

Business management for small-scale agro-industries

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Acronyms and abbreviations

CETEC	Corporation for Interdisciplinary Studies and Technical Assistance
CHT	Cape Honeybush Teas
CIAT:	International Center for Tropical Agriculture
CIRAD-SAR	French Agricultural Research Centre for International Development- Agri-food and rural systems department
EAN	European Article Number
EU	European Union
HACCP	Hazard Analysis Critical Control Point
HNP	Honeybush Natural Products
IDRC	International Development Research Centre of Canada
INCOTERMS	International Commercial Sales Terms
ISO	International Organization for Standardization
kg	kilogram
P.A.Y.E:	Pay-as-you-earn
SSCC	Serial Shipping Container Code
WHO	World Health Organization
WTO	World Trade Organization

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Introduction

The **purpose of this publication** is to present leaders of associations with several of the business management techniques.

It has the following objectives:

- To assess the importance of finance management techniques as tools that help us to know if the enterprise is really winning or how profitable a new business can be.
- To discover the real importance of modern managing staff techniques which perceive people as the most important resource of any business.
- To understand how buying the right equipment in terms of size, price, availability of spare parts, and plan its maintenance permit the processor to save money.
- To recognize that exporting is not an easy thing and that many issues have to be considered before initiating this process.
- To learn that quality assurance has begun to focus not only on safety, which is expected, but also to increasingly higher demands for consistently better quality.

To this end, the conceptual content of this module has been organized into five units:

- **Unit 1** – *Managing finance in small-scale agro-industries.*
- **Unit 2** – *Managing people in small-scale agro-industries.*
- **Unit 3** – *Managing equipment in small-scale agro-industries.*
- **Unit 4** – *Managing exports in small-scale agro-industries.*
- **Unit 5** – *Quality assurance and management in small-scale agro-industries.*

In terms of **methodology**, the units are organized in such a way as to give you the opportunity to discover each unit's specific course content and the skills you will attain. Included in the conceptual content of this module are a few **procedures and attitudes** that will help you to make the most of what you learn and to apply it to the day-to-day reality of your agribusiness.

Each unit is structured to help you to identify in advance your prior experience and interests and to enable you to combine your existing knowledge with the proposed course content to optimum effect. The aim is to build capacities by accumulating new knowledge in a pro-active and participative way.

In terms of **assessment**, we start from the principle that assessment is of most value when it is used to take decisions for improving the teaching/learning process. With this in mind, we have included three phases:

- **Initial assessment:** this will enable facilitators or tutors to analyse and predict your real capacity for learning. At the same time, it will give you an idea of what each unit is about and what it aims to achieve in terms of increasing your motivation, updating your existing knowledge and preconceptions, and planning your own learning process fully.
- **Formative assessment:** this will enable facilitators to take decisions to improve the teaching/learning process (regulation) and will enable you to take decisions to improve your own learning process (self-regulation).
- **Summary assessment:** this will enable you to link together the key ideas, to find out what progress you have achieved and to see where you stand as regards a new learning process.

Furthermore, the assessment instruments in this manual can be supplemented with any others that facilitators may consider appropriate to ensure that assessment also becomes a group process and that progress is made with the different types of course content (concepts, procedures and attitudes). At the same time, the assessment instruments are designed to allow you to offer your constructive critical assessment of the validity of the course material and the way in which it is taught.

Accordingly, the manual contains the following sections:

Section	Aim
➤ General guidelines	Promote the learning-to-learn process
➤ List of topics	To present the specific content of each unit
➤ Points to remember	To memorize what you have learned. Initial assessment
➤ Key competencies	To detail the key competencies you will learn
➤ Setting the context	To put into context the subject to be discussed, and update thinking on it
➤ Case study	To remember prior knowledge. Initial and formative assessment
➤ Explaining key issues	To present the priority course content and analyse it in detail
➤ Conclusions on the case study	To provoke thought on the real issues. Formative assessment
➤ Practice exercises	To put into practice the proposed course content
➤ Unit assessment	To provide an opportunity for self-assessment of the material learnt
➤ Summary	To help to link, integrate and memorize the key ideas
➤ Glossary	To clarify ideas on the meaning of selected terms and acronyms
➤ Bibliography	To provide information for personal research

Particular attention is drawn to the glossary, which helps to clarify a few concepts not explained in the text. The terms figuring in the glossary are marked with an asterisk (*) the first time they appear in the text.

General study guidelines

To help you make optimum use of this material, below are a few hints and suggestions for planning and managing your own learning process:

- Organize your time in such a way as to allow you to complete the proposed assignments by the appointed deadline. You are advised to study for at least two hours every day to optimize the teaching/learning process.
- Before starting work on a unit, try to remember what you already know about the subject, as this will help you to link new knowledge with your existing knowledge and will allow you to recognize the added value of everything you learn for your personal development.
- Complete the self-assessments, as well as the topics and proposed case studies, as they will help you to understand the course material and reinforce your learning.
- You may underline, construct graphic organizers, write summaries or use any other method to help you to understand the course material fully.
- You will get a chance to ask questions and request clarifications to enable you to exchange views with your fellow students and with the facilitator. An opportunity will be provided for airing different points of view. The aim is not for us all to think exactly the same.
- Do your own research. The proposed bibliography is only a guide. Do not forget that you can also find instant, up-to-date information on the Internet.
- Use the objectives and competencies of each unit to develop your own assessment instruments. Taking control of your own learning process will allow you to make decisions to improve it.
- Although studying is challenging and you will come across obstacles, in the end all the effort, sacrifice and time will be rewarded with greater knowledge and enhanced skills, aptitudes and abilities.
- As you are the key player in the teaching/learning process, you will need sound arguments and in-depth thinking to carry out the proposed activities, coupled with strong motivation and critical and analytical abilities.
- You will find the definitions for words marked with an asterisk (*) in the glossary.

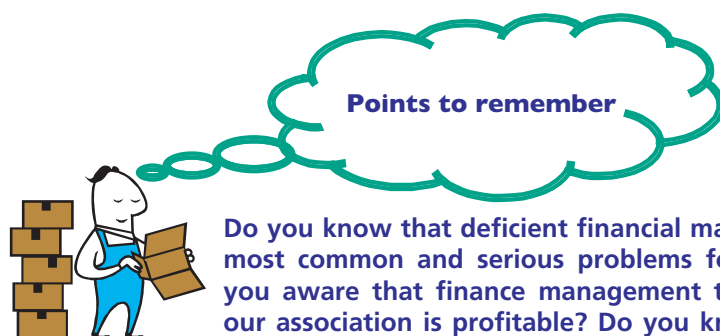
*You can do anything you set your mind to.
Get started now, and have fun.*

Managing finance in small-scale agro-industries

UNIT ONE

LIST OF TOPICS

1. Setting the context
2. Case study: Business Management –Situation of Cassava Starch and Panela Plants in North Cauca, Colombia
3. Case study analysis
4. Calculating costs
5. Calculating the price for products
6. Record keeping
7. Financial statements
8. Managing working capital
9. Conclusions on the case study
10. Group exercise
11. Summary
12. Unit assessment



Do you know that deficient financial management causes some of the most common and serious problems for small scale-processors? Are you aware that finance management techniques inform us whether our association is profitable? Do you know how to calculate the cost and price of your products? Is your enterprise keeping records of income and expenditure? Do you know why keeping records is important? Do you know what a break-even analysis is and what is the importance of it? Have you considered the importance of managing working capital?

Simple finance management techniques have been developed to help small entrepreneurs manage their business. These techniques will help the small-scale processor to calculate the costs of production that arise during operation of the agro industry and to determine income from the sale of the products.

**By the time you complete this unit
you will be able to:**

- ☞ Identify from your own experience finance management activities that your associative enterprise has implemented or should implement.
- ☞ Gauge the economic implications of poor finance managing.
- ☞ Learn to calculate costs, and determine the price for the products.
- ☞ Recognize the importance of record keeping and which records are necessary to keep.
- ☞ Appreciate the importance of managing working capital and break-even analysis.



Setting the context

Before the industrial revolution finance management was not considered so important for business organizations. Because methods of productions were very simple, labour was more important than capital and finance at that time. So these things did not create any problems.

Yet, after industrial revolution, when methods of productions were introduced, the finance got much importance. Nowadays finance management is considered as the life blood of every business and achieved the most important place in today's business. The businesses whether large-scale or small-scale require finance for its operations. Money is a universal lubricant for any enterprise, man and machine work.

Agro-industries as one very important industry branch and part of modern agrifood systems are characterized by their strong backward and forward linkages among agricultural enterprises, strong synergies between domestic and export sectors, and perhaps most importantly high production and service value addition relative to primary production.

As any other business, agro-industries good performance depends on a number of parameters in order to be profitable. These parameters are related to production

and finance management. Deficient financial management causes some of the most common and serious problems for many small-scale processors. Causes of failure include:

- over-spending;
- treating profits as personal income;
- incorrect costing of inputs and/or pricing of products;
- poor record keeping;
- high debts or negative cash flow*.

Finance management techniques help us know if the enterprise is really winning or how profitable a new business can be. In this context there are two types of finance needed. The first is required before a business is set up and while the processing unit is being established. This is known as investment* finance. The second type is required to meet the costs that arise during operation of the processing unit, and this is met by income from sales of products. In this course we will treat the second type related to routine financial management.

Case study: Business Management - Situation of Cassava Starch and Panela Plants in North Cauca, Colombia

INTRODUCTION¹

Two types of rural agro-industries are typically found in the Department of North Cauca, Colombia: small sugar-crushing plants, which produce panela*, and cassava- processing plants, which produce both sour and sweet starch. Panela plants are generally too small, dispersed and seasonal in operation to estimate the number of families dependent on them as a major source of income. However, most of the starch plants are small family enterprises, which provide direct employment to approximately 300 families.

It is estimated that 80 percent of sour starch production in Colombia is concentrated in North Cauca and that 90 percent of the 60 000 tonnes/year of cassava roots produced in the region are processed into starch. Although many institutions, public and private, have worked on various fronts with these small agro-enterprises, their impact was unknown as was the degree to which new technology had been adopted. Also, a comprehensive understanding of the principal problems of these agro-industries was not available to formulate effective support programs.

DISCUSSION

Taking into consideration the above, the Carvajal Foundation and CORPOTUNIA planned a study focused on gathering and analyzing the needed information. Other institutions with a particular interest in the information gathering exercise and who participated in various ways were CIAT, CIRAD-SAR, the Corporation for Interdisciplinary Studies and Technical Assistance (CETEC), PRODAR, and IDRC.

The objectives of the study included better knowledge of the management and administration of panela and cassava starch enterprises as a basis on which to formulate strategies for strengthening their administrative structures and business consolidation. To achieve this purpose, various aspects of enterprise management were addressed, such as personnel management, accounting practices and inventory* control, costs of production and sales, product marketing* and prices, quality control, and legal aspects and administrative structure.

The researchers began by conducting a thorough review of secondary information about the starch plants followed by each participating institution compiling a matrix

¹ IDRC-CRDI. 1997. Rural Agro-industry in Latin America. An evaluation of the PRODAR Network. http://www.idrc.ca/fr/ev-31725-201-1-DO_TOPIC.html

of information they possessed not already captured. Based on this information, a field instrument was designed; pilot tested and administered to starch and panela plant operators. When the fieldwork was completed, the data was coded, organized and analysed by a selected inter-institutional team of analysts.

CONCLUSION

The results of the study may be summarized as follows: Of the 210 starch plants inventoried, 146 were in operation, three were under construction, 30 were temporarily idle, and 28 were abandoned. Most were family operations, and two were owned by organizations. Twelve percent of the work force are women, and less than one percent are children. Lack of working capital, shortage of raw material, great variation in price and marketing of products and by-products were the main reasons indicated for a 68 percent underutilization of installed capacity. Other problems included scarcity of water, lack of drying floors and frequent cuts in electric energy supply.

About 22 percent of the plants had received some administrative training and 77 percent of these kept a register of their purchases and sales. The plants with higher technology levels usually kept records while the oldest and most experienced operators were least likely to do so.

Turning to the results of the panela plant survey it is estimated that, in 1990, about 900 000 tonnes of panela was produced in Colombia in 30 000 plants generating 120 000 permanent jobs. Of the 60 plants surveyed, 89 percent were in operation and the rest either lacked cane to process or were abandoned. Seventeen percent of the plants belong to producer associations and the rest to individuals or family groups. Up to five women were found working in 78 percent of the plants. Less than half had completed primary education. Administratively, 94 percent of the plants had minimal or no administrative and management structure or distribution of tasks among workers and only 5 percent kept inventories. Most did not know what their costs of production and returns were.

In general, comparing panela and starch plants, the panela plants are family enterprises with little working capital and poor or nonexistent administration. Most are ignorant about determining costs of production, do not keep records and have no idea of their costs and returns. The starch producers, on the other hand, are generally better endowed in these enterprise areas. Women's labour, and in some cases that of children, is an important factor in both types of enterprise but especially in panela where returns are lower. Those who belonged to grouping organizations exhibited better management practices and both technical and management training appeared as an important tool in improving these small enterprises. These administrative factors left them at a disadvantage in negotiating with intermediaries who set prices at will.

Case study analysis

Based on your personal experience, consider the following questions on the proposed case:

1. According to the case study which are the main problems of panela* and starch plants in Colombia? Which of these problems related to the lack of money or to scarce financial management? Explain.
2. In your opinion, why do you think that most of the studied enterprises do not keep records of costs of production and have no idea of their costs and returns? How do you think these practices affect the business?
3. In your opinion and according to the case, which are the principal management finance practices that starch and panela enterprises are not following?
4. What should be the attitude of the panela and cassava enterprise owners who are being included in training and enterprise development projects in order to improve their administrative skills?

Bear in mind that at the end of the unit you will be asked to answer the same questions in the light of the new knowledge you will have acquired.

Calculating costs

The first step to introduce finance management is calculating costs. Many small-scale processors do not attempt to find out what their production costs are, because they believe that it is too complicated or too difficult. As a result they have no idea whether they are making a profit or how much it is. However, when the different costs in a business are understood, it is a relatively straightforward procedure to calculate them.

The costs incurred before production begins are known as ‘start-up’ costs. The costs of buildings, machinery and other equipment are known as ‘capital costs’, and the costs that arise during processing and selling the products are ‘operating costs’.

Operating costs are categorized into two types: ‘fixed’ and ‘variable’. Fixed costs* (also known as ‘overheads’) are those that do not change if there is an increase or decrease in the amount of production. Examples include:

- salaries;
- rent;
- utilities (service charges for telephone, water and electricity);
- interest paid on loans;
- some types of taxes;
- depreciation* of equipment.

Variable costs* change according to the volume of production. Examples include:

- raw materials and ingredients;
- packaging materials;
- salaries for operational staff;
- electricity, gas and water charges;
- fuel for vehicles;
- office materials.

Operating costs can also be described as ‘direct’ and ‘indirect’ costs. Direct costs are those that arise directly from the production process (e.g. materials and labour costs for production workers), whereas indirect costs include salaries for office staff and delivery drivers, vehicle costs, etc.

