



Higher National Unit specification

General information for centres

Unit title: Food Manufacturing: Post Manufacturing Practices within the Food Chain

Unit code: F8L6 35

Unit purpose: This Unit is designed to enable candidates to assess the factors which influence the stages in the food chain following the manufacture of a food product. It enables candidates to evaluate the factors affecting the selection of packaging material used in the food industry and to carry out practical tests to determine the effectiveness of packaging methods. In addition, it enables candidates to explain the impact that distribution (including retailing) can have on manufacturing in the food industry. On completion of the Unit the candidate should be able to:

- 1 Evaluate factors affecting the selection of food packaging materials.
- 2 Explain the relationship between manufacturing and distribution in the food industry.

Credit points and level: 1 HN credit at SCQF level 8: (8 SCQF credit points at SCQF level 8*)

**SCQF credit points are used to allocate credit to qualifications in the Scottish Credit and Qualifications Framework (SCQF). Each qualification in the Framework is allocated a number of SCQF credit points at an SCQF level. There are 12 SCQF levels, ranging from Access 1 to Doctorates.*

Recommended prior knowledge and skills: Access to this Unit will be at the discretion of the centre. However, it would be beneficial if candidates had some background in the principles of food manufacturing, which could be demonstrated by relevant practical experience or the achievement of relevant Units at SCQF level 7, such as:

- ◆ F6VG 34 Food Manufacturing: Processing Practices at Ambient Temperatures
- ◆ F6VJ 34 Food Manufacturing: Processing Practices at Sub-Ambient Temperatures Practices
- ◆ F6VH 34 Food Manufacturing: Processing Practices at Elevated Temperatures

Core Skills: There are opportunities to develop the following Core Skills components in this Unit: *Written Communication* (Writing) at SCQF level 6; *Numeracy* (Using Number) at SCQF level 6; *Problem Solving* (Critical Thinking) at SCQF level 6; *Problem Solving* (Reviewing and Evaluating) at SCQF level 6. There is no automatic certification of these Core Skills components.

Context for delivery: If this Unit is delivered as part of a Group Award, it is recommended that it should be taught and assessed within the subject area of the Group Award to which it contributes.

Assessment: Assessment of this Unit could be achieved through reports or a combination of reports and other forms of presentation such as the use of presentation software. Where candidates present the results of their practical work in a report, they should use suitable report format. An observation checklist can be used to record the achievement of practical skills.

Higher National Unit specification: statement of standards

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The sections of the Unit stating the Outcomes, Knowledge and/or Skills, and Evidence Requirements are mandatory.

Please refer to *Knowledge and/or Skills for the Unit* and *Evidence Requirements for the Unit* after the Outcomes.

Outcome 1

Evaluate factors affecting the selection of food packaging materials

Knowledge and/or Skills

- ◆ Relationship between processing and packaging operations
- ◆ Packaging criteria
- ◆ Packaging materials
- ◆ Types of packaging
- ◆ Tests on packaging materials

Outcome 2

Explain the relationship between manufacturing and distribution in the food industry

Knowledge and/or Skills

- ◆ channels of distribution
- ◆ retailing in the UK
- ◆ retail marketing

Evidence Requirements for the Unit

Candidates will need to provide written/oral and practical evidence to meet all the Knowledge and/or Skills items by showing that they can:

- 1 evaluate the factors affecting the selection of food packaging materials in three different situations in the food industry: the evaluation should include the following:
 - ◆ valid reasons to explain the organisation and flow of processing and packaging operations
 - ◆ valid reasons to explain how the food packaging materials used are fit for purpose in the particular situation
 - ◆ an assessment of the advantages and disadvantages of the type of packaging used
- 2 draw conclusions from tests to evaluate packaging. For this candidates should:
 - ◆ carry out four suitable tests to evaluate packaging: these should include at least one test on rigid packaging material and at least one test on flexible packaging material.

Higher National Unit specification: statement of standards (cont)

Unit title: Food Manufacturing: Post Manufacturing Practices within the Food Chain

- ◆ perform all required calculations on the data from the tests and present it in a suitable appropriate format using graphs and tables where appropriate
- ◆ draw reasoned conclusions about the extent to which the packaging is suitable for the food type and offers protection to the food

Candidates should prepare and set up equipment in an appropriate manner for each test. They should deploy suitable practical techniques in accordance with prevailing safety and hygiene requirements and ensure that their work produces accurate results. To ensure that candidates meet these requirements, they should be observed on all occasions. A record should be kept of each observation. Candidates should also keep records of the results of each practical exercise. Candidates should also provide a full report on one of the practical tests to evaluate packaging. The report should be presented in a suitable format.

