Placing the order

Once the bid has been accepted, the next step is to place the order using a document that specifies the following: article, total quantity, price, form of payment, place of delivery, address to send invoices, lots to be delivered, essential documentation, testing, date of audit, type of packaging and any other relevant details.

Monitoring the order

The order may be monitored by means of documentation on:

- order flow details;
- lists of orders pending;
- identification of late orders;
- reminders to suppliers.

Reception of the order

Once the buyer and the seller have reached an agreement and have signed a contract, or an order has been placed, the supplier should ship the merchandise using the most appropriate means of transport, or whatever means has already been agreed. The merchandise is accompanied by a document called a shipping note. Other documents include:

- certificate of quality, certificate of materials;
- operating or instruction manuals;
- guarantees.

Supplier	
Representative:	Customer details:
Ports:	
N° of loads:	
Shipping mode:	
Point of delivery:	

Date: _____ Shipping note number: _____ Order number: _____

Code	Quantity	Description	Price	Department	Cost

Name and Signature:	Observations:	Accompanying documents
Received by:		
Freight carrier:		

IMPORTANCE OF THE SHIPPING NOTE

A shipping note is important because it ensures:

- confidence in product delivery;
- updating of stocks and pending quantities;
- payment planning;
- completion of the provisional account statement.

Invoice reception and control

At this stage, quality control is carried out on the merchandise that has been received. If the merchandise is acceptable, the administration will make the necessary payment.

Key process: checking the conformity of the invoice

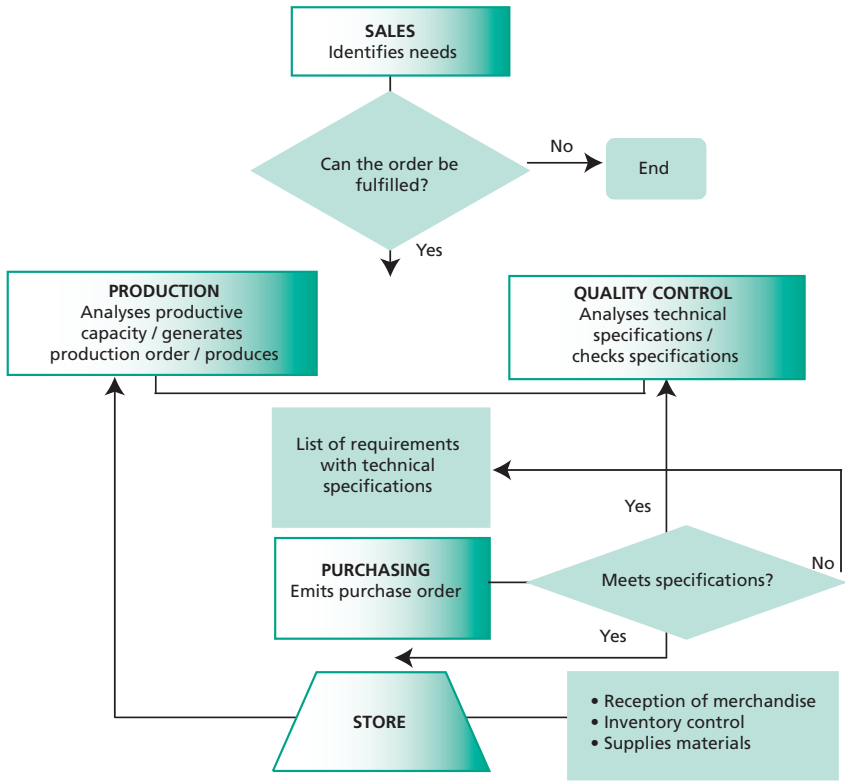
Assessment of suppliers

This topic is discussed in Appendix 11. Figure A9.3 shows the supply process and the relationship between purchasing and other areas.

COORDINATION AND COMMUNICATION BETWEEN THE PURCHASING DEPARTMENT AND OTHER AREAS OF THE COMPANY

The purchasing manager should maintain a close relationship with all other managers responsible for the different areas of the company because they are internal customers of the purchasing department. The purchasing department has a close relationship with the accounting, production, sales, quality control and

FIGURE A9.3
Supply process flow to different areas of the company



storage departments. However, the production department is the one that makes the greatest use of the purchasing department's services.