Where the time and materials required to produce and sell different products are similar, it may be reasonable to split indirect costs equally between them. If however, the overheads for one product are higher, or the production and sales are more diverse and complex, or the competition is stronger, it may be beneficial to use ‘activity-based costing’. This more accurately assesses the true level of indirect costs and involves identifying all of the indirect activities needed to make and sell each product and allocates an accurate cost for each. These costs are then added together.

The calculations can also show which products are the most profitable and how expansion of their production would benefit the business. For a business to operate successfully, it must be profitable over the long term. This means that the income must be greater than the total expenditure.

Gross profit = income – expenditure before taxes are paid

There are two basic ways to maximize gross profits. The first is to reduce expenditure, and to do this a processor must first identify where costs occur in the business. The second is to increase income, either by increasing the price of products, increasing sales of products, or by finding buyers for by-products that were previously discarded.

Calculating the price for products

The price charged for a product should ensure that the income meets all of the costs and generates sufficient profit. The simplest method to determine the correct price for a product is to add up all the costs of production and then add on a percentage profit (mark-up pricing). Profit margins of 20–30 percent are possible, although many processors achieve less. Conversely, if a product has little competition and/or a high demand*, a higher profit margin may be possible.

Example: Calculating the price of a product

Total production costs per kg cheese = US\$4.44

Add 23 percent profit margin = US\$1.02

Selling price (US\$/kg) = US\$4.44 + US\$1.02 = US\$5.46/kg

This pricing strategy does not include the capital costs of the equipment used nor does it allow for the fact that the price of a product depends largely on what the market will accept and the price that competitors are charging. A judgment must therefore be made about how much a product can be sold for in a particular market and whether the costs of making it will produce an acceptable profit.

The following principles assist in setting a price:

- a. produce products for which there is a strong demand;
- b. be aware of current market prices and conditions and how these translate into product prices;

- c. know the break-even cost of production and marketing.

The following formula provides a more complex calculation of selling price that relates production costs, invested capital, the amount of food sold and profit required:

$$\text{Selling price: } P = v + F/Q + r K/Q$$

where P = selling price ; v = unit variable cost of the product; F = fixed costs; Q = quantity produced and sold; r = interest rate; K= invested capital

Some processors underestimate the importance of price setting and simply try to undercut their competitors. However, prices that are too low make little or no profit, and poor pricing can result in no money being available for effective marketing.

Record keeping

To manage finances successfully, processors must have a good idea of how cash comes into a business, where it is at any time and where it goes. This requires financial records. Processing enterprises at all scales of operation need to keep financial records in order to know how much income from sales has been received, how much has been spent and for what purpose. Depending on the size and type of business, processors may also keep records of production, stocks*, sales, staff, equipment maintenance, quality assurance and cleaning schedules. Copies of all records should be made, usually by using carbon paper under the page of a duplicate record book.

The benefits of keeping records include:

- being able to analyse business finances to reduce costs;
- knowing how much profit/loss is made and whether a product range should be expanded or reduced;
- conforming to tax laws;
- knowing which customers* owe money and how much;
- knowing who are the creditors of the business;
- detecting fraud or theft.

The following are the most common records used in different businesses.

Records of income

When a customer buys products on credit (i.e. they do not pay immediately), the processor should give an invoice* that has an individual number, the customer's name, the products that were bought and how much is owed.

Example of a page from an invoice book

INVOICE No. Date:

To:

Address:

Order No. :

Quantity	Products	US\$
.....

Please settle this account within 30 days.

Signed

Manager

A delivery note signed by the customer can also be used to prove that items have been delivered in good condition. When the customer pays the bill, a receipt* should be issued.

Example of a page from a receipt book

RECEIPT No.: Date:
 Address:
 Received from:
 The sum of US\$:
 Being payment for:
 US\$ Cash: Check No.
 Signed:
 Manager

A **cashbook** is used to record all transactions that are made in cash.

Example of a page from a cashbook

Cash income				Cash expenditure			
Date	Amount received	Customer	Products sold	Date	Amount spent	Seller	Materials bought
2.6.05	24.50	JC Stores	Pineapple juice				
				3.6.03	2.56	Mohammed stationery	Paper
6.6.05	12.00	Star shop	Tomato sauce	6.6.03	10.45	Market	Plastic bags

Records of expenditure

Order* books have an individual number for each purchase, and together with cashbooks are used to record all expenditure made by the processing company. When goods have been paid for, the receipts should be kept in date order in a separate file.

Records of purchases taken from the cash and order books are compiled each week or month and entered into an expenditure book to show how much money the processor has spent on materials, services or salaries.

Example of a page from an order book

Order No.: Date:
 To:
 Address:

Please supply the following items and charge our account, quoting our order number in your invoice.

Amount	Goods	Cost (US\$)
.....

Signed:
 Manager

Record keeping in micro- and small-scale enterprises often involves a simple single-entry recording system. This is based on a sales and expenditure book in which the date of a transaction, its nature, and the amount of money involved are recorded in different columns. Larger businesses use a double-entry system as described above.

Example of a page from an expenditure book

Expenditure for the year: 2003

Month: May

Amount: US\$

Date	Order No.	Check No.	Cash	Raw material	Ingredient	Office materials	Vehicle	Staff costs	Miscellaneous*
2.5.03	00232	00394				21.30			
2.5.03	00233		10.25					10.25	
15.5.03								15.00	

* Miscellaneous entries can include purchases that are made infrequently, such as machinery, office furniture etc.

Financial statements

Other financial statements used in a business include:

- bank statements to show bank account transactions;

- balance sheet statements, which show the financial position at a particular time;
- cash flow statements, which show the increase or decrease in available cash at a particular time;
- profit and loss accounts;
- break-even analysis.

The financial position of a business is presented in a balance sheet and the operating results are displayed in a profit and loss statement. These financial statements show the past performance of the business and are used to project what might happen in the future.

There are two categories of accounting information:

- ✓ financial accounting for the public, shareholders, customers, suppliers, creditors, regulatory bodies or tax authorities which includes the financial position, liquidity and profitability* of an enterprise;
- ✓ managerial accounting for internal use within the business which this includes the relationship between production costs, profits and sales volumes, productivity*, pricing decisions, capital budgets, etc.

A balance sheet shows the company's value, providing information about its assets, liabilities, and owners' equity* at a particular time. Assets can be current assets (those that the owner could convert into cash) and include products in stock, cash and any short-term investments; or fixed assets. These include land, buildings, machinery, vehicles, furniture, and fixtures. They also include patents and trademarks.

Example of balance sheet

Assets	Amount (US\$)	Liabilities (US\$)	Amount (US\$)
Cash		Creditors	
Debtors		Loan	
Stocks		Dividends	
Machinery		Taxes owed	
Less:			
prepaid expenses			
Total assets			
Total liabilities			

Liabilities are obligations to others, including creditors and employees. Current liabilities are those that the owner expects to pay within a short time, including salaries, taxes, short-term loans and money owed to suppliers. Long-

term liabilities are debts such as long-term loans. When a business is operated by a single owner or as a partnership, the balance sheet may show the amount of each owner's equity. When shareholders own the business, the balance sheet shows the amount originally invested by the shareholders, and the amount reinvested from income (i.e. retained earnings that are not distributed to shareholders as dividends).

A cash flow statement shows the movement of money in and out of a business. It is the cycle of cash inflows and outflows that determine a business' solvency.

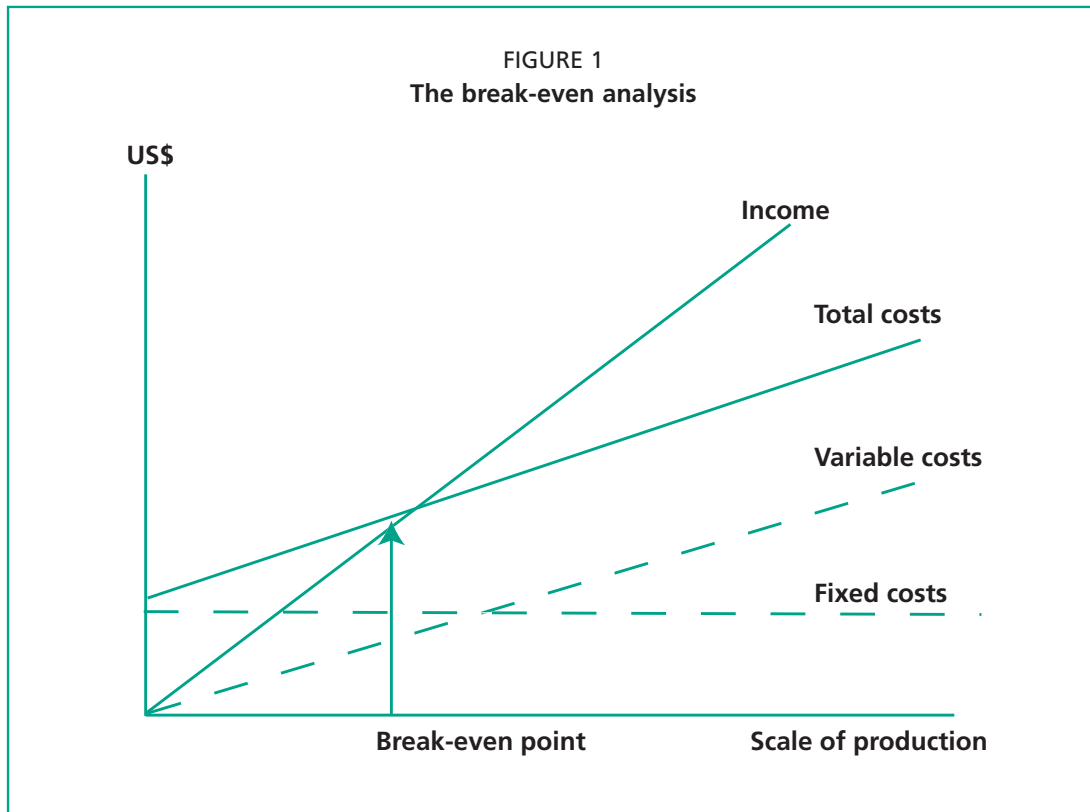
Example of a cash flow statement

Month	1	2	3	4	5
Cash inflow					
Balance b/f*		(350)	(200)	400	550
Sales		2 000	2 350	1 800	2 000
Equity	2 500				
Total income	2 500	1 650	2 150	2 200	2 550
Cash outflow					
Investment					
Expenditure	1000				
Rent	950	950	950	950	950
Labour	200	200	200	200	200
Stock	200	200	200	200	200
Total	500	500	400	300	200
Expenditure	2 850	1 850	1 750	1 650	1 550
Net cash flow	(350)	(200)	400	550	1 000

*b/f = brought forward

A break-even analysis (Figure 1) is used to determine the production level at which revenues* are equal to the costs incurred. i.e. the business is neither making a profit nor loss. The level of production should always be above this level to ensure that the business is profitable.

$$\text{Break-even point* (no. of units)} = \frac{\text{Total fixed costs}}{\text{Unit selling price} - \text{Unit variable costs}}$$



Example: Calculating the break-even point

A business sells a pack of bacon for US\$4.95 and the total fixed costs are calculated at US\$260 per day. The unit variable cost is US\$2.65 per pack. The break-even point = $\text{US\$}260/\text{day} / (\text{US\$}4.95/\text{pack} - \text{US\$}2.65/\text{pack}) = 113$ packs per day. The maximum bacon production level is 350 packs per day, and the break-even point expressed as a percentage of the volume of production is therefore = $(113/350) \times 100 = 32$ percent.

Managing working capital

Many small businesses concentrate on maximizing profits by increasing sales and reducing production costs and overheads. However, too few companies consider the importance of managing working capital. This can make the difference between business survival and failure. Many profitable processors fail because they are not able to pay the bills. Working Capital (or 'net current assets') includes:

- stocks of raw materials, part-processed foods and finished products awaiting sale;
- amounts owed to the business by customers for sales made on credit;
- cash in the bank.

Strategies to improve working capital include:

- increase credit lines with suppliers i.e. amounts owed by the business to suppliers of raw materials and services;
- set budgets and monitor actual expenditure against them;
- control stock levels and minimize the amounts of materials held as stock;
- check the credit worthiness of customers and improve credit control methods e.g. follow up debtors* regularly to shorten payment times and restrict the amount of credit that is offered to customers.

Conclusions on the case study

Having compared your prior knowledge with the subject content of the unit, answer the following questions making optimum use of the new knowledge you have acquired.

1. According to the case study which are the main problems of panela and starch plants in Colombia? Are most of these problems related to the lack of money or to scarce financial management? Explain your answer.

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2. In your opinion, why do you think that most of the studied enterprises don't keep records of costs of production and have no idea of their costs and returns? How do you think these practices affect the business?

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3. In your opinion and according to the case, which are the principal management finance practices that starch and panela enterprises are not following?

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4. What should be the attitude of the panela and cassava enterprise owners who are being included in training and enterprise development projects in order to improve their administrative skills?

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Group exercise

As you remember Chiang Mai Agribusiness sells fresh broccoli to several supermarket chains. Now, this enterprise is looking forward to produce chilled broccoli for export markets.

- a. Calculate the direct costs of one kilogram of fresh broccoli using the following table and information. Consider that the Cooperative has four workers and one supervisor. The working week is 48 hours and processing takes place for 45 weeks per year. 200 kg of chilled broccoli is produced in an average 8-hour day.

Direct costs	Calculation	US\$
Salaries for 4 workers (US\$75 per month each)		
Salary for one supervisor (US\$120 per month)		
Total salary cost (4 worker salaries + supervisor salary)		
Number of hours worked per year		
Labour cost per hour		
Direct labour cost per kg chilled broccoli		
Direct material costs (broccoli and packaging = US\$20 per day). Therefore direct fuel/power costs per kg chilled broccoli.		
Direct power costs per day are US\$20. Therefore direct fuel/ power costs per kg broccoli		
Total direct costs per kg cheese		

- b. Calculate the indirect costs and the total cost of producing chilled broccoli (US\$/kg). Use the following table and consider this information:
- Rent for dairy = US\$750 per year
 - Telephone = an average of US\$40 per month
 - Utilities = US\$ per month
 - Delivery vehicle = US\$95 per month
 - Maintenance and depreciation = US\$29 per month
 - Interest on loan = US\$14 per month
 - Taxes = US\$720 per year

Indirect costs	Calculation	US\$
Total indirect costs per day (US\$)		
Total indirect costs per kg chilled broccoli		
Total fixed costs per kg broccoli (Labour and indirect costs)		
Total variable costs per kg broccoli (Materials and power costs)		
Total cost of producing chilled broccoli (US\$/kg)		

Summary

- The first step to introduce finance management is calculating costs.
- Operating costs are categorized into two types: ‘fixed’ and ‘variable’.
- Fixed costs (also known as ‘overheads’) are those that do not change if there is an increase or decrease in the amount of production.
- Variable costs change according to the volume of production. Examples include:
 - Operating costs can also be described as ‘direct’ and ‘indirect’ costs.
 - For a business to operate successfully, it must be profitable over the long term. This means that the income must be greater than the total expenditure.
 - There are two basic ways to maximize gross profits. The first is to reduce expenditure, and to do this a processor must first identify where costs occur in the business.
 - The simplest method to determine the correct price for a product is to add up all the costs of production and then add on a percentage profit (markup pricing).
 - To manage finances successfully, processors must have a good idea of how cash comes into a business, where it is at any time and where it goes. This requires financial records.
 - The most common records are: records of income, and records of expenditure.
 - Financial statements used in a business include: bank statements, balance sheet statements, cash flow statements, profit and loss accounts and break-even analysis.
 - Working Capital (or ‘net current assets’) includes: stocks of raw materials, part-processed foods and finished products awaiting sale; amounts owed to the business by customers for sales made on credit; cash in the bank.