- 3 provide valid reasons to explain the relationship between manufacturing and distribution and retailing in the food industry: the explanation should be based on examples of three food products and should include reasons to explain:
 - ◆ why different distribution channels are used
 - ◆ the role of different types of retail outlets for food products and the advantages and disadvantages of different outlets with respect to each example
 - ◆ the use of different types of marketing in retailing and the advantages and disadvantages of different methods with respect to each example
 - ◆ the impact of distribution channels, different types of retail outlets and different methods of retail marketing on the activities of food manufacturers

Assessment Guidelines for the Unit

Candidates could present evidence in a number of ways to show that they can evaluate the factors involved in selecting packaging materials for food products and in choosing suitable packaging equipment. They could provide a short report, develop a poster presentation or use presentation software. Alternatively, candidates could be given questions and could present their work as responses to these questions.

An observation checklist can be used to record the observation of the tests which candidates are expected to perform. It can cover items such as practical skills deployed and safe laboratory practice. Candidates could be asked questions about the work they have done to supplement the observation checklist.

Reports should be presented in a suitable format which could be along the following lines:

- ◆ Title and Date
- ◆ Aim/Introduction, including relevant theory
- ◆ Materials and Methods
- ◆ Results including tables, calculations and graphs
- ◆ Evaluation
- ◆ Conclusions
- ◆ References

Administrative Information

Unit code:	F8L6 35
Unit title:	Food Manufacturing: Post Manufacturing Practices within the Food Chain
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Version	Description of change	Date

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Higher National Unit specification: support notes

Unit title: Food Manufacturing: Post Manufacturing Practices within the Food Chain

This part of the Unit specification is offered as guidance. The support notes are not mandatory.

While the exact time allocated to this Unit is at the discretion of the centre, the notional design length is 40 hours.

Guidance on the content and context for this Unit

This Unit is designed to enable candidates to assess the factors which influence the stages in the food chain following the manufacture of a food product. It enables candidates to evaluate the factors affecting packaging in the food industry and to carry out practical tests to determine the effectiveness of packaging methods. It also enables candidates to assess the impact of distribution and retailing on manufacturing in the food industry.

It covers the next stages in the food chain after the manufacture of the food product ie those involved in moving a food product from the manufacturer to the point of sale. This includes movement of goods from the manufacturer (distribution) and the ways in which they are made available to the final consumer (retailing). Candidates are expected to consider factors affecting the choice of distribution channel as well as the diversity and development of the retail sector in the UK. Both can impact substantially on manufacturing — as well as setting product specifications, eg major retailers may also set conditions for distribution and on packaging and presentation of the food product. Some speciality products may be deliberately sold through specialist food outlets such as delicatessens.

Distribution, retailing and packaging are closely related and the Unit covers all three. Packaging of food is affected by a very wide range of scientific, economic, legal, political and cultural factors. Packaging may be affected by the composition of food (scientific), the requirements of retailers and consumers (economic), government intervention (legal and political), attitudes to waste, recycling, biodegradability and minimalisation (cultural) — all factors which may overlap. Decisions about how to package food products are, therefore, complex as well as being of critical importance to the food industry. The Unit introduces candidates to these complexities by requiring them to consider different types of packaging materials for food products and to conduct quality control tests on packaging. Candidates will be expected also to consider the flow and sequence of processing and packaging operations and examine how they fit together.

All stages of the post manufacturing food chain are ones which have changed considerably and are continuing to do so. Candidates should, therefore, also recognise the significance of new developments.

People who wish to work in the food industry must be fully aware of the various issues which influence distribution, retailing and packaging. This Unit therefore has a key role in preparing candidates for employment in the food industry. However, the Unit also has a practical component as candidates must perform tests to evaluate packaging properties. In this way they can develop additional practical skills which should enhance their prospects of employment in the food industry. This Unit emphasises the actual approaches which the food industry takes therefore, throughout, candidates should relate the material in the Unit to the current situation in the food industry.

Higher National Unit specification: support notes (cont)

Unit title: Food Manufacturing: Post Manufacturing Practices within the Food Chain

Candidates should already have some background knowledge and skills eg through practical experience or achieved through relevant Units at SCQF level 7 such as:

- ◆ F6VG 34 Food Manufacturing: Processing Practices at Ambient Temperatures;
- ◆ F6VJ 34 Food Manufacturing: Processing Practices at Sub-Ambient Temperatures Practices
- ◆ F6VH 34 Food Manufacturing: Processing Practices at Elevated Temperatures.