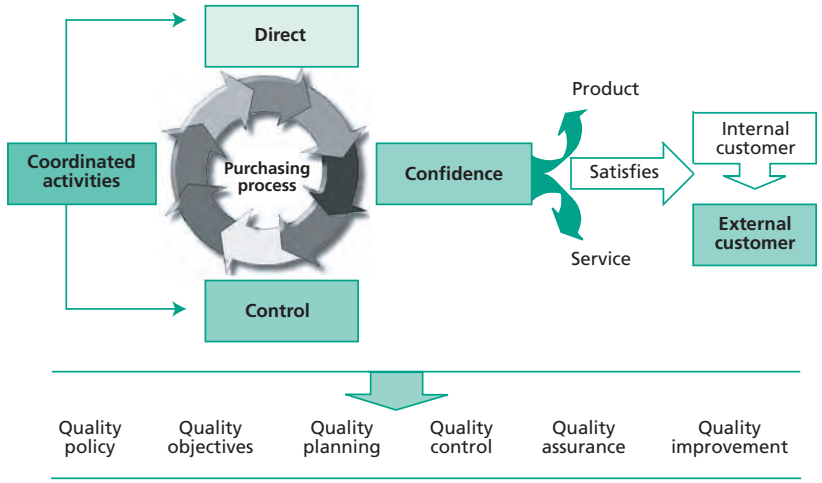
Quality control and the purchasing department

Quality control is one of the most important factors in achieving consistency and confidence in all products involving fresh fruit and vegetables. As with all aspects of marketing, quality control requires careful planning, research, administration and discipline, together with regular training and reviews of procedures. The supplier must therefore implement a programme that incorporates worker training and good practices. These measures should prevent the recurrence of any problems that could lead to a loss of income and prestige.

Quality management in purchasing

All the points defined above are necessary to ensure high quality; they are achieved by means of appropriate quality management in purchasing. These points are illustrated in Figure A9.4. Quality management requires a set of coordinated activities (planning and programming) to direct and control the purchasing process to ensure that only reliable products that satisfy customers' needs are purchased. The following planning actions are required to meet the objectives of the company's established policies: (i) collection of data; (ii) determination of goals and objectives; (iii) formulation of general and detailed plans. Programming consists of arranging this set of actions into a specific sequence and time frame.

FIGURE A9.4
Quality management in purchasing



Source: Logistic management (undated).

The purchasing manual

The basic structure underpinning quality management for purchasing activities is the purchasing manual. This acts as a guide for the department. It describes the department's quality policies, objectives and organization and identifies the operations it performs. The purchasing manual should follow the lines of the general manual and should promote operational efficiency by identifying the responsibilities of each position and the actions to follow, in line with company policy. It should also contain instructions concerning the performance of operations so that it can be used as a reference document for resolving any problems that might occur in the operation of the purchasing department.

Appendix 10

Cooperation between actors: the key to quality and safety throughout the supply chain

Cooperation involves joint efforts to achieve a common objective. Through cooperation mechanisms, companies or people voluntarily agree to pool their strengths in order to achieve a common goal. In this case, the objective is to ensure product quality and safety throughout the agrifood chain.

The new approach to quality and safety management systems involves an understanding of: (i) the relationships between the different actors that form part of the product supply chain and (ii) the responsibility they share in maintaining product quality and safety. Strengthening relationships between the relevant actors is essential to ensuring quality and safety along the entire supply chain. Cooperation through alliances and different mechanisms for working together is the key to success in this field.

SOME OF THE REASONS WHY COOPERATION IS VITAL IN SMALL AND MEDIUM AGRO-INDUSTRIAL ENTERPRISES

Agro-industrial enterprises use many coordination and integration mechanisms, such as strategic alliances and full operational integration. For example, they may produce raw materials themselves and market the products directly as a way of reducing the uncertainty involved with suppliers and product marketing. Cooperation and integration initiatives (e.g. mergers, strategic alliances and contracts) are carried out not solely by large companies, but also by small and medium companies where cooperation is crucial for seizing market opportunities and ensuring the company's profitability and sustainability over the long term. Small and medium companies need to:

- Build knowledge and capacity, as well as using the necessary resources to produce safe, quality products. They also need to incorporate innovations and technological developments that help them to optimize their business processes. Small and medium enterprises encounter major constraints and difficulties in this area. Alliances between a company and other entrepreneurs and institutions can help them successfully to implement changes that are vital for achieving their business objectives.
- Create an appropriately competitive environment, for example, through economies of scale, reduction of business costs and permanence in the market

with a consistent supply of products. Cooperation mechanisms are crucial to creating such an environment.