Unit assessment

Answer the following questions on additional sheets of paper:

1. What is the real importance of finance management? Mention some causes of failure related to deficient management.

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2. Do you know if your association is really profitable? How do you calculate costs of your products and how do you determine their prices?

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3. Which finance management techniques does your association use?

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4. What is the importance of keeping records in an enterprise? Which records are kept by your enterprise?

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If when attempting to answer these questions you have any doubts or feel that you do not have sufficient information for the analysis, take another look at the manual, consult the student's handbook or contact the facilitator.

Managing people in small-scale agro-industries

UNIT TWO

LIST OF TOPICS

1. Setting the context
2. Case study: An Asian food processing firm faces new challenges in Kenya
3. Case study analysis
4. Recruitment
5. Training and staff motivation
6. Staff management
7. Health and safety
8. Staff records
9. Conclusions on the case study
10. Group exercise
11. Summary
12. Unit assessment

Points to remember



Do you know why of all different resources of a small scale-enterprise, staff is the most important? Are you aware that training and staff motivation are essential for the proper performance of the business? Do you know which some of the modern staff management techniques are? Is your enterprise keeping records on employees and their jobs? Do you know that the cost of preventing illness or injuries at work are smaller than the cost of damage to equipment, medical or legal fees, increased insurance premiums among other things?

Nowadays modern managing staff techniques have been developed, and include different measures such as involving employees in business decisions, relating pay to an employee's performance, and motivating and training staff to achieve their performance.

**By the time you complete this unit
you will be able to:**

- 🔗 Identify from your own experience staff management activities that your association has implemented or should implement.
- 🔗 Gauge the economic implications of not preventing illness or injuries of staff at work.
- 🔗 Learn to recruit people and to prepare a job description for each job.
- 🔗 Recognize the importance of training and staff motivation.
- 🔗 Appreciate the importance of staff management new techniques.



Setting the context

Of all the different resources needed to operate a small processing enterprise, the staff are the most important because they have unlimited potential if they are properly trained, managed and motivated. However, owners of small businesses frequently overlook this and they recruit friends, relations or neighbours to work in the business.

This may be because owners feel that these people are more trustworthy, but they may not have the best skills for the jobs that need doing. Likewise, many small business owners refuse to train their staff because they think that a more skilled worker will ask for higher pay, or they will be tempted away by a competitor. Both attitudes are short-sighted, and the correct selection of staff and investment* in their development are keys to the success of a small processing business.

Human resource planning or staff planning refers to methods used to decide the numbers and types of staff that are needed to run a processing enterprise. This is first based on the intended production volumes and an assessment of which parts of the process are mechanized and which require manual operation. A processor can use the same methods to decide when it is time to bring in more workers by analysing the workloads of existing workers and comparing them to new production targets.

The numbers of staff required for other types of work, including sales, deliveries to retailers, accounts or record keeping and quality assurance are then considered. A convenient way of planning this is to draw an activity chart, which shows the type of work to be done, the number of people involved and the sequence of work that individuals do during the day.

When the total number of employees has been decided, the business owner should then set about recruiting, training and managing suitable staff in a systematic way. This requires the owner to develop policies and employment conditions that attract and keep competent staff.

Case study: An Asian food processing firm faces new challenges in Kenya

INTRODUCTION

Competition has become much more intense in the last ten years in Kenya; with no less than nine local firms competing in some of the same lines where earlier there was a virtual monopoly.

In addition there has been an increase in imports of certain food lines from Europe and even from food diverted from emergency aid. And there has been the new freedom from competitors to import directly from the Middle East, South Africa and Europe. In total, this new competitive environment has actually resulted in the closure of one entire factory and the sale of another.

DISCUSSION

These pressures have been very intense in the last three years, and have reduced the workforce in this food-processing firm from some 500 to 250 in that period; and retrenchment is expected to continue. All the usual elements have been outsourced to reduce administrative costs. And there is even talk of outsourcing accounts, but not the sales department. The skills profile of employees includes 50 percent unskilled (including casuals); 20 percent semi-skilled; 20 percent skilled (mechanics and technicians); and 10 percent supervisory and management.

CONCLUSION

Training has taken a series of cuts along lines with which we are becoming familiar. In the late 1990s, apprentices that were linked to long term training in polytechnics and universities were stopped and, instead, qualified and experienced recruits were selected in the market which is allegedly flooded with young people looking for jobs.

External, full time training has been cut, and has been replaced by internal training, supplemented by the use of training videos. The levy-grant system continues to operate, but with the reduction in long term apprentice and other training there are no longer any refunds.

¹ ITC-ILO. 2002. Enterprise-based training in Africa. Case studies from Kenya and Zambia. Turin, Italy. <http://www.itcilo.org/spanish/bureau/turin/whatisnew/flyers/EBT%20in%20Kenya%20and%20Zambia.pdf>

Case study analysis

Based on your personal experience, consider the following questions on the proposed case:

1. What have been the implications of liberalisation, more imports, and greater global competition on the workforce in the firm? Has this happened in your business?

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2. What measures have been taken that directly affect the workforce? How do you think these measures affect staff’s motivation?

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3. How is this agro-industry handling training? In your opinion what are the strengths and weaknesses of this model?

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4. What does the future perspective look like for this agro-industry?

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Bear in mind that at the end of the unit you will be asked to answer the same questions in the light of the new knowledge you will have acquired.

Recruitment

Before starting to recruit new staff, it is important that the processor prepares a job description for each job. This helps in deciding exactly what type of work the new person will be expected to do, and what skills, qualifications or experience are needed to do the job. This can be written simply as a 'person profile'.

Example of a person profile used in recruitment* of new staff

Person Profile

Date:

Job: Sales Assistant

Essential requirements:

- education to Standard 6;
- good arithmetic skills (without calculator);
- friendly disposition and good communicator.

Desirable requirements:

- two years' experience in retail sales;
- flexibility in working hours.

Jobs are then advertised in newspapers, radio, by public notices, by recommendation of friends or through other employees. The owner then compares applications with the criteria in the person profile and selects potentially suitable people for interview. Business owners should also operate a policy of not discriminating against applicants because of their sex, religion, race or age. Interviews are useful for a number of reasons: they help show the personality, communication skills and any hidden abilities of the applicant; they can be used to reveal decision-making or technical skills; and they give the applicant a chance to understand the job and what will be required of them.

After an applicant has been selected, a letter should be sent, confirming the appointment and when the person should start work. The new employee should be given an employment contract, containing the job description and details of the salary and other benefits (e.g. holidays, assistance with transport to work, etc.). For most countries, the law requires a medical examination for workers who handle foods to ensure that they have no illness that could be passed on to consumers* and cause food poisoning.

Training and staff motivation

It is important to introduce new employees to the business, so that they get to know the workplace and other staff, and quickly become productive. This can either be done formally using an induction course, or less formally by a supervisor or owner taking them around the factory to introduce them to fellow workers and to explain the work. New staff should also be given any company literature such as promotion* leaflets or advertisements, and samples of products.

Many small-scale processors prefer to recruit staff that are relatively inexperienced, and then train them in the particular methods that are used in their process. They believe that this is not only cheaper (because inexperienced workers are paid a lower salary than experienced ones), but also because they can be trained from the beginning to do their job in the way that the owner wants it to be done. However, it is important that training is planned, so that the correct skills, attitudes and techniques are built up in a systematic way.

‘On the job’ training is popular with small-scale processors because new employees are working and producing products while they are being trained by more experienced staff. Specialist courses are available from college or university departments and from some international development agencies. There are often subsidies or grants available to small enterprises from government institutions or development agencies for training and staff development*.

A characteristic of successful businesses of any size is that they have workers who are willing to work for the company because they feel that they have a future with it – in other words the staff is motivated. As a minimum, the owner should ensure that the staff is reasonably paid, their salaries are paid on time, and that there are good working conditions.

However, an even more important motivating factor is that staff can see what their part is in the business, and how their own individual activities can help the enterprise achieve success. When staff is supported in their work by the enterprise owner, they are more likely to be motivated and improve their productivity. Other benefits that keep workers motivated include:

- housing, travel or medical allowances;
- a contribution to the cost of educating their children or medical bills;
- subsidized meals or the ability to buy products at a reduced cost;
- reasonable working hours with time off to attend special family occasions or visit health centres.

Staff management

The relationship between the owner and workers in micro- and small-scale businesses is frequently based on instruction and command, with the managers having an authoritarian role within a defined hierarchy. Union membership is uncommon and individual employees are notified of their salaries and working conditions by the owner or manager. More recent management methods are more participative and open. The aim is to promote cooperative relations between the management and staff and to avoid the often adversarial behaviour in traditional industrial relations. If successful, employees become more committed to their long-term future with the business. Modern staff management requires different measures including:

- involving employees in business decisions;
- relating pay to an employee's performance;
- carefully recruiting and training, as well as fair treatment;
- integrating staff management policies with other policies such as production, marketing, and sales.

Good management involves motivating staff to achieve their best performance. This means giving employees a clear understanding of the aims of the business and how each person can help to achieve company goals. Providing necessary tools, skills and working conditions and resources to enable workers to do their jobs properly is also essential. The owner can do this by setting clear targets for the amount of work and the quality standards that employees are expected to achieve, by assessing performance fairly, by giving constructive criticism when improvements are needed, and by rewarding successful employees with increased responsibilities.

Some tips on good management style are:

- involve staff in decisions on any changes to their work and consult regularly with them;
- enforce discipline firmly but fairly;
- set achievable deadlines or targets, and check on progress regularly;
- give credit for initiative and intelligence, and show appreciation for a job that is well done;
- discuss weaknesses with individual staff members and make suggestions on how to improve.

Relating pay to performance is another way of motivating people. Although some small-scale businesses offer overtime payments or pay staff on a piecework basis (i.e. workers are paid per pack of food produced), more commonly it is a fixed rate of pay for a particular job. In newer management methods, the pay varies according to an individual's performance and/or the profitability of the business. This involves a regular appraisal of each employee's performance and development of a clear profit-sharing scheme. Everyone should know how he or she would benefit from bonus pay arising from an improvement in the performance of the business. An alternative for limited companies is to offer employees shares in the company, which should be held for several years.

These help bind the staff to the long-term development of the company. Both profit sharing and employee share schemes mean that the workers are also sharing some of the risks in the operation of the company with its owner. Modern staff management methods are also known as human resource management (HRM). Methods aim to employ people who can operate flexibly and adapt to different jobs or changing work arrangements, instead of having rigidly defined job descriptions. Also in larger businesses, employee relations become the responsibility of all managers, not just personnel managers. Personnel matters are usually integrated with other areas of the company, including marketing, sales, production and others.

Experience has shown that businesses with modern staff management methods have higher productivity than those with authoritarian-style staff management.

Health and safety

All processors have a responsibility to provide safe and healthy working conditions for their staff to prevent illness or injuries at work. This is a legal responsibility in some countries, but even if laws do not exist, it is in the processor's interest to avoid accidents or poor working conditions. The costs of prevention are smaller than the cost of damage to equipment, medical or legal fees, increased insurance premiums, or losing skilled staff due to permanent disability arising from injuries. Also, a safe and healthy working environment enhances the public image of the business. The main dangers in food processing are burns from equipment operated at high temperatures, cuts from moving blades, injuries caused by powered machinery, and an unhealthy environment caused by dust, fumes or smoke.

Part of an owner's responsibility is to ensure that machinery operates safely and that guards are in place, equipment is regularly maintained, and that staff are properly trained in its use.

Staff records

Different types of records are needed to keep information on employees and their jobs. Personnel files are records of the performance of individual employees at work, their salaries, promotions, holidays, correspondences from labour ministries or income tax offices, P.A.Y.E contributions, etc. Register books are used in some larger businesses to record attendance and time keeping, but these are rarely needed for small-scale operations.

Conclusions on the case study

Having compared your prior knowledge with the subject content of the unit, answer the following questions making optimum use of the new knowledge you have acquired.

1. What have been the implications of liberalisation, more imports, and greater global competition on the workforce in the firm? Has something similar happened in your business?

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2. What measures have been taken that directly affect the workforce? How do you think these measures affect staff motivation?

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3. How is this agro-industry handling training? In your opinion what are the strengths and weaknesses of this model?

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4. What does the future perspective look like for this agro-industry?

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Group exercise

We return to the example of the Chiang Mai Agribusiness in Module No 3.

Now the agro industry is expanding and therefore looking to hire new staff for the chilled broccoli processing plant.

1. Elaborate person profiles for recruitment of the following staff:
 - a. One plant supervisor
 - b. One quality assurance supervisor
 - c. One worker related to cleaning facilities
 - d. One worker for the raw material reception

Use the proposed format.

2. What will be the principal themes that a training manual for new workers (in processing areas) in a chilled broccoli plant should have? Elaborate a table of contents for the manual.
3. Mention at least four measures that should be taken in order to prevent accidents in the processing areas.

Summary

- Staff are the most important resources needed to operate a small processing enterprise, because they have unlimited potential if they are properly trained, managed and motivated.
- Before starting to recruit new staff, it is important that the processor prepares a job description for each job. This can be written simply as a 'person profile'.
- Jobs are then advertised in newspapers, radio, by public notices, by recommendation of friends or through other employees. The owner then

compares applications with the criteria in the person profile and selects potentially suitable people for interview.

- After an applicant has been selected, a letter should be sent, confirming the appointment and when the person should start work. The new employee should be given an employment contract, containing the job description and details of the salary and other benefits (e.g. holidays, assistance with transport to work etc.).
- It is important to introduce new employees to the business, so that they get to know the workplace and other staff, and quickly become productive. New staff should also be given any company literature such as promotion leaflets or advertisements, and samples of products.
- A characteristic of successful businesses of any size is that they have workers who are willing to work for the company because they feel that they have a future with it – in other words the staff is motivated. As a minimum, the owner should ensure that staff is reasonably paid, their salaries are paid on time, and that there are good working conditions.
- When staff is supported in their work by the enterprise owner, they are more likely to be motivated and improve their productivity.
- More recent management methods are more participative and open. The aim is to promote cooperative relations between the management and staff and to avoid the often adversarial behaviour in traditional industrial relations.
- Providing necessary tools, skills and working conditions and resources to enable workers to do their jobs properly is also essential.
- Experience has shown that businesses with modern staff management methods have higher productivity than those with authoritarian-style staff management.
- All processors have a responsibility to provide safe and healthy working conditions for their staff to prevent illness or injuries at work. This is a legal responsibility in some countries, but even if laws do not exist, it is in the processor's interest to avoid accidents or poor working conditions.
- Different types of records are needed to keep information on employees and their jobs. Personnel files are records of the performance of individual employees at work, their salaries, promotions, holidays, correspondences from labour ministries or income tax offices, P.A.Y.E contributions, etc.