Overall, the Unit should enable candidates see the full extent of post manufacturing activities and how they are part of the chain which includes manufacturing itself.

The following gives some further details on each of the 2 Outcomes.

Outcome 1:

A crucial part of this Outcome is that packaging should be set in the context of food processing operations as a whole.

Packaging criteria — these can be considered in terms of:

- ◆ function — eg containment, protection, preservation, identification, information, market appeal, user convenience, design, cost
- ◆ selection — eg product nature, vulnerability, market requirements, legal and safety, sealing, coding, recycling, waste, physical, chemical, microbiological properties of the product
- ◆ Screening — eg visual spotters, metal detection

Packaging materials can include:

- ◆ Rigids — glass, metals, wood, plastic, fibreboard
- ◆ Semi rigids — paperboard, aluminium, plastics, moulded pulp
- ◆ Flexibles — papers, plastic films, laminates, aluminium foil, pouches
- ◆ Tamper evidence

Packaging technologies can cover:

- ◆ vacuum packaging including vacuum skin packaging (VSP)
- ◆ Modified Atmosphere Packaging (MAP) — including commonly used gases like nitrogen, oxygen, carbon dioxide; gas flushing or sparging
- ◆ active packaging materials

Packaging machinery can cover a wide range of equipment used in packaging food including:

- ◆ Filling machinery: Liquids (gravity, piston); Solids (volumetric, weight)
- ◆ Capping, closing, seaming and sealing closing machines
- ◆ Form-fill seal: horizontal, vertical
- ◆ Wrapping machinery

Higher National Unit specification: support notes (cont)

Unit title: Food Manufacturing: Post Manufacturing Practices within the Food Chain

Tests on packaging materials can cover methods such as cans, bottles, flexible packaging, ‘tetrapak’ etc. to ensure that they are good enough to offer protection to the food and are suitable for certain food types. Tests can cover tests of flexible and rigid packaging such as can seam test, seam strength test on a vacuum pack; retortable pouch; bottle torque. They can also include both visual and physical quality control tests.

Outcome 2:

The emphasis throughout this Outcome should be on the way in which distribution and retailing and changes in them impact on the activities of food manufacturers.

Channels of distribution: directly to consumer; retail outlets, wholesalers; factors affecting the choice of distribution channel, eg perishability; handling (costs, difficulty); convenience goods; value of goods.

Retailing in the UK can cover the characteristics of the retail sector in the UK and the way it has developed and is developing. Candidates should be aware of the diversity of the retail sector and how this affects the way in which consumers obtain food products.

Characteristics of retail sector: supermarkets, garages, department stores, specialists, independents, stalls, travelling shops, farm shops, carry out providers, e-retailers.

Developments in retail sector: social change; changes in food consumption; changes in technology such as real time processing.

Retail marketing can include factors such as: use of Electronic Point of Sale (EPOS); pre-entry psychological factors; store layout (including aisles and eye-level, superabundance); product distribution; specific in-store sales (such as discounts); in-store demonstration; media advertising; special offers; packaging attractions (bright, unusual, convenient, specialist, environmentally friendly, properties and functionality).

Guidance on the delivery and assessment of this Unit

Delivery Guidance:

This Unit can be delivered in the context of actual practice in the food industry. Wherever possible, candidates should relate the material to specific situations in the food industry. The Unit lends itself to a case study approach and use can be made of actual examples of distribution, retailing and packaging, in particular those with which candidates are very familiar. Candidates should be encouraged to make use of any experience that they have of food processing companies and of their own experiences as consumers and users of retail outlets. They can also be encouraged to undertake their own research into retailing and packaging, including the use of different materials, in the food industry. The use of packaging materials is constantly evolving, particularly in the light of current attitudes to recycling and waste management, so candidates can be encouraged to review and discuss recent developments. Throughout the Unit candidates should consider the ways in which distribution, retailing and packaging are connected to each other and how they are linked in to food manufacturing operations. Delivery of this Unit offers an ideal opportunity for candidates to become more aware that food manufacturing does not take place in isolation and that manufacturing operations are part of a sequence of activities which result in the purchase of food products by consumers.

Higher National Unit specification: support notes (cont)

Unit title: Food Manufacturing: Post Manufacturing Practices within the Food Chain

The Unit lends itself to research by candidates perhaps building on material covered by conventional classroom methods eg into particular ways in which a packaging material is used; how and why food products are sold in particular retail outlets. Candidates could do this individually or be allocated to small groups. They can report their findings back to other members of their cohort, perhaps through a group presentation. Depending on the available technology, candidates may be able to share information through electronic arrangements such as conference, blog or wiki.