- Reduce constraints relating to credit, technical assistance, high logistical costs and other problems affecting the competitiveness of the industry as a whole. Alliances between companies are key to mutual growth and expansion in this area.

Such cooperation networks can be classified as follows:

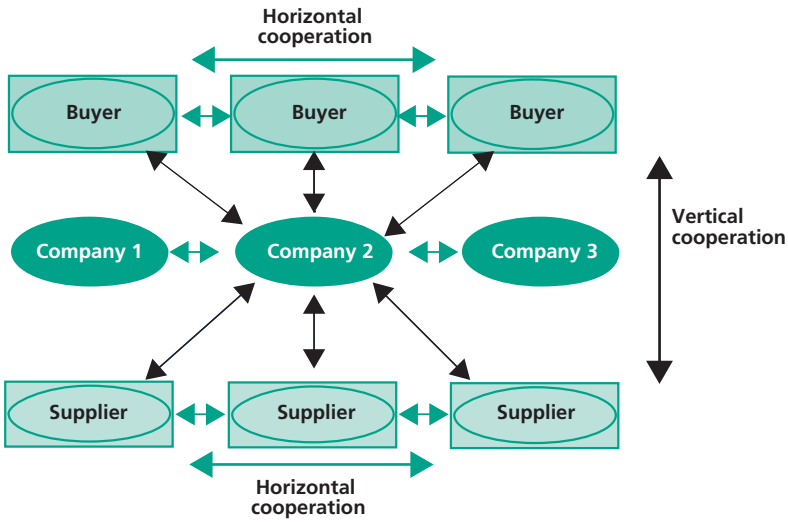
- **Vertical cooperation networks** are mechanisms for cooperation between actors involved in different links of the chain. Contacts, consultation and cooperation mechanisms between companies and their suppliers (the link immediately preceding it), or between the agro-industrial enterprise and its customers or product buyers (the next link), form part of vertical cooperation networks.
- **Horizontal cooperation networks** are mechanisms for cooperation between actors involved in the same link of the chain. Producers' associations, export consortia and business associations are examples of horizontal cooperation networks (Figure A10.1).

ADVANTAGES OF COOPERATION IN THE SMALL AND MEDIUM AGRO-INDUSTRIAL ENTERPRISE SECTOR

Some of the advantages of cooperation in the small and medium agro-industrial enterprise sector are:

- greater social impact through working relationships between the government sector, private sector and civil organizations;

FIGURE A10.1
Cooperation networks between the company and the actors with which it interacts



- greater availability of resources as a result of pooled efforts and more efficient use of resources;
- cooperation mechanisms strengthen each of the partners, adding value to what each partner knows best and generating concrete and significant results;
- improved social learning where each partner learns from the others, developing new work capacities;
- genuine innovation and relevant and integrated solutions to problems;
- improved competitive position of cooperating businesses;
- focusing the efforts of the companies involved drives the technological innovation process;
- exploiting business opportunities, capturing new customers with lower costs or a better quality/price ratio, establishing closer links with demand or providing more efficient services;
- the possibility of joint investments, which would be difficult to make individually;
- reduced uncertainty concerning the quality, availability, quantity (and sometimes price) of raw materials required for both the production process and customer satisfaction.

KEY FACTORS IN DEVELOPING SUSTAINABLE COOPERATIVE RELATIONSHIPS

Certain conditions are required for the establishment of cooperative relationships. Factors such as the perishability of the product, the level of production systems and increasing demand for quality and safety all contribute to the need for cooperation between actors in the supply chain. However, for cooperative relationships to last over time and produce the desired results, they must be based on mutual benefits for the parties involved. It is therefore important to choose an appropriate partner and define the principles that will govern the agreement. Below are some suggestions:

- Develop relationships based on trust, respect, transparency and shared responsibility.
- Set clear goals for each step in the process; for example, develop a list of objectives, establish priorities and identify weaknesses.
- Before starting to negotiate the terms of cooperation, both parties should clearly specify their requirements and the objectives they expect to attain through the alliance. Honesty is essential. Do not hide or distort your requirements but do not take a rigid position either.
- Share information. Collaboration should be part of the process from the beginning, and expectations and commitments should be established clearly and openly.
- Encourage the development of trust. Some of the parties should take the initiative and demonstrate their willingness to be frank. Lack of trust is an obstacle to the success of the partnership.