Unit assessment

Answer the following questions on additional sheets of paper:

- 1. In your opinion, why are human resources the most important resources in small scale processing enterprise? Which values should be prized in the people that work for your small-scale processing business?

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- 2. Explain what “recruitment” is, and the steps that should be taken in order to hire new personnel.

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- 3. Mention at least five benefits that may motivate workers, and explain how these may keep the staff encouraged.

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- 4. In your opinion and after reading this unit, explain the importance of providing safe and healthy conditions for the staff.

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If when attempting to answer these questions you have any doubts or feel that you do not have sufficient information for the analysis, take another look at the manual, consult the student’s handbook or contact the facilitator.

Managing equipment in small-scale agro-industries

UNIT THREE

LIST OF TOPICS

1. Setting the context
2. Case study: From Dairy Farming to Manufacturing: The Osia Ice Cream Company, Denmark
3. Case study analysis
4. Choosing equipment
5. Calculating the correct size of equipment
6. Sources of equipment
7. Equipment maintenance
8. Depreciation for equipment
9. Conclusions on the case study
10. Group exercise
11. Summary
12. Unit assessment



Points to remember

Do you know that proper maintenance ensures that machinery operates correctly, safely and for longer time? Are you aware that before buying equipment it is necessary to calculate the size required? Do you know what considerations should be taken in order to decide where to buy equipment? Is your enterprise planning the maintenance of its machinery? Do you know that equipment gradually wears out when it is used, and that depreciation method allows the processor to accumulate funds to buy a replacement?

Buying the right equipment in terms of size, price, availability of spare parts, and plan its maintenance permit the processor to save money.

**By the time you complete this unit
you will be able to:**

- 🌀 Identify from your own experience the challenges and opportunities in managing equipment.
- 🌀 Gauge the economic implications of having poorly maintained machines and equipment.
- 🌀 Learn to calculate the correct size of equipment before buying.
- 🌀 Recognize sources of equipment.
- 🌀 Appreciate the importance of planned maintenance* of equipment.



Setting the context

Poorly maintained machines are a potential hazard to operators; they produce substandard products and can contaminate products with harmful fragments. Proper maintenance ensures that machinery operates correctly and safely and prolongs its life, thus reducing capital and operating expenditure. A common reason for lost production is delays caused by equipment breakdowns and waiting for spare parts. This causes a processing unit to operate at below planned capacity and reduces its profitability.

Most small-scale producers do not keep a stock of spare parts because of the cost, but few producers have compared the cost of keeping a stock of spares with the cost of delayed production. This is especially important if delivery times for spare parts (e.g. for imported equipment) are several weeks. In most processes, a few items of equipment are likely to wear out more quickly than others (e.g. cutter blades, motors or bearings, heating elements, etc.). The processor should identify these priority spares for each process, and ensure that a spare component is always kept in stock. A spares record is useful to keep track of expenditure on spares in larger businesses.

Similarly, many small-scale processors do not have a programme of planned maintenance* to replace parts before they wear out. They believe that it is cheaper to continue using a machine until it breaks down and then repair it.

Case study: From Dairy Farming to Manufacturing: The Osia Ice Cream Company, Denmark

INTRODUCTION¹

The Osia ice cream company was formed by a private dairy farmer in 1994. As the amount of milk produced on the farm began to grow the farm had increasing difficulties in selling it in a fresh condition, particularly during the summer. The farmer looked at options for processing the milk in order to extend its life and visited a number of small cheese and ice cream producing companies for ideas on the markets and technologies required.

The farmer identified more than 40 companies producing such products in the Copenhagen area. However by talking to consumers and distributors of ice cream they found that only 3 were producing to high and consistent standards. Two of the distributors said they would consider selling products on behalf of the farm if they were able to produce reliable qualities with a good taste.

DISCUSSION

The farmer researched in detail how to make ice cream and identified Italian made machinery as being suitable for his requirements. The cost however was extremely high. In order to purchase the equipment he agreed a loan with a partner and the business was registered as a partnership. However soon after beginning production it became apparent that it would be impossible to repay the loan. The equipment was sold and the partnership stopped.

However the farmer persisted and purchased second hand equipment as a second attempt, producing two varieties of ice cream (coffee and vanilla) in traditional tubs. The farmer worked hard to keep good relations with his two distributors who ensured that it was stocked in local stores. Since his equipment was not new, he designed a programme of planned maintenance* for the equipment which included the replacement of parts before they wear out.

CONCLUSION

Sales have grown consistently and today the company produces three tonnes of ice cream per day and employs 10 persons. At present the company do not advertise

¹ Adapted from: FAO. Agribusiness management for small and medium sized businesses in Bulgaria. Part II Training approaches, case studies and exercises.

and depend largely on their agents and the quality of their products to increase their sales.

Even so the company has plans to expand, through up dating their technologies and by producing a wider variety of products. They are considering taking another loan and are preparing a business plan. The company would also like to carry out more detailed research as to why customers buy products. They anticipate increasing competition in the future particularly from imports and intend to be prepared.

Case study analysis

Based on your personal experience, consider the following questions on the proposed case:

1. Explain the reasons why the company failed in its first attempt of making ice cream.
2. Do you believe that the farmer made a depreciation calculus before he purchased the first equipment? Explain your answer using information from the case and including your opinion.
3. What are the advantages and disadvantages of buying second hand equipment? Mention at least three.
4. What do you think are the reasons why the farmer designed a programme of planned maintenance for the equipment he bought?

Bear in mind that at the end of the unit you will be asked to answer the same questions in the light of the new knowledge you will have acquired

Choosing equipment

The main decisions in relation to buying equipment are:

- which parts of a process require mechanization and which can be done manually;
- the correct size of the equipment (its capacity or throughput) for the intended scale of production to ensure that all equipment has a similar throughput;
- whether to buy equipment from a local engineering company or to import it.

MECHANIZED VERSUS MANUAL PROCESSING

Some processes, such as edible oil extraction from seeds and nuts, or milling cereal grains are difficult and time-consuming to perform manually and product yields* are low. They are usually mechanized and these processes therefore require greater start-up capital than most other types of agro-processing. The reliance on machinery also means that the management of maintenance and a spares inventory are important aspects of operating these types of business. Staff numbers are smaller than some types of agro-processing, but training is required to correctly operate and adjust machines to achieve maximum yields and productivity.

When planning production, a processor should therefore compare the costs of employing workers to do a particular job with the investment* of buying a machine.

Calculating the correct size of equipment

A common mistake is made when processors buy the only equipment that is locally available, without considering whether it is suitably sized for the likely sales volumes. The processor should plan the throughput that is required, research sources of equipment, and select a supplier that can provide a suitable machine.

SALES FORECAST

The first stage in deciding the size of equipment is to make an accurate assessment of likely sales. For a new business this is done as part of a feasibility study*. An existing business can collect these data by adding daily sales records to produce monthly totals. This information can be used to plan for additional equipment or

more staff where sales are increasing, or where sales are falling, the need for more product promotion or development of new products*.

PRODUCTION RATE

Sales information can be used to find the daily production rate employing the formula below. The production rate is then used to plan the amounts of raw materials, ingredients and packaging that have to be ordered.

$$\text{Production rate (kg/day)} = \frac{\text{Amount of product produced per month (kg)}}{\text{No of days of production per month}}$$

For example, if broiler feed sales are 24 tonnes per month and a feed mill works six days a week, then one tonne of feed has to be produced every day.

PRODUCT THROUGHPUT

The average amount of production per hour is known as the 'product throughput', and is calculated to help finding the required size of equipment.

$$\text{Throughput (units/hour)} = \frac{\text{Amount of product sold per month (units)}}{\text{No. of days of production per month} \times \text{No. hours worked per day}}$$

The calculation of throughput enables the processor to decide the size and number of pieces of equipment required. This type of calculation is shown in the following examples:

Example: Calculation of throughput

Using the production rate data above, and assuming that 2 hours per day are available for the staff to mix the feed, then the average throughput of the mixer is:

$$\begin{aligned} &= 1 \text{ tonne per day} / 2 \text{ hours per day} \\ &= 0.5 \text{ tonne/hour} \end{aligned}$$

If the feed mixer takes 30 min to mix a batch of feed, then two batches per hour are possible and a mixer with a capacity of $0.5/2 = 0.250$ tonne is suitable (i.e. a capacity of 300 kg to avoid over-filling).

Example: Calculation of throughput (continued)**Modified calculation of throughput**

Because of load shedding, the feed mill cannot operate electric mixers on Mondays and Thursdays each week. To achieve the production levels needed to meet planned sales targets, the production rate must therefore be increased on the four days that mixing can take place: i.e. = 24 tonnes/month /16 days/month = 1.5 tonnes/day.

Then the average throughput of the mixer needs to be: = 1.5 tonnes/day/ 2h/day = 0.750 tonnes/hour.

A mixer with a capacity of 0.750 tonnes/hour/2 = 0.475 tonnes is required (a bowl capacity of 500 kg).

Example: Choosing the size of equipment

If 3 hours are available to boil 36 kg of jam per day, the throughput for the boiling stage is:

$$36/3 = 12 \text{ kg per hour.}$$

A batch of jam should be boiled within approximately 15 minutes to maintain the quality of the product, and a maximum of three batches per hour are possible. The processor therefore has a number of choices: 1.) To buy a single, large (e.g. 15-20 litre) stainless steel pan and a large burner to heat one 12 kg batch of product within 15 minutes. This is the most expensive option, but production is straightforward and requires the least organization. 2.) Process two batches of 6 kg using a smaller (e.g. 10 litre capacity) boiling pan and a smaller burner. 3.) Process three batches of 4 kg each using a smaller (e.g. 6 litre capacity) boiling pan and a smaller burner. This is the cheapest level of investment but requires more complex work organization, staff skills and production planning*.

MATCHING EQUIPMENT THROUGHPUTS

In agro-processing there is usually a short delay between the different stages in a process, and to avoid bottlenecks* it is important that all equipment has a similar throughput. To calculate the requirements for all equipment in a process, the

TABLE 1
Use of a process chart to calculate the equipment needed to produce 52 kg of biscuits per day

Process stage	Equipment required	Calculation/assumptions
Ingredient weighing	By hand	-
Dough mixing	Mixer bowl with 15 Kg capacity	Mixer needs 20 minutes to mix each batch –i.e. 2 batches per hour. 2 hours mixing requires capacity of $26/2 = 13$ Kg (capacity of 15 kg to avoid overfilling).
Biscuit forming	Forming machine capacity 1500 pieces per hour	52 Kg dough formed into 10 g pieces (5 200 pieces). 3 ½ hours for forming.
Baking	Oven with 8 trays each capable of holding 50 biscuits	Baking time = 15 minutes –i.e. 3 batches per hour (1 200 biscuits per hour). Total 4.3 hours baking.
Cooling	Rack having 24 shelves	8 trays per hour with one tray per shelf. Temporary storage of biscuits for 3 hours before packing.
Packing in film	Manual filling. Heat sealer capable of 100 packs per hour.	20 biscuits per pack = 260 per day. Packing for 2.6 hours.
Packing in cartons	By hand	20 packs per carton = 13 cartons per day.

process should be written down as a chart, showing the weights of food at each stage that are needed to achieve the planned production rate (Table 1).

It is preferable to buy equipment from local suppliers or engineering companies because they are close by to service or repair the equipment. The purchasing price is often lower than imported equipment and spare parts can be obtained faster and more easily. However, the quality of workmanship and the willingness or capacity of engineering companies to provide a repair service needs to be taken into consideration before choosing a particular type of equipment.

Sources of equipment

When importing equipment the main difficulties are finding information on the available types of equipment, the willingness of overseas suppliers to meet small orders for equipment, and the higher costs (freight and clearing charges, import duties and the capital cost). Information on types of equipment, specifications and costs is increasingly available on the Internet (see further readings), and processors may be able to gain access to the Internet, or seek advice and assistance from offices of development agencies, Chambers of Commerce, university food science and technology departments, manufacturers' associations, or at embassies of exporting countries. When ordering equipment, it is necessary to:

- specify exactly what is required (many manufacturers have a range of similar products);

- describe the throughput required in kg or litres per hour and the type of food to be processed;
- give other information such as model number of machine, single or three-phase power, number and types of spares required.

Equipment maintenance

Decisions regarding the costs and benefits of planned maintenance* depend on the speed at which repairs can be done, the value of the spares that have to be held in stock and the value of lost production caused by stoppages. Processors should monitor the equipment, and as their experience of the rate of failure accumulates, they should service the machine before a replacement part is needed. Arrangements can be made with a local mechanic to repair equipment as a priority, if the processor pays an annual service fee or guarantees that they will handle all such work.

A maintenance schedule shows how often a machine should be serviced, gives details of what should be done during the service, and how the machine should be dismantled and re-assembled. Management of maintenance therefore involves identifying the priority equipment and preparing a maintenance budget in order to implement the maintenance schedule.

Staff should be trained to routinely check machinery during operation, and to undertake the maintenance schedule. The results should be written down so that the cost can be evaluated and to check whether the schedule prevents breakdowns.

Example of planned maintenance* in a flourmill	
W E E K L Y	Mechanical
	✓ check and grease bearings, replace if faulty;
	✓ check pulley wheels for cracks or chips and replace if necessary to avoid damaging belts;
	✓ check bolts and nuts for tightness;
	✓ check the oil level in diesel engines and top up with the correct oil if required;
	✓ remove flour dust from equipment each day. A build-up of dust causes rust to develop and on electrical equipment it causes moving parts to jam.
	Electrical
	✓ clean flour dust off motors and other electrical equipment;
	✓ for machines not in use, switch off mains power. This is very important when power cuts occur, because when power returns a machine that has been left on can injure an operator or cause a fire.

Example of planned maintenance* in a flourmill (Continued)	
Housekeeping	
M O N I T I N G	✓ store tools and equipment in pre-determined places so they are easy to find and it will be noticed if they go missing;
	✓ always keep walkways clear of tools and equipment;
	✓ clean diesel engine cooling fins every day to prevent dust settling and causing the engine to overheat and eventually seize;
	✓ store tools and equipment in pre-determined places so they are easy to find and it will be noticed if they go missing;
	✓ always keep walkways clear of tools and equipment;
	✓ clean diesel engine cooling fins every day to prevent dust settling and causing the engine to overheat and eventually seize;
	✓ when re-fuelling diesel engines, pour the fuel through a filter to prevent rust deposits in the fuel drum getting mixed with the fuel and damaging the engine;
	✓ clean the machinery and floor;
	✓ check hammers for wear and replace if necessary;
	✓ check the shaft (especially if locally manufactured machines are not tested for strength or alignment);
	✓ check that locking nuts on the shaft are tight;
	✓ check that fan bolts and nuts are tight. If they work loose, the fan becomes very dangerous;
	✓ check the bearing mountings as this area is prone to cracking;
	✓ check the engine oil and oil filter on diesel engines and change them every 160 working hours; change the fuel filter every 320 working hours.
	✓ check the body casting and welds for cracks;
	✓ tighten floor nuts and look for any cracks in the mill foundation;
	✓ check the fan key and make sure that the fan is a slide fit on the shaft for easy removal. If the blades are worn always replace with the correct thickness of steel, and then check for balance;
✓ check that cables are secured and there is no obvious sign of insulation breakdown;	
✓ check the acid level in batteries that are used to start diesel engines. Keep the terminals clean.	