- Listen to the other party's requirements, because when these are understood any differences and common points can be identified before going on to explore options that satisfy both parties.
- Do not approach negotiations with the attitude of confronting a rival. The objective is for both parties to gain (win–win). If one of the parties loses, the result is worthless.
- Put difficult topics on the table. Inform your future partner of your non-negotiable points.

STRENGTHENING THE CLIENT/SUPPLIER RELATIONSHIP

The agro-industry creates economic links in the supply chain. It creates *forward links* to the final product markets in order to assess consumer reactions to the food products offered, as well as any changes in consumer preferences and expectations. It creates *backward links* to the producers of raw materials that allow agro-industries to transmit market signals to farmers that may have an economic impact on farmers' production decisions.

A company wishing to implement cooperation mechanisms should establish its strategy on the basis of the problem to be solved and/or the opportunities that would be created through cooperation with suppliers. In the example given, the company applies the planning principles specified in Theme 4 of this module, making it company policy to improve supplier management through cooperation as a means of improving the quality of raw materials arriving at the plant.

Step 1: Identification of partners

After identifying its need for cooperation, the agro-industry evaluates and selects potential partners, which includes not only suppliers but also support institutions that may contribute to solving the problem of poor-quality raw materials.

Step 2: Identify a common purpose – identify the reason why it is worth cooperating

Clarity of purpose is one of the key factors for successful cooperation. When identifying the common purpose for cooperation it is essential to formulate the objectives, strategies, actions and resources that will be involved simply, clearly and in a participatory manner. This information forms part of the cooperation action plan.

Step 3: Identify strategies

This part of the action plan involves determining what must be done to solve the problem, such as training, arranging credit and supporting work organization for producers.

Step 4: Define functions, responsibilities and commitments

These should be defined in accordance with each partner's strengths and capabilities.

Step 5: Define values and forms of organization

Establish the principles on which cooperation will be based and the way in which actors will be organized to carry out the activities in the action plan.

Step 6: Evaluate global and specific results

Based on the results from the monitoring process, the actors involved in the alliance jointly analyse what has been done well and what has been done poorly. Then they take the necessary measures to improve the weakest areas that are hampering the achievement of their objectives.

Step 7: Correct and improve

Implement the measures identified in the previous step, evaluating and improving as part of a continuous process.

BENEFITS OF COORDINATED WORK

In the case illustrated, the benefits of cooperation in the first year were reflected in the following achievements:

- The quality of the raw material improved, a good working team was established, and trustworthy producers benefited from access to the technological changes required to achieve the established goals.
- The internal potential of the company and its producers was improved; the most advanced technology was made available to suppliers, enabling them to improve their yields and the quality of raw materials substantially.
- Consensus and mutual benefits were achieved by means of commitments by both parties. For example, it was agreed that the company would extend the deadline for receiving raw material and, in turn, the producers agreed to ship higher-quality material.

Appendix 11
Supplier approval

A supplier wishing to work for a company with a supplier approval system must obtain approval before being able to supply its products or services. The approval process may be carried out in a number of ways.

AUDIT
A visit is made to the supplier to evaluate a series of previously defined factors. The supplier is given a rating on the basis of which approval is granted or denied.

PRODUCT TRIAL
The company uses the product that the supplier wishes to supply in its production process and the product's performance is assessed.

HISTORICAL APPROVAL
This is used for suppliers that have been working satisfactorily with a company for some time. An analysis is made of the quantities supplied, the results of control checks, the number and severity of complaints and the quality of service.

APPROVAL QUESTIONNAIRE
This is similar to the audit, but does not involve a visit to the supplier. A questionnaire is designed and sent to the supplier. Approval is dependent on the answers received. The people who should participate in the approval process are those responsible for purchasing and quality maintenance within the relevant departments (production, storage, etc.). The list of approved suppliers should be circulated to all company employees responsible for purchasing so that nothing is acquired from suppliers that are not on the list. Once a supplier is approved, ensure that the initial expectations are maintained over time. This requires regular assessment.

SUPPLIER RE-ASSESSMENT
Re-assessment of suppliers is becoming an increasingly common practice. It consists of frequent performance assessments by examining records relating to the entry of raw materials into the plant to determine whether suppliers should retain their rating. If not, the areas where the supplier needs to make improvements should be identified. The reports or records generated by the re-assessment process should be communicated to suppliers clearly and coherently. They should be as specific as possible to facilitate action by the supplier to correct the problem. Small and medium enterprises should develop simple criteria for supplier

assessment and re-assessment. Table A11.1 shows an example of the steps taken by one agro-industrial company to strengthen relations with its suppliers and to improve its competitive position in the target market.

BENEFITS OF COORDINATED WORK

In the case illustrated, the benefits of cooperation in the first year were reflected in the following achievements:

- The quality of the supplier's raw material improved, a good working team was established and trustworthy producers benefited from better access to the technological changes required to achieve the established goals.
- The internal potential of the company and its producers was improved, and the most advanced technology was made available to suppliers, enabling them to improve their yields and the quality of raw materials substantially.
- Consensus and mutual benefits were achieved by means of commitments by both parties. For example, it was agreed that the company would extend the deadline for receiving raw material and, in turn, the producers agreed to ship material of higher quality. As a result, rejects of materials fell from 15 percent to 7 percent.
- The links between the suppliers and the company were strengthened, which allowed both parties to grow, especially the company (through the development of new, higher quality products and timely delivery of raw material).

ELEMENTS TO CONSIDER IN STRENGTHENING THE COMPANY/SUPPLIER RELATIONSHIP

Supply management

Agro-industrial companies may choose one of three options for procuring the raw material they need for their operations: (i) buy or rent land to produce the material needed; (ii) acquire raw material from buyers or intermediaries in wholesale markets or local markets, according to supply and demand or (iii) establish relationships with specific suppliers to coordinate the need for materials with these suppliers' production capacities (Diaz, 1999). The option of producing raw materials is hardly feasible in the small and medium agro-industrial sector. Similarly, the strategy of buying products in wholesale markets according to supply and demand is risky. The most viable option is therefore to build cooperation networks with suppliers that offer a product with the quality specifications and timeliness that the company requires.

For this strategy to be successful, the company should have a unit that is responsible for:

a. selecting suppliers;
b. defining the quality specifications;
c. product presentation;
d. communicating these requirements to suppliers;
e. drawing up contracts and purchase orders;

TABLE A11.1

Strengthening the client/supplier relationship

Identify the need for cooperation		Step 1	Step 2	Step 3	Step 4	Step 5	Step 6	Step 7	Step 8
Company: Damper Agro-industries		**Identify partners (strengths)**	**Identify common purpose**	**Identify strategies to achieve objectives**	**Roles, commitments and responsibilities**	**Identify values and how to organize**	**Identify mechanisms for monitoring and assessment**	**Evaluate general and specific results**	**Correct and improve**
Processing of artichokes	Coordination between actors								
Competitiveness									
Increasingly strict quality and safety requirements in markets		Producers' associations, universities, agrochemical distribution companies, local banks, institutions promoting innovation, non-governmental organizations	Promote enterprise development, with social inclusion, generating benefits for producers and purchasing companies, as well as, indirectly, contributing to the development of municipalities			Transparency, inclusion, shared responsibility, excellence, loyalty, trust, respect, honesty	How are we doing? What are our results? What should be improved?	After one year the company will have reduced by 15% the percentage of rejects of raw materials entering the plant	Identify and implement actions
Problem									
The company lacks the capacity to maintain a permanent supply of products of consistent quality that satisfies the demands of the target market									
Main causes of the problem									
Problems associated with poor quality during processing of the product in the plant Low quality of raw material entering the plant									
Strategic planning									
Vision: to be the leading company at national level in the production of processed artichokes that satisfy export markets Mission: to process artichokes of excellent quality to serve export markets									

TABLE A11.1
Strengthening the client/supplier relationship (Continued)