MAINTENANCE RECORDS

Maintenance and repair records provide information on the performance of equipment, and maintenance costs that are included in calculations of operating costs (Table 2).

TABLE 2
Maintenance and repair records

Date	Work carried out	Time spent	Cost of labour	Parts used	Cost of parts

Depreciation for equipment

Equipment gradually wears out when it is used, and depreciation is a method to accumulate sufficient funds to buy a replacement at the end of its working life. When a machine, a vehicle or office equipment is purchased, the processor should estimate the number of years that it is expected to last before it requires replacement (or its expected working life). The value of the equipment is then divided by this time, and the depreciation figure is included in the annual company accounts.

LINEAR OR STRAIGHT LINE METHOD OF DEPRECIATION

Linear or straight line method of depreciation are shown in Table 3.

TABLE 3
Linear or straight line method of depreciation

Equipment	Value (US\$)	Expected working life (years)	Depreciation per year (US\$)
Delivery vehicle	15 000	10	1 500
Bowl chopper	8 000	15	533
Refrigerator	2 500	15	167
Stainless steel tables	500	25	20
Hand tools (knives, sharpeners, etc.)	120	5	24
Sausage stuffer	1 500	15	100
Mixer	1 200	15	80
Office furniture and equipment	400	25	16
Total	29 220		2 440

A new delivery van is bought for US\$21 000. It is estimated to have a life of 5 years with a residual value of US\$2 000. Using the straight-line method, the annual depreciation is:

$US\$21\,000 - US\$2\,000 = US\$19\,000/5 = US\$3\,800$ per annum. The balance sheet value of the vehicle would be reduced by the same amount each year.

REDUCING BALANCE METHOD

In this method, the depreciation in the early years of an asset's life is higher than in later years and the asset is written off using the same percentage each year. It can be expressed as a formula:

$$\text{Depreciation (percent)} = (1 - n R/C) \times 100$$

where:

n = life of the asset in years;
 R = residual value of the asset;
 C = cost of the asset

Example: Reducing balance depreciation

A machine is bought for US\$8 000 and has a life of 4 years. A 40 percent charge is made each year, so in the first year the depreciation is 40 percent of US\$8 000 (US\$3 200), which reduces its book value to US\$4 800 (8 000–3 200). In the second year the depreciation is 40 percent of the book value (US\$4 800 x 40 percent) - i.e. US\$1 920 – and so on over 4 years.

SUM OF DIGITS METHOD

This is a variation of the reducing balance method and also charges higher depreciation in the first years of the asset's life.

Example: Sum of digits method

If a machine is bought for US\$12 000 and has a US\$1 000 residual value after 4 years.

Sum of digits: 4 years + 3 years + 2 years + 1 year = 10

Year 1: $4/10 \times (12\,000 - 1\,000) =$	US\$ 4 400	Cumulative charge =	US\$ 4 400
Year 2: $3/10 \times (12\,000 - 1\,000) =$	US\$ 3 300		= US\$ 7 700
Year 3: $2/10 \times (12\,000 - 1\,000) =$	US\$ 2 200		= US\$ 9 900
Year 4: $1/10 \times (12\,000 - 1\,000) =$	US\$ 1 100		= US\$11 000

Conclusions on the case study

Having compared your prior knowledge with the subject content of the unit, answer the following questions making optimum use of the new knowledge you have acquired.

1. Explain the reasons why the company failed in its first attempt of making ice cream.

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2. Do you believe that the farmer made a depreciation calculus before he purchased the first equipment? Explain your answer using information from the case and including your opinion.

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3. What are the advantages and disadvantages of buying second hand equipment? Mention at least three.

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4. What do you think are the reasons why the farmer designed a programme of planned maintenance for the equipment he bought?

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Group exercise

We return to the example of the Chiang Mai Agribusiness in Module No 3. The enterprise need to purchase new computerised equipment for the chilling process of broccoli. The equipment is bought for US\$1 000 000.00. It is estimated to have a life of 10 years with a residual value of US\$50 000.00. Calculate the annual depreciation using the straight-line method.

Investigate the process stage and equipment required to produce chilled broccoli. Use a process chart to calculate the size of the equipment needed to produce 1 tonne of chilled broccoli per day.

Summary

- Proper maintenance ensures that machinery operates correctly and safely and prolongs its life, thus reducing capital and operating expenditure.
- The reliance on machinery also means that the management of maintenance and a spares inventory are important aspects of operating these types of business.
- The processor should plan the throughput that is required, research sources of equipment, and select a supplier that can provide a suitable machine.
- The first stage in deciding the size of equipment is to make an accurate assessment of likely sales. For a new business this is done as part of a feasibility study. An existing business can collect these data by adding daily sales records to produce monthly totals.
- The average amount of production per hour is known as the 'product throughput', and is calculated to help finding the required size of equipment.
- To calculate the requirements for all equipment in a process, the process should be written down as a chart, showing the weights of food at each stage that are needed to achieve the planned production rate.

- It is preferable to buy equipment from local suppliers or engineering companies because they are close by to service or repair the equipment. The purchasing price is often lower than imported equipment and spare parts can be obtained faster and more easily.
- Decisions regarding the costs and benefits of planned maintenance depend on the speed at which repairs can be done, the value of the spares that have to be held in stock and the value of lost production caused by stoppages.
- Management of maintenance therefore involves identifying the priority equipment and preparing a maintenance budget in order to implement the maintenance schedule.
- Equipment gradually wears out when it is used, and depreciation is a method to accumulate sufficient funds to buy a replacement at the end of its working life.
- When a machine, a vehicle or office equipment is purchased, the processor should estimate its expected working life. The value of the equipment is then divided by this time in years, and the depreciation figure is included in the annual company accounts.
- There are three methods to calculate depreciation: linear or straight line method, reducing balance method, and sum of digits method.

Unit assessment

Answer the following questions on additional sheets of paper:

- 1. Mention some decisions that have to be taken in relation to choosing equipment.

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- 2. Explain the importance of calculating the correct size of equipment, and mention the stages in deciding it.

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- 3. What are some benefits of planned maintenance?

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- 4. What is the use of calculating depreciation of equipments? Mention 3 methods.

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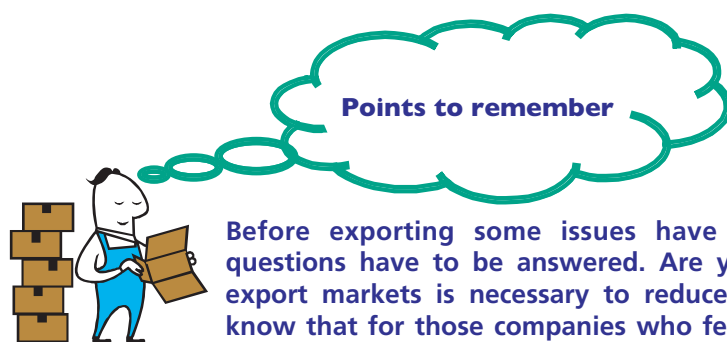
If when attempting to answer these questions you have any doubts or feel that you do not have sufficient information for the analysis, take another look at the manual, consult the student’s handbook or contact the facilitator.

Managing exports in small-scale agro-industries

UNIT FOUR

LIST OF TOPICS

1. Setting the context
2. Case study: The Haarlem Honeybush Producer Group, South Africa
3. Case study analysis
4. Researching export markets
5. Export options
6. Finding partners and making legal agreements
7. Pricing, delivery terms, and documentation
8. Getting paid
9. Export insurance
10. Conclusions on the case study
11. Group exercise
12. Summary
13. Unit assessment



Before exporting some issues have to be analysed and some questions have to be answered. Are you aware that research into export markets is necessary to reduce the risk of failure? Do you know that for those companies who feel that dealing with overseas markets is well beyond their capability there are other export options? If your enterprise planning to export to the EU, do you know which regulations to follow? Do you know that in international trade there are a number of defined and codified terms and several necessary trade documents?

Exporting needs to be taken seriously and is not a means to ship out surplus production. Top management commitment to export is essential for success.

**By the time you complete this unit
you will be able to:**

- 🔗 Identify new opportunities to export your products by yourself or with the help of others.
- 🔗 Gauge the economic implications of not getting paid on time.
- 🔗 Learn terms and documentation required in international trade.
- 🔗 Recognize other export options.
- 🔗 Appreciate the importance of export insurance.



Setting the context

Globalization offers businesses many opportunities. New opportunities arise as trade barriers are reduced. This allows countries and companies to increasingly specialize in areas of best opportunity and more efficiently allocate resources. However there are numerous additional challenges and opportunities in exporting. There are differences between countries with regard to currency, language and culture, technologies, business practices, legislation, buyer needs and politics. No business can afford to embark on a new venture unless it is reasonably assured that adequate financial returns will result. Before contemplating to export the following questions need to be answered:

- What is the reason for entering export markets?
- What products can be exported?
- Who would be the overseas buyer?
- How can the goods be best exported?
- Is exporting profitable?
- How can possible failure be avoided?

Whilst there are many good reasons for exporting, there are also perfectly valid arguments against, such as fluctuations in the exchange rates, the costs of modifications to the product for export; the need to assign financial, management and other resources, or additional complexities that arise from entering into export contracts. Any decision to export must be based on opportunities available.

Case study: The Haarlem Honeybush Producer Group, South Africa

INTRODUCTION¹

Honeybush (*Cyclopia* spp) is a perennial woody fynbos shrub, unique to South Africa, whose leaves and stems are used to make an herbal, caffeine-free tea with acclaimed medicinal properties which are gaining credibility from emerging scientific research. Historically honeybush has been harvested in the wild. However, as the honeybush market grows and formalizes, wild harvesting becomes increasingly inefficient from an economical point of view and unsustainable from an environmental point of view. A shift from wild harvesting to cultivated production was the logical next step, especially if new international markets are being opened. In 2001, amongst the first to engage in such honeybush cultivation was the Haarlem farming communities.

Haarlem is a community of subsistence farmers located in the midst of large-scale commercial fruit (apple) growers in the Langkloof valley near the Western Cape –Eastern Cape border. The community consists of approximately 3 500 mostly colored people in 900 households with great diversity in social status. Wild harvesting of honeybush has traditionally been another important source of income for Haarlem's households. In order to address the growing economical and ecological concerns, the Haarlem community started to shift away from wild harvest to cultivation, establishing the first honeybush plantation in 2001. One of the reasons of taking this decision had to do with Haarlem's interest to export the product.

DISCUSSION

Although consumed by households in South Africa since at least the 1700s, honeybush tea has been marketed and supply chains have emerged only since the 1960s for the local market and since the 1990s for the export market. As a consequence, the honeybush consumer market is growing fast. Demand for honeybush is growing at more than 30 percent per year on average (from 30MT in 1997 to 220MT in 2004). Most of the plantation production is organic. Producers opted for this kind of production mainly because it supports the healthy image of Honeybush tea, especially in exports markets where the tea is marketed to health conscious consumers.

¹ Adapted from: Neven, Goliath, Reardon, Hopkins. 2005. Case studies of organizations linking to dynamic markets in South Africa: The Haarlem and Erikaville honeybush producers in South Africa. <http://www.pfid.msu.edu/SACaseHaarlemandEricaville.pdf>. Some facts have been modified for training purposes.

Honeybush processing consists of six steps: cutting, oxidation, drying, sieving, sterilization and packaging. There are eight honeybush processors in South Africa. The largest processors are Honeybush Natural Products (HNP), and Cape Honeybush Teas (CHT). Together these two companies present roughly 66 percent of the processed honeybush market. The two companies use similar processing technologies and have implemented HACCP systems; both are organic certified. Whereas HNP is partially integrated backward into production only, CHT is fully integrated along the supply chain from nursery to finished, shelf-ready product.

While most of the tea produced is conventional fully fermented (“black”) tea, HNP also produces organic honeybush (15 percent of output) as well as small batches of green honeybush (<5 percent of output). In compliance with the requirements of Ecocert, HNP processes organic tea separately from conventional tea. Although bulk organic honeybush tea receives a R2/kg (10 percent) premium at the processor and packaging level, demand is still low at this point.

Green tea processing (i.e. the natural fermentation process is halted) is still experimental and more costly than regular processing. The green and organic teas are mainly produced to address demand in export markets, most notably Germany which is establishing itself as the tea and coffee wholesaler for the European market.

CONCLUSION

About 25 percent of production is marketed in the domestic market where honeybush is widely available in the supermarkets under a range of consumer brands. These include packaging firm brands (Freshpack, Vital, 5 Roses) as well as private label brands (e.g. SPAR, Woolworths). With regard to the export market, 90 percent of honeybush is exported bulk and then packaged for retail in export markets. A notable retail-shelf ready product for the export market is CNTP’s Intaba brand which is doing well in the Canadian market. The main export markets for bulk honeybush are Germany, the UK and Poland. Markets which are buying small volumes at the moment but with great export potential include the United States and Japan.

Haarlem farmer groups realize that exportation was a difficult duty especially if it was done directly. However other options came into their mind such as becoming suppliers of a large processor who is exporting the product. Nowadays the Haarlem farmer groups supply all of their honeybush to HNP, and are working to accomplish the processor’s standards such as producing organic honeybush.

Case study analysis

Based on your personal experience, consider the following questions on the proposed case:

1. Describe the export option that Haarlem farmer groups adopted. Do you think this was the best exporting option? Explain your answer.

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2. What regulations are the processors following in order to export to the international markets (especially European markets)?

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3. Explain the reason why green and organic teas are mainly sold in export markets.

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4. Why do you think that honeybush is exported bulk and then packaged for retail in export markets?

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Bear in mind that at the end of the unit you will be asked to answer the same questions in the light of the new knowledge you will have acquired.

Researching export markets

Research into export markets is necessary not guarantee success but to reduce the risk of failure. Basic information about the target area includes information on climatic conditions, ports and distances, the political environment, tariff barriers, customs duties or quotas, non tariff barriers (i.e. phyto-sanitary regulations, labelling requirements), currency restrictions and convertibility, the level of economic development and social conditions, language, demographic structures, and socio-economic data such as religion and cultural differences, habits, fashions, trends, styles and tastes. Other essential export information includes:

- the potential market size*;
- storage and distribution facilities;
- availability of import agents;
- local competition ;
- legal requirements or special produce standards;
- tariffs;
- technical specifications such as measurements and calibrations;
- quality specifications;
- taxation – related to size, types of packaging etc.