Identify the need for cooperation		Step 1	Step 2	Step 3	Step 4	Step 5	Step 6	Step 7	Step 8
Company: Damper Agro-industries		**Identify partners (strengths)**	**Identify common purpose**	**Identify strategies to achieve objectives**	**Roles, commitments and responsibilities**	**Identify values and how to organize**	**Identify mechanisms for monitoring and assessment**	**Evaluate general and specific results**	**Correct and improve**
Processing of artichokes									
Policies									
Improve quality management of the processes carried out in the plant; improve quality management starting with suppliers Objective of improved supplier management 90 percent of raw material entering the plant meets the established quality criteria	Coordination between actors					Committees, working groups, etc.	Company records, partnership records, number of loans that have been approved, etc.		
Causes of poor quality management at producer level									
Technology: low technological level, lack of experience in crop production, inappropriate use of agrochemicals, etc. Management: no record- keeping of the quality produced. Marketing: sell to the company when its prices are more competitive than those of intermediaries Associations: low level of organization (associations exist but are ineffective) Finance: constraints on access to credit that would allow new production methods to be adopted (such as upgrading of rural irrigation)				Training/ technology transfer/ access to credit Training and incentives Procurement planning/ conclusion of contracts Training and incentives Training/ funding for investments	Universities/ non-governmental organizations (NGOs)/ company/bank Universities/ NGOs/company/ bank Company/ Producers' associations Company/NGOs Purchasing Company/local bank				

f. checking the reception and quality of raw material;
g. resolving disputes with suppliers;
h. checking that invoices are paid;
i. dealing with any problems that arise and finding immediate solutions, thereby preventing any holdups or errors that could threaten the company's stability.

Appendix 9 details the steps involved in the purchasing process for any product/raw material required by an agro-industrial company. In this section, the focus is on quality control and supplier assessment and selection by the company.

QUALITY CONTROL OF RAW MATERIALS

Quality control at reception is one of the most important steps in quality management because, to a large extent, the quality of the raw material entering the company determines the quality of the final product. Quality control of raw materials entails planning, research, administration and discipline, together with regular training and a continual review of procedures. The basic structure underpinning quality management for purchasing activities is the purchasing manual. This acts as a guide to quality policy and objectives, the company's purchasing process and the definition of the operations that it will perform. It includes the procedures to be followed for the control of the raw materials entering the plant, based on established specifications.

Below are some quality management considerations to be taken into account in the plant reception area:

- The employees working in the product reception area should understand the product technical specifications clearly (e.g. colour, size, defects, presentation).
- The purchase order or purchase contract should describe precisely the quality requirements for the product.
- Suppliers should be informed of the requirements demanded by the buyer in terms of product quality and presentation.
- Quality control should be conducted on the raw material and inspection and testing must be carried out to check that all requirements are met.
- Raw materials received from the supplier should satisfy all the quality and other requirements established in the purchase order or contract.
- Records should be kept indicating the quality of the product received by each supplier, specifying the causes of any rejection or return of the material when it fails to meet the quality specifications.
- Specifications should give the supplier a clear idea of the quality being requested.

THE QUALITY MANAGEMENT APPROACH STARTING IN THE FARMER'S FIELD

The new process approach to quality means that buyers must work very closely with suppliers to identify the main factors that prevent compliance with quality

requirements. They should also support measures for the prevention and/or control of the causes of quality and safety deterioration in the product, starting in the farmer's field. The objective is to develop clear and realistic quality specifications and to work with suppliers in a cooperative manner to ensure that these targets are achieved.

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11

Cost-effective management tools for ensuring food quality and safety

FOR SMALL AND MEDIUM AGRO-INDUSTRIAL ENTERPRISES

The purpose of this manual is to improve and build the capacities of small and medium agro-industrial enterprises in order to guarantee the quality and safety of food products. The approach integrates the different factors that affect the capacity of a business to produce foods to meet market expectations and recognized standards, while maintaining and increasing the profitability and life of the business. Management and technical aspects are integrated through a practical and cost-effective approach.

The manual includes four modules on the following subjects: the use of market information for improving quality management; systems and tools for improving quality and safety management in agro-industry; the application of quality management principles in small and medium agro-industrial enterprises; planning as a tool for improving quality and safety management.

The manual contains case studies, exercises and bibliographic references, as well as a trainers' guide, PowerPoint presentations (on CD-ROM), appendices with further reading, links of interest and a glossary. The manual aims to assist trainers and entrepreneurs wishing to use the material for self-learning. With this manual, the Food and Agriculture Organization of the United Nations (FAO) provides the small and medium agro-industry sector in developing countries with an important tool for improving competitiveness and the capacity to deliver high-quality products to consumers.

Module 3: Application of quality management principles in small and medium agro-industrial enterprises