Most countries have import requirements that apply at all stages of distribution and the produce must comply with the standards if it is to be imported into the country. Produce may be monitored at border points or in many cases to authorized quality inspection bodies at the place of production and the country of origin. Requirements are often very specifically defined and exporters need to be clearly aware of the regulation on individual products before sending them for export and incurring unnecessary cost. Exporters have also to be aware of packaging and labelling requirements.

Export options

Many companies feel that it is well beyond their capability to deal direct in overseas markets. It may be decided to leave exporting in the hands of others as far as possible. There are several opportunities which can be exploited.

MANUFACTURERS

This simply means selling the product to a manufacturer who is already in the export business. This is a popular option for numerous businesses in the export trade. Risks and costs are low.

IN-COUNTRY BUYING OFFICES

Represent the buyer abroad. They act as a principal who can deal directly with a producer or trader. They finance the transaction, accept the short-term risk and are paid a commission by the buyer for this service. Many larger overseas buyers maintain own buying offices in high turnover countries.

AGENTS

An agent may be defined as the legal relationship which exists, when, a person or company is paid by another person or company (the “principal”) to bring a contractual or sales relationship with a third party. Normally the legal title of the goods does not pass from the principal to the agent. The agent is simply paid a commission on sales and an annual retainer for services. Agents vary considerably in terms of services offered and commissions charged. Agents may be individuals, partnerships, small companies or large-scale traders, trading houses or manufacturers. There are four main types of agent and it is important to know what each one does and what they are responsible for.

Commission agent

The commission agent sells with the aid of samples and/or catalogues. The agent does not hold any stock but only passes orders to the principal who in turn effects delivery and collects the money or payment.

Stocking agent

This agent stocks products and may provide storage and handling facilities. A stocking agent expects not only commission but also a fixed sum to cover storage and handling.

Agency with specialist support facilities

This agent may provide additional services, such as fruit de-greening or packing and used in agreement with the company.

Del credere agent

A del credere agent takes on a credit risk and agrees to pay the company if the customer defaults. Such an agent is likely to ask for a higher rate of commission to compensate for the risk. In some countries a del credere agent can be less expensive than taking out credit risk insurance.

Generally agents can be more closely controlled than merchants/distributors. They must market the products on the terms stipulated by the exporter who has the right to accept or reject any order generated.

DISTRIBUTORS

They act as a principal for buying and selling on their own account. Agents are often confused with distributors. A distributor is classified as a customer who has been granted exclusive or rights to *purchase and resell* a range of products or services in specified areas or markets. Distributors are effectively wholesalers operating overseas and have their own sales people, stockists and offices. They are normally remunerated by the difference between the buying and selling price. They tend to specialize in certain territories and with a particular range of goods.

There are 4 main types of distributor:

Sole merchant/distributor

Where a sole merchant/distributor is appointed no other can be appointed in that territory.

Exclusive merchant/distributor

Even the exporter is not allowed to sell within the territory. The contract refers specifically to a product or product range.

Non-exclusive merchant/distributor

In this case the exporter can also sell directly and appoint other merchants/distributors in the territory.

Selective merchant/distributor. Approved dealers are used with particular support services, equipment and facilities in line with exporter policy, standards and procedures.

JOINT VENTURES

Joint ventures can be established either by means of licensing or franchising. The term licensing covers a wide range of agreements relating to the sale or leasing of industrial or commercial expertise by one party or another. Items covered by a license include:

- a patent covering a process;
- manufacturing know how;
- technical advice and assistance;
- the use of trade mark or name.

FRANCHISING

It is a form of licensing whereby the franchiser provides a standard package of components plus management and marketing service and advice. The franchisee in return provides the capital, market knowledge, personal involvement, premises, etc. The advantages of licensing and franchising are: market access, particularly where markets are closed or difficult to access due to high duties, import quotas or prohibitions, freight charges or entrenched competition; little capital investment* and the use of existing distribution and sales networks. However franchises bear certain risks.¹

Finding partners and making legal agreements

Finding and working with a good partner takes time to produce results, but the arrangement may be a long lasting. There are a number of options for identifying potential partners:

- personal contacts;
- chambers of commerce;
- banks;
- trade associations;
- agents associations;
- directories;
- advertising in appropriate journals;
- export trade representative services;
- Internet.

¹ For more information: <http://www.mac.doc.gov/ceebic/thebasics/classexporters.htm>.

Any competent potential partner wants to have the full information about the exporter who will need to draw up a profile. When a suitable agent/merchant/distributor is found, the exporter needs to conclude a formal legal agreement. This should be as short and simple as possible and should contain certain essential points:

- Parties to the contract – who are they, where are they located and in which capacity do they contract.
- Products – definitions of the products subject to the agreement.
- Territory – a proper definition of the territory in which the agent is entitled to act.
- Exclusivity – will the agent have sole and exclusive rights to trade the products? will the exporter have any rights to operate directly in their region? will the agent have any rights to receiving commission on orders placed directly with the exporter?
- Rights and duties – what level of sales and marketing assistance is to be provided and what information should be given to the exporter? to what extent must the agent comply with the exporter instructions on prices and conditions of sale? is any minimum turnover to be stipulated?
- Commission - there is the need to agree on the percentage rate of commission, the variations for different origins of orders and the basis of calculations for commission (CIF, FOB, etc.) and the time of payment, e.g. following receipt of goods, delivery of an order or payment by the customer.
- Duration of the contract – the starting date and the expiry date.
- Termination – provisions whereby the contract can be terminated before the natural expiry date, e.g. breach of contract or bankruptcy.
- Language – as the contract may be translated it is important to state which is the authentic text.
- Law – the agreement should state which national laws govern the interpretation of the contract. In some cases regardless of what is agreed by the two parties, the law of the agents country may still apply.

Pricing, delivery terms, and documentation

In international trade there are a number of defined and codified terms. The International Chamber of Commerce¹ under the heading INCOTERMS² and these are updated and revised every 10 years. The most common terms are:

Ex works price (EXW)

This is the most basic quotation. The buyer agrees to buy the goods from a warehouse and cover all transport, insurance and duty costs themselves. Any costs of product modifications and other company overheads relating to the export order, including agents' costs, export department and packing costs need to be included in the quote.

Free alongside ship (FAS) or free carrier (FCA)

Goods are delivered to a named port or place. The exporter deals with export formalities but the buyer is responsible for loading on to the agreed method of transport.

Free on board (FOB)

The most common form of delivery with a named port added. The buyer has the option of organizing the handling, insurance and transport. Documents have to be paid for which get the goods loaded on to the selected method of transport and at the named port. Responsibility for the shipment passes to the buyer as soon as they cross the ship's rail or enter the agreed form of transport. Similar terms apply for aircraft (FOA) or if to an inland clearance depot (ICD) the term is free carrier named port (FRC).

Cost and freight (C&F or CFR), for container shipments delivery carriage paid (DCP)

This means that the seller pays all freight charges but not the insurance. The buyer takes risk when the goods are on board ship.

¹ <http://www.iccwbo.org/>

² <http://www.iccwbo.org/incoterms/understanding.asp>

Carriage paid to (CPT)

The exporter is responsible for delivering to an agreed place to be handed over to another agreed carrier or freight forwarder. The exporter pays for all costs and freight charges to the named place.

Cost, insurance and freight (CIF) for container shipments (CIP) and CPT

This is the same as CFR except insurance is also paid by the exporter. A destination port is normally added in the quotation.

Delivered at frontier (DAF)

Delivered at frontier and cleared for export but not import. The seller pays all freight costs to the named place.

Delivered ex ship (DES)

The goods are delivered on board of a ship at the named destination port. The seller pays all export costs but not unloading charges.

Delivered ex quay (DEQ)

The goods are delivered on to the delivery quay. The seller pays all costs and freight, unloading and import clearance and states whether duty will be paid or unpaid.

Delivered duty unpaid (DDU)

At the named destination place in the country of import. The seller pays all the costs to the named destination place but not duties, taxes or import charges.

Delivery duty paid (DDP)

The exporter pays all the charges and carries the risks until the goods reach the buyers warehouse. This includes payments of all duties.

The best approach is to quote as the customer requests and to add on the extra costs as required under the terms of the delivery. Careful examination of the terms of delivery is very important to include all incurred costs in a quoted price.

The first instinct of a new exporter is to quote in the currency of the exporter. This provides two major advantages: it is simpler from an administrative point of view and the risk of any exchange variations is borne by the customer. However

the customer may not be prepared to take such a risk and may ask for a quotation in his//her national currency to know exactly how much is paid. Currency fluctuations have to be considered carefully and quotations can be made using spot or forward rates. *Spot rates* are current rates of exchange. *Forward rates* are deals to be completed some time in the future. In order to avoid receiving less than is anticipated due to currency fluctuation, a company can make a contract with their bank to sell the currency forward and it is this rate that is used in the quotation. Most major international currencies can be bought and sold for several years ahead. For most trading companies the main aim is not to profit on exchange movements but to trade profitably and securely. A forward exchange contract still does not offer complete protection against exchange risks. The contract matures on a fixed date, normally the date on which payment is due to be received by the buyer. If there is a delay in payment (or worse non payment) the exchange risk is borne by the exporter. If the credit risk is insured there will be no problem.

Having decided which currency to quote in, the company needs to decide the validity date of the offer. Quotations are made either by having a price list or by stating the details on a proforma invoice*. The following details need to be included in a quote: the normal method of payment; any clauses which retain use of a trademark (or patent of any), that damaged goods will be replaced free of charge, and/or that the exporter will hold the customer responsible for obtaining an import licences.

Standard export documents are the following:

- Bill of lading*
- Airway bill*
- Proforma invoice
- Commercial invoice*
- Certificate of origin*
- Phytosanitary certificates*
- Packing list*
- Export permits*
- Fumigation certificate*

Getting paid

There are a number of ways of improving the flow of cash, but getting paid on time is particularly crucial. Delays in payments require higher levels of working capital and reduce overall profitability. It is important to keep a check on outstanding

payments and to make efforts to ensure they are paid. For most importers pre-payment will not be acceptable, as they have little guarantee they will receive the goods according to the contract. An acceptable method of minimizing risks for both parties is therefore required.

Sensible precautions from the beginning of any transaction need to be taken. The buyer's ability to pay needs to be assessed. For major transactions or for first time deals the name and address of the customer's banker need to be sought. The bank should give a reference before any legal contract is signed. Specialist agents are able to provide more detailed reports on potential buyer.

NECESSARY TRADE DOCUMENT

Invoices. The basic document used for trade is an invoice. A pro-forma invoice is used as the basis for preparing a quotation for a customer. After despatch, commercial invoices are used mainly as record of goods shipped and as a statement of the terms on which they are shipped. The invoice contains details of weights, marks and measurements, plus details of freight and insurance costs and the method of despatch. For exports, the commercial invoice need only be signed by the exporter to be accepted by the customs office of the import country as a true record of value and origin on which duty will be paid. In some countries a certified invoice is required which can be obtained through the local chamber of commerce.

Invoices should only be used for payment if the customer has open account terms. That is that the exporter trusts the customer to pay at a later date without any further documentation. Over 80 percent of the world's trade is handled on this basis.

DOCUMENTARY LETTERS OF CREDIT

An export letter of credit is available from a bank as a form of trade guarantee. The principle is quite simple. The buyer asks his/her bank to open a credit in favour of the seller and lays down certain conditions on which payment is made. The buyer's bank then informs the seller's bank of the credit availability and provides a payment guarantee. The letter of credit has to be *irrevocable* i.e. that it cannot be altered without the consent of both banks, the credit has to be *confirmed* which means that the money has been credited to the bank in seller's country. Revocable or unconfirmed credit can create circumstances whereby the terms of the agreement may be changed without your agreement or money not be transferred. Other options are: a *transferable letter of credit* which enables all or part of the credit to be transferred to a third party and a *revolving letter of credit*. This may be used for regular shipments to the same buyer and reduces documentation.

A BILL OF EXCHANGE

In some countries (such as France) it is not legally possible to use an invoice for exports and a bill of exchange has to be prepared. This is a demand for payment to be settled on demand or at a fixed or determined time in the future. A bill of exchange allows the buyer to pay after delivery. It also can be used to withhold delivery in the event of non-payment. It is the exact opposite of a letter of credit because a banker's draft is forwarded to the buyer's bank. The bank then presents the draft to the buyer. There are two types of draft. A *sight draft* is payable as soon as the buyer receives the delivery documents. A *term draft* is payable in multiples of 30 days after the sight of the documents. The buyer agrees the due date and writes accepted on the documents to enable delivery.

CHEQUES

Cheques need to be cleared by the issuing bank before the despatch of goods. A *bankers draft* is more satisfactory because this is a guaranteed payment by a bank.

Export insurance

Any business involves some risk. Exporting, however, exposes a business to higher risks than dealing with the domestic market. There is no law that says that export goods have to be insured, but it is prudent to do so. The subject of insurance requires specialist advice from an insurance broker. It is up to the owner of the goods against which risks to insure. Virtually any risk can be covered except inherent vice (i.e. the damage cannot be avoided such as salt or sugar attracting damp) and illegal cargoes. It is important to check whether there are provisions for:

- poor packaging;
- seaworthiness;
- delays by strikes;
- war, riots and civil unrest.

The following risks are common to be insured.

RISK DURING TRANSIT

Goods are normally insured on a *through basis* that is from the time they leave the seller until they reach the buyer. A letter of credit needs to specify the conditions

of insurance such as the insurable value of the goods. This value is calculated as the CIF value of the goods plus 10 percent.

RISK OF NON-PAYMENT

A non-paying overseas customer causes serious problems. To have cover against this common risk, there are a number of companies that specialize in covering credit risk.

COUNTRY RISKS

There are also country risks that can be insured against and which may include difficulties or delays in getting funds out of the buyer's country, intervention by a Government that prevents the contract being completed in part or full, civil war or cancellation or non renewal of an export licence or new restrictions imposed by the importer country.

Insurance premium costs need to be included in the agreed selling price. As a guide companies are likely to pay around 1 percent of the total value to insure the product.

Conclusions on the case study

Having compared your prior knowledge with the subject content of the unit, answer the following questions making optimum use of the new knowledge you have acquired.

1. Describe the export option that Haarlem farmer groups adopted. Do you think this was the best exporting option? Explain your answer.

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2. What regulations are the processors following in order to export to the international markets (especially European markets)?

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3. Explain the reason why green and organic teas are mainly sold in export markets.

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4. Why do you think that honeybush is exported bulk and then packaged for retail in export markets?

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Group exercise

- Select a country you do not know well. Using an Internet search engine find out as much information as you can regarding, climates, ports and distances, politics, tariff barriers, customs duties or quotas, currency restrictions and convertibility, the level of economic development and social conditions, language, literacy, religious differences, habits and styles.
- Get as much information as possible on specific EU regulations for the products you trade.
- Identify 3 agents from an EU country. Find out as much as you can about their services and operations.
- Get a full list of documents needed for export of your product from your country. Also identify freight forwarders able to carry out this work.

Summary

- Any decision to export must be based on opportunities available. Exporting needs to be taken seriously and is not a means to ship out surplus production.
- Research into export markets is necessary not to guarantee success but to reduce the risk of failure.
- Basic information about the target area includes information on climatic conditions, ports and distances, the political environment, tariff barriers, customs duties or quotas, non tariff barriers, currency restrictions and convertibility, the level of economic development and social conditions, language, demographic structures, and socio-economic data.
- Export options include working in the hands of others: manufacturers, in-country buying offices, agents, or distributors. It may also be working by establishing joint ventures or franchising.

- In the European Union the Common Agricultural Policy (CAP) provides for a system of common prices within the EU trade area. The CAP primarily covers a wide range of basic products and intends to secure food supplies and to protect domestic producers from world market price fluctuations.
- Laws governing entry of food into all countries of the European Union are stringently applied. Food laws allow enforcement officers to inspect and seize, at any time, food intended for human consumption and if suspected of not complying with food safety requirements.
- It is the legal responsibility of the importer to ensure that products conform to local market food safety requirements.
- Finding and working with a good partner takes time to produce results, but the arrangement may be a long lasting.
- In international trade there are a number of defined and codified terms. The most common ones are: EXW, FS, FCA, FOB, CFR, CPT, CIF, CIP, DAF, DES, DEQ, DDU, and DDP.
- The first instinct of a new exporter is to quote in the currency of the exporter. This provides two major advantages: it is simpler from an administrative point of view and the risk of any exchange variations is borne by the customer.
- Standard export documents are the following: Bill of lading, airway bill, proforma invoice, commercial invoice, certificate of origin, phyto-sanitary certificates, packing list, export permits, and fumigation certificate.
- Delays in payments require higher levels of working capital and reduce overall profitability. Therefore the buyer's ability to pay needs to be assessed. For major transactions or for first time deals the name and address of the customer's banker need to be sought. The bank should give a reference before any legal contract is signed.
- Necessary trade documents are invoices, documentary letters of credit, bill of exchange and cheques.
- Exporting, exposes a business to higher risks than dealing with the domestic market. There is no law that says that export goods have to be insured, but it is prudent to do so.
- The following risks are common to be insured: risk during transit, risk of non-payment, and country risks.
- Insurance premium costs need to be included in the agreed selling price. As a guide companies are likely to pay around 1 percent of the total value to insure the product.

Unit assessment

Answer the following questions on additional sheets of paper:

- 1. Why research into export markets is important? Mention some basic information needed from the target area.

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- 2. Explain at least three export options.

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- 3. Define the following terms: FOB, CIF, DEQ, and DDP.

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- 4. Mention and describe at least 5 standard export documents.

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- 5. Explain the reasons why it is important to insure goods that are going to be exported.

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If when attempting to answer these questions you have any doubts or feel that you do not have sufficient information for the analysis, take another look at the manual, consult the student’s handbook or contact the facilitator.

Quality assurance and management in small-scale agro-industries

UNIT FIVE

LIST OF TOPICS

1. Setting the context
2. Case study: Managing Quality in Food Retailing. Tesco, United Kingdom
3. Case study analysis
4. Total quality management
5. Quality standards and assurance schemes
6. Traceability and due diligence
7. HACCP system
8. Conclusions on the case study
9. Group exercise
10. Summary
11. Unit assessment

Points to remember



How do you define quality? Are you aware that nowadays it is essential to satisfy not only the consumer's demands, but also the legislative quality requirements? Do you know how ISO works, and what are some of its requirements? Do you know the concept of traceability and what is its real importance? What are the stages of HACCP? What are the critical control points? What is the main element for any quality assurance scheme throughout the all stages or operations?

Total quality management is an approach to quality extending to every activity. It aims to create an environment, which allows the complete participation by everyone involved to improve their performance.

**By the time you complete this unit
you will be able to:**

- 🔗 Understand quality assurance as a management concept
- 🔗 Know about international quality management and assurance systems
- 🔗 Understand traceability systems including hazard analysis
- 🔗 Understand Hazard Critical Control Points.



Setting the context

Consumer safety is one of the most critical and priority issues for products. However, as economies develop quality assurance has begun to focus not only on safety, which is expected, but also to increasingly higher demands for consistently better perceived quality. Customers' expectations and perceptions such as taste, smell, freshness and visual appearance have become of ever increasing importance. Other consumers might also consider, country of origin, production systems, packaging, nutritional value and even ethical production factors.

Quality may be perceived in a number of ways. Broadly it is defined as 'the degree of excellence in a product or system' and needs to focus on three key areas:

- fitness for the purpose for which it is to be used;
- safety;
- customer expectations and perceptions.

Very few customers tolerate inferior goods or services. It is necessary to ensure a consistent product every time in order to develop long term and trustworthy customer relations. This requires the establishment of detailed standards for an organization so as to be able to produce and market a product consistently and everyone within the organization has to be trained to meet these standards.

The most important components of a quality system are:

- the commitment to quality management by management, owners and staff;

- the training and development of all persons in their roles and responsibilities;
- a focus on problem prevention, problem solving and continuous improvement;
- a documented system that can be easily followed and modified as required.

Case study: Managing Quality in Food Retailing. Tesco, United Kingdom

INTRODUCTION¹

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

DISCUSSION

All foods are tested for micro-biological and chemical standards and the company carry out more than 10 million checks on food annually and more than 2 000 suppliers worldwide are visited by trained food and safety quality experts to make sure the food meets the supermarkets requirements. The retailer has strict guidelines for suppliers and carries out regular audits to ensure they are being followed.

CONCLUSION

Increasingly this includes adherence to Hazard Analysis Critical Control Point (HACCP), quality assurance schemes and traceability following agreed procedures and standards for produce identification and documentation. Increasingly this includes a requirement for implementing traceability systems by means of automated data capture, electronic data processing and electronic communications in partnership with growers, packers, importers and exporters and to reduce paper based administration and associated costs and using EAN-UCC standards.

This requires all members of the chain to keep records of serial numbers of logistical units (SSCC), identification numbers (GTIN) and information on traded units and location details of their origin (GLN). The company is now piloting schemes for identification of individual fruit and vegetables and has plans for further supporting the development of radio frequency identifiers.

¹ Adapted from: FAO. Agri-business management for small and medium sized businesses in Bulgaria. Part II Training approaches, case studies and exercises.

Case study analysis

Based on your personal experience, consider the following questions on the proposed case:

1. What is Tesco philosophy? What is Tesco doing in order to achieve its philosophy?

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2.-What is Tesco requesting from its suppliers in order to ensure the retailer’s strict guidelines are being followed?

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3. - Whose responsibility is to assure food safety in the agrofood chain ?

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4. - Do you think HACCP system could be implemented in a retailer shop? In your opinion which could be the critical control points in a shop?

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Bear in mind that at the end of the unit you will be asked to answer the same questions in the light of the new knowledge you will have acquired.

Total quality management

Continuous improvement is an important component to improving overall product quality, particularly as technical innovation develops. Total quality management (TQM) is not a standard but a management philosophy aimed at ensuring what should be done regarding quality management. Total quality management is an approach to quality extending to every activity. It aims to create an environment which allows the complete participation by everyone involved to improve their performance. Quality is no longer perceived as the sole responsibility of a quality control unit that monitors quality at particular stages in the production and marketing chain. Quality now requires every team member to participate in achieving customer satisfaction, quality and safety.

Total quality management is a powerful concept demanding commitment, communication, and culture change, leadership, and employee involvement. The potential rewards are improved performance and reduced costs. TQM empowers everyone to do everything “right first time” and eliminates crisis management. Total quality management is an organizational culture that needs:

- the total commitment of senior management;
- an organizational aim of customer satisfaction;
- continuous improvements in all products, processes and services;
- the involvement of everyone in the organization;
- continuing reductions in the costs involved in improving quality;
- the commitment to quality management by all management and staff;
- a focus on problem prevention, problem solving and continuous improvements;
- a documented system that can be easily followed and modified as required.

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

Leadership

- formulating a vision;
- communicating and sharing the vision;
- taking clear cut and positive actions in decision making;
- facilitating and enabling change.

Customer satisfaction goal

- appreciating customer needs;
- satisfying changing needs;
- providing specifications and timescales;
- maintaining contacts with customers and clients;
- following up to ensure that customers are satisfied.

Sustainable and continuous improvements

- looking at what competitors* are doing;
- encouraging new ideas.

Involving everyone

- viewing the workforce as a valuable resource;
- encouraging teamwork to meet the organizations objectives.

Investing in developing new talents

- investing in developing appropriate skills at all levels and maximizing the contribution of each individual to help in achieving the organizational objectives.

Measured improvements

- being commercially driven;
- focusing on improvements in customer and client satisfaction;
- involving all staff and allowing them to share in the rewards.

Quality requires every team members participate in achieving customer satisfaction, quality and safety

Quality standards and assurance schemes

All producers, but especially exporters need to be aware not only of consumers demand but also of laws on quality standards. Government regulations include health and safety, environmental issues, product labelling, packaging and are manifested in national legislations. Over 20 quality assurance schemes operate in Europe alone plus a number of industry codes of practice, retailer schemes and certification systems. Many are voluntary and have been developed by industries to establish standards for a wide range of products. International schemes are highlighted below.

THE INTERNATIONAL ORGANIZATION FOR STANDARDIZATION (ISO¹)

Is a network of national standards institutes from 148 countries working in partnership with international organizations, governments, industries, businesses, and consumer representatives. *ISO 9000* and *ISO 14000* are the most known standard “families”, *ISO 9000* covering quality management and *ISO 14000* aimed at environmental management. *ISO 9000*² was initially implemented by the food-processing sector but has been extended into other industrial areas. It is primarily at preventing and detecting nonconformity during production and supply and implementing the means to prevent its recurrence. The *ISO 9000* standard requires an objective evaluation in a business of organizational structures, administration and operational procedures, personnel, equipment and material resources, work areas, operations and processes, conformations to standards and specifications, documentation reports and record keeping.

However, this standard is not specific to the food industry and does not take into account food process specificities, especially in regard to food safety issues. In this context, ISO developed in August 2005 the *ISO 22000* standard (“Food safety management systems – Requirements for any organization in the food chain”) specifically for food safety management systems. However, the *ISO 22000* standard only specifies requirements on quality management systems and HACCP systems, and not on good practices.

The ISO quality system outlines 20 requirements that have to be specifically detailed and monitored and in relation to:

- management responsibility;

¹<http://www.iso.ch/iso/en/ISOOnline.frontpage>

²<http://www.iso.ch/iso/en/iso9000-14000/iso9000/iso9000index.html>

- the documented quality system;
- contract review;
- design control;
- document and data control;
- purchasing (materials, skills and services);
- control of customer supplied product/data;
- product identification and traceability;
- process control;
- inspection and testing;
- inspection, measuring and test equipment;
- inspection and test status;
- control and non-conforming product;
- corrective and preventative action;
- handling, storage, packaging, preservation and delivery;
- quality records;
- internal quality audits;
- training;
- servicing*;
- statistical techniques.

THE EUROPEAN NORM STANDARDS (EN) 45000 SERIES

Primarily focuses on environmental standards but is expected to become an increasing feature of assurance schemes. Accreditation to the EN 45011 standards is already a requirement for organic and geographically designated foods and farm assured products. Important standards for agri-business are the operation of inspection bodies; testing laboratories; product certification; quality management certification.

THE CODEX ALIMENTARIUS¹

Is a collection of food standards, codes of practice, guidelines and other related texts. The Codex Alimentarius Commission was created in 1963 under the Joint FAO/WHO Food Standards Programme. Codex standards represent agreements between member countries and are not therefore intended to lead to certification programmes. As international trade has grown, it works to promote harmonization of food standards in order to protect health of consumers and ensuring fair trade practices in food trade. Codex standards gained particular importance in 1995 with

¹<http://www.codexalimentarius.net/>

the establishment of the World Trade Organization (WTO) and its Agreement on the Application of Sanitary and Phytosanitary Measures (SPS Agreement), which recognizes Codex as the reference in trade disputes in food safety measures. In 2005, Commission membership comprised 171 countries.

Additionally to these international schemes, each country has established its own standards, in particular USA and the European Union, for their own producers and for importers. More recently private standards are also proliferating, such as the ones elaborated by the following organizations:

THE EUROPEAN RETAILER PARTNERSHIP (EUREP)¹

Is a voluntary subscriber organization established in 1998 and aims at establishing a global standard called EurepGap. It provides certificates to individual growers or produce marketing organizations using objectively verifiable criteria covering traceability and record keeping, seed varieties and rootstocks, site and soil management systems, fertilizer and chemical usage, irrigation, health and safety, post harvest handling, customer feedback/complaints and internal auditing systems. Certified producers or groups are subjected to announced and unannounced inspections from monitors certified through the scheme.

THE GLOBAL FOOD SAFETY INITIATIVE (GFSI)²

Was established to attempt to endorse various national food safety schemes and standards into one set of criteria. Compliance with all key elements leads to the endorsement of the standard and subsequent acceptance by buyers. This would enable schemes in different countries to become verified as equivalent to standards that buyers are already aware.

Traceability and due diligence

Phytosanitary issues have become paramount for the food industry. The necessity to trace produce from the grower through the entire market chain has gained ultimate importance in recent years. Wider environmental implications such as chemical applications and pesticide residues, food hygiene, ethical trade and production methods also need to be taken into consideration in order to comply

¹ http://www.eurep.org/sites/index_e.html

² <http://www.globalfoodsafety.com/>

with quality assurance systems. For example, the *European Food Safety Authority (EFSA)*¹ coordinates a new European food law since 2005. Individual countries maintain their own national responsibility for implementing national standards.

An effective and cost-efficient traceability system can pinpoint problems to a specific production area, packing facility, supplier, association or grower. The system is designed to strengthen a businesses' ability not only to demonstrate due diligence but also to give participants in the scheme a clear marketing advantage. Consumer assurance schemes have been created in several countries and have become very popular.

Farmers or food processors have the primary responsibility for food safety. In case of a food safety incident, the seller of the product has to prove that a process of “due diligence” has been followed. The seller must prove that produce has been handled correctly throughout its life. Due diligence means that the following two rules must be followed:

- to take all reasonable precautions. This means identifying the potential risk and having means in place to prevent or reduce it;
- to keep records available to prove that everyone in the agrofood chain has taken the appropriate action to avoid potential risks to food safety.

Risks to consumer health and safety can result from a range of activities such as:

Physical hazards: from staples (from packing boxes), nails, screws, and bolts, pieces of glass and wood splinters.

Chemicals hazards: from pesticides, fungicides, herbicides, foeticides, lubricants, heavy metals (lead, mercury, arsenic), cleaning and sanitizing materials.

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

Good management is therefore required throughout the production and distribution processes to prevent physical, chemical, human and environmental pathogen contamination.

Product traceability has become particularly important for food products in order to conform to European food safety legislation and to deal with the diversity of international production and supply chain practices. Integrated

¹ http://europa.eu.int/comm/food/index_en.htm

systems of supply are under development that link producers with traders and supermarkets through crop monitoring, Good Agricultural Practice (GAP¹), controlled production and detailed record keeping through from production to retail sale.

The EAN International and the Uniform Code Council have developed a set of tools and a standard approach² for identifying, tracking and tracing products and so that one label can be used by suppliers, distributors and customers throughout the supply chain. Supply chain management is assisted by physically marking goods with electronic tags (bar codes).

Such systems require links between successive intermediaries and for identification numbers and recording systems to be properly applied. The efficiency* of the system depends upon the reliability of the weakest link in the chain, but once the system functions, all products may be quickly identified using unique and globally recognizable tags. These tags are assigned by a national numbering organization and normally a number can only be re-used for another product when at least four years have elapsed since the product was last supplied. Global location numbers can be allocated to companies, accounting departments, warehouse areas, delivery points, transmission points and even individuals if necessary. Suppliers must notify their customers on such unique identifying numbers.

Most retailers and almost all supermarkets now use *electronic point of sale systems (EPOS)* to electronically manage both sales and available stock. Bar codes on is the standard method of showing product data in a machine readable format. Bar coding links producers and traders and enable electronic data interchange and so cut down on wrong deliveries. They help to streamline stock processing; they enable savings in inventory management and improve cash flow. Each bar code has a unique code number for each different product, type, supplier, colour, size, packaging, etc.

¹ <http://www.gaps.cornell.edu/>, http://www.gaps.cornell.edu/pubs/Farm_Boo.pdf: food safety for fruit and vegetable growers, <http://ucce.ucdavis.edu/files/filelibrary/5453/4362.pdf>: self audit for growers and handlers

² <http://www.ean-int.org/agro-food/Opmaak%20tekst%20Fresh%20Produce%20.pdf>: fresh produce traceability guidelines

HACCP system

The *Hazard Analysis Critical Control Point (HACCP) system*¹ has gained in importance and is the most effective tool for putting due diligence into practice. HACCP is a structured and preventative system for control of all food safety hazards. It has been legitimized by the Codex Alimentarius Commission, who incorporated the HACCP guidelines into its food hygiene code.

The HACCP system is an important component of most developed countries and needs to be fully understood.

The HACCP concept is based on seven principles:

1. Conduct a hazard analysis: collect and evaluate information on hazards and condition leading to their presence to decide which are significant for food safety;
2. Determine the Critical Control Points (CCPs): identify for each hazard the steps at which control can be applied and is essential to prevent or eliminate the hazard or reduce it to an acceptable level;
3. Establish critical limit(s): establish for each CCP a criterion which separates acceptability from unacceptability;
4. Establish a system to monitor control of the CCP: establish a planned sequence of observation or measurements of control parameters to assess whether the CCP is under control;
5. Establish the corrective action to be taken when monitoring indicates that a particular CCP is not under control: establish the actions to be taken when results of the monitoring of the CCP indicate a loss of control;
6. Establish procedures for verification to confirm that the HACCP system is working effectively: establish methods, procedures, tests and other evaluations, in addition to monitoring, to confirm that the HACCP system is effective;
7. Establish documentation concerning all procedures and records appropriate to these principles and their application.

The first step is to draw up a flow process chart describing the operation in its various stages. At each stage the nature of the risk that is likely to occur, has to be described and a risk reference number needs to be allocated. The follow up action sheet is then compiled from the flow process chart with cross reference to the

¹<http://www.fao.org/docrep/W8088E/W8088E00.htm> : FAO Training manual on Food hygiene and HACCP system.

stage of process and risk reference number. Critical control points are processes or actions, which need to be controlled to eliminate or reduce a hazard to an acceptable level. Hazards may include biological, chemical or physical properties with the potential to cause harm, such as:

Critical control points		
Microbiological	Physical	Chemical
Pathogenic bacteria	People	Raw materials
Parasites and protozoa	Equipment	Process
Viruses	Environment	Packaging
	Pests	Cleaning
	Natural materials	

A company needs to estimate the likelihood of the occurrence of a hazard. Then it has to be judged whether the hazard is of high concern (life threatening risk), of medium concern (threat to the consumer which must be controlled) or of low concern (little threat to the consumer but it may be advantageous to control it). A risk reference number is allocated to every potential risk. Every member of the food chain who handles the product needs to be aware of contamination risks and need to take appropriate action to avoid these risks.

Record keeping as the main element of any quality assurance scheme is essential in all stages involved getting a product from the producer to the final consumer. For example, the agricultural producer needs to keep pesticide records and the subsequent packer needs to keep records on the classification of the received produce. Records have to be written clearly, dated and signed by the person entering the data. Regular self-audits are required to check and ensure that operating standards do not fall below the stated level.

Product quality control reports at each stage will need to be prepared on:

- the product and variety;
- date of receipt, time of receipt and inspection;
- source, supplier code or name;
- total consignment and total inspected;
- weight (or count) of outer and net weight of contents;
- temperature on receipt;
- quality and condition of product;

- decision - accept, reject (give reasons), accept (with proviso for further sorting).

A production work sheet needs to be prepared which provides information on the raw material to be used, its source, the quantity to be produced and the essential final product information (weight or count per item, grade, size and labelling information). Raw materials from approved suppliers only can be used to assure traceability. Packaging, equipment and materials used throughout the production process must also meet the specifications or requirements laid down by the customer or by respective legislation.

HACCP procedures are summarized into a product management manual and which has to be made available for inspection at any time. The product management manual is an essential first step for any business establishing a quality assurance system. It includes background information on the business and its management in particular:

- a statement of the company quality policy: This shows a general commitment to quality and has to be consistently promoted to team members and customers;
- the procedures to be followed in order to ensure a consistent quality of product and covering all aspects of the process;
- management and team member responsibilities: Who does what and who reports to whom? A team member structure chart gives an outsider a clear picture of how the business is managed. Clear lines of responsibility must be shown and the chart needs to be updated when the business grows and personnel change. A short statement of the responsibilities of each member of management is required;
- company information data sheet: A single page format for all customers to enable quick and effective communications. It is important to ensure that this sheet is kept up to date;
- record keeping systems as evidence that the quality system works.

The preparation of a product management manual is the responsibility of the company. It introduces and develops the concept and philosophy of total quality management in all operations. It acts as a guide, ensures product safety and provides an assurance of quality. As a document, the management manual aims at meeting individual product and customer product specifications, legal requirements of particular countries, and can also be used as a training manual for staff.

Example: Process chart showing potential hazards and CCPs in sauce production

Stages in process	Potential hazards	Level of risks and measures to address risks	CCPs
Fruit Wash/ Sort	Mouldy fruit, contamination with soil, leaves, etc.	High risk: mould contamination could affect flavour and shelf life of product. Moderate risk: extraneous matter as insects could contaminate product if no removed during inspection. Low risk: cosmetic faults in fruit, other contaminants that would be removed later in the process.	No mouldy fruit or insects contamination
Peel	Seeds and skins not removed		No peel or seeds in product
Pulp	Metal contamination	Low if machines are regularly inspected.	No foreign matter in product
Mix	Contamination of spices with dust, mould, bacteria or foreign bodies. Correct pH of mixture	High risk: shelf life depends on correct mixture of acid, salt and sugar. Ingredient weight should be checked. Moderate risk: contamination of spices. Remove mouldy items and other contaminants during inspection and washing. High risk: incorrect pH. Product depend, in part, on acidity for preservation. Check pH.	Corrects ingredients weights +/-5 percent Correct pH +/-0.2 units, no mouldy or contaminated spices
Heat	Insufficient heating	High risk: adequate heating is needed to destroy enzymes and contaminating micro-organisms and produce required consistency in product. Check time and temperature of heating.	Heating at 100 C. for 20 minutes +/- 5 minutes
Fill/Seal	Faults in glass Inadequate seals	High risk: faults in glass could injure consumers. Check by 100 percent inspection in bottles. High risk: fault seal on cap could allow re-contamination. Check caps are correctly sealed.	No glass faults. No faulty caps seals. Fill weight 305 +/- 5g (Net weight on label = 300g)
Pasteurize		High risk: Inadequate pasteurization results in spoilage during storage.	Pasteurize at 88 C +/- 2 C for 20 minutes +/- 2 minutes

Other components of a quality assurance plan include:

- cleaning schedules for buildings and equipment to prevent contamination;
- cleaning procedures to remove wastes from processing rooms as they arise;

- planned maintenance of equipment to prevent parts falling off into foods;
- training operators in correct personal hygiene and food handling techniques;
- proper cleaning of equipment, floors, tables, etc. is essential to all food processing; and this can be monitored and controlled using cleaning schedules as part of a QA plan.

The schedule records which cleaning jobs are allocated to each worker, the time required, the cleaning materials involved in doing each job and the expected standard of cleanliness to be achieved. The worker should initial the schedule report when a cleaning job is finished and checked and it should then be countersigned by a supervisor, manager or business owner.

Checklists help to manage quality control. The list below is an example of a checklist for a food processor.

Example of a checklist

Daily	<ul style="list-style-type: none"> Check raw materials Check processing conditions Check packaging materials, fill weights and quality of seals Clean processing equipment and factory floors Clean toilets and washrooms
Weekly	<ul style="list-style-type: none"> Check equipment for loose and worn parts Clean storerooms and others non production areas Check and clean drains Send protective clothes to laundry Check stocks for signs of damage
Monthly	<ul style="list-style-type: none"> Clean windows Check machinery for service requirements Do full stock check of ingredients and packaging materials Check measuring equipment to ensure it is accurate
Yearly	<ul style="list-style-type: none"> Review QA procedures, staff training and recording systems to ensure that they remain appropriate to the needs of business

Conclusions on the case study

Having compared your prior knowledge with the subject content of the unit, answer the following questions making optimum use of the new knowledge you have acquired.

1. What is Tesco philosophy? What is Tesco doing in order to achieve this philosophy?

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2. What is Tesco requesting from its suppliers in order to ensure that the retailer's strict guidelines are being followed?

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3. Whose responsibility is to assure food safety in the agrofood chain ?

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4. Do you think HACCP system could be implemented in a retailer shop? In your opinion which could be the critical control points in a shop?

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.....

Group exercise

A shop retailer needs to estimate the hazard during all the process and operations. The group must identify which are the critical control points, and develop a HACCP exercise considering the three stages of system:

1. Identification of the potential hazards.

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2. Decision on which of them are critical control points.

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3. Establishment of control, documentation and verification procedures of each critical point.

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The group will use the process chart showing the potential hazards and CCPs, used for the example of sauce production.

Summary

- Customer expectations and perceptions including food safety have become of ever increasing importance in the case of food products.
- Total quality management is an approach to quality extending to every activity during the process of production.
- Total quality management guiding principles are: leaderships, customer satisfaction goal, sustainable and continuous improvement, involving everyone, investing in developing, new talents, measured improvements.
- ISO, EN, EUREP, GFSI, are some of the widely recognized schemes of quality standards and assurance.

- Product traceability is becoming important for food products, in order to conform to European safety legislation and to deal with the diversity of international production and supply chain practices.
- By using HACCP a product is traceable through its production and marketing chain.
- HACCP is a system used to identify potential hazards and critical points in the chain production and controls for each critical point.
- A product management manual of a company is an important element for staff training.

Unit assessment

Answer the following questions on additional sheets of paper:

1. What is the real importance of quality management? Mention some causes of failure related to deficient quality management.
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2. Define traceability and explain its importance.
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.....
3. What are standard families of ISO? Is your business using those standards?
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.....
4. What is the classification of hazards to consumer health and safety? Mention one of each type.
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.....
5. Define HACCP.
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.....
6. What is the importance of keeping records in quality assurance? Mention at least three important records?
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If when attempting to answer these questions you have any doubts or feel that you do not have sufficient information for the analysis, take another look at the manual, consult the student’s handbook or contact the facilitator.

Glossary

Airway bill

Equivalent to a bill of lading, the airway bill and the title to the goods automatically go to the consignee who can take possession when goods arrive.

Bill of lading

Issued by an ocean carrier, it is a receipt* for goods and contract for carriage, it gives title to the goods and signed copies are proof of ownership.

Bottleneck

A hold-up caused when one part of a process is slower than others, one piece of equipment is smaller than the others, or there are too few staff working in a particular part of a process.

Break-even point

The level of production at which all costs are covered.

Cash flow

The record of monies received and paid by the company.

Certificate of origin

This is usually handled by a shipping agent and standardized forms are used.

Commercial invoice

Sales document which includes standard information (date of issue, name and address of buyer and seller, contact number, description of goods, unit price, number of units, packages, total weight, terms of delivery and payment).

Competitor

Another business selling similar types of products to the same target customers.

Consumer

The person or household who is the final buyer of a product.

Creditors

People who are owed money by a business.

Customer

A person, firm or institution who buys a product.

Debtors

People who owe money to a business.

Demand

The amount of goods that customers want or need to buy.

Depreciation

Decrease of value of capital equipment due to wear and tear and the passage of time.

Efficiency

A measure of the amount of production from a certain level of inputs.

Equity finance

Money put into a business by the owner.

Export permits

From the Government of an exporter.

Feasibility study

Systematic investigation of an idea for a new product or process to see if it can work – i.e. to see if it is feasible.

Fixed costs

Costs of production that do not vary with the amount of goods produced.

Fumigation certificate

Some countries expect such a certificate for products of agricultural origin.

Inventory

Amount of inputs, unfinished and finished products at a given time.

Investment

Putting money, fixed and current assets into a business.

Invoice

A bill requesting payment.

Market size

The total amount of a product that is bought per month or per year in volume or value terms.

Marketing

The series of activities to identify customers and then satisfying their needs by providing them with the products they want.

Order

A written request for goods or services.

Packing list

Sometimes required to supplement the packing list.

Panela

Food product elaborated from sugar cane.

Phytosanitary certificates

Sanitary and other certificates are required for some types of products; examples include plants, seeds, nursery stock and many other foods.

Planned maintenance

A written schedule showing when particular pieces of equipment should be serviced.

Profitability

Income minus expenses.

Proforma invoice

A delivered cost estimate usually required for a successful sale.

Production planning

Calculating and predicting the number and amount of inputs needed to make a product.

Productivity

Output per unit cost.

Promotion

A set of activities to raise awareness of a product and increase sales.

Receipt

A written acknowledgement of payment

Recruitment

A planned and structured way of finding and employing people.

Revenue

Income derived from product sales and from other sources such as interest rents etc.

Servicing

Planned inspection and maintenance of equipment.

Staff development

Training and other means of increasing a person's effectiveness to do a job.

Stock

Materials waiting to be used or sold.

Variable costs

Costs of production that vary according to the amount of goods produced.

Yield

Weight of food after processing compared to weight before processing.

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Exchange rates: local currency to 1 US dollar. December 2006			
China	...	RMB Yuan	7.8
India	...	Rupees	46.00
Indonesia	...	Rupiah	11 000
Malaysia	...	Malaysia Ringgit	3.5
Japan	...	JapYen	121.1
Philippines	...	Pesos	48.5
Thailand	...	Baht	40