This Unit has many links with other Units eg (F8L8 35) Food Quality Assurance and (F8L9 35) Microbiology: Food Quality and Safety within the HN Food and Science Technology framework. Where this Unit is delivered as part of this framework, candidates can be encouraged to see how the topics in the different Units are connected. As a result, this Unit can play a big part in helping candidates to recognise the ways in which the various parts of the framework are integrated and how, together, they cover all aspects of the food industry.

Assessment Guidance:

Assessment for this Unit involves both evaluative and practical work. It may be possible to combine the assessment of both Outcomes but separate assessments for each Outcome may be easier to administer and may be more readily understood by candidates.

Outcome 1 involves practical work and candidates are expected to provide a report on the tests they have performed. Candidates are expected to carry out 4 tests and should be observed on each occasion. Observation checklists can be used for each piece of practical work to ensure that candidates have performed the test accurately and followed correct health, safety and other procedures. Candidates should provide one full report of a test. It should follow a recognised format, along the lines of:

- ◆ Title and Date
- ◆ Aim/Introduction, including relevant theory
- ◆ Materials and Methods
- ◆ Results including tables, calculations and graphs
- ◆ Evaluation
- ◆ Conclusions
- ◆ References

For Outcome 2, candidates could present their assessment work on retailing in a number of different formats. It could be done in the form of a report and, if desired candidates could be asked to adopt a suitable report format. This may be useful practice for future work in industry. Candidates could make use of a poster presentation or use relevant presentation software. Depending on delivery methods, it may be possible for candidates to use a personal blog as a means of generating and presenting evidence.

Oral evidence should be recorded (eg by video) and retained.

Higher National Unit specification: support notes (cont)

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Opportunities for developing Core Skills

Communication: Written Communication (Writing) at SCQF level 6

As part of their assessment work for this Unit, candidates are expected to provide a report on the practical tests on food packaging which they carry out. This would normally be a written report in which candidates will be expected to present and analyse essential information in a logical and effective order. They will have to do this by using a structure which links the various points together and organises the content in a manner which distinguishes between explanation and evaluative conclusions drawn from the analysis. They will be expected to follow the conventions of report writing and ensure that their report is comprehensible to an industrial readership.

Numeracy: Using Number at SCQF level 6

Outcome 1 of the Unit requires that candidates perform calculations on the data that they obtain from test on food packaging materials. The tests include visual quality control tests so that candidates will be working with both qualitative and quantitative data. They will have to decide on the order in which to carry out the calculations which can be complex and will have to work to a high degree of accuracy.

Problem Solving: Critical Thinking at SCQF level 6

Outcome 1 of this Unit requires candidates to consider suitable packaging materials for food products. In order to do this, they will have to identify, and assess the relevance of, the various factors which affect the choice of materials such as market requirements, legal issues, food safety, retail requirements, recycling and waste. The factors are all inter-related and overlap and candidates will be expected to identify the various relationships between these factors and assess the extent to which they influence the choice of materials and machinery. Similarly in Outcome 2 candidates must take into account a number of inter-related factors when explaining the relationship between manufacturing and distribution in the food industry.

Problem Solving: Reviewing and Evaluating at SCQF level 6

Candidates are expected in this Unit, to carry out tests on food packaging to gather data. They are expected to manipulate the data, eg by using calculations and use the results to draw conclusions about the extent to which the packaging materials are good enough to offer protection to the food and are suitable for certain food types.

Open learning

This Unit could be delivered by Open Learning. However, candidates must be able to undertake practical laboratory work under supervised conditions, something which may be time-consuming and difficult to organise. If suitable arrangements can be made, they would have to cover assessment and quality assurance.

Higher National Unit specification: support notes (cont)

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Disabled candidates and/or those with additional support needs

The additional support needs of individual candidates should be taken into account when planning learning experiences, selecting assessment instruments, or considering whether any reasonable adjustments may be required. Further advice can be found on our website

www.sqa.org.uk/assessmentarrangements

General information for candidates

Unit title: Food Manufacturing: Post Manufacturing Practices within the Food Chain

This Unit is designed to enable you to assess the factors which influence the stages in the food chain following the manufacture of a food product. It covers distribution, retailing and packaging of food products. It will enable you to assess the impact of distribution and retailing on manufacturing in the food industry and to evaluate the factors related to the selection of packaging material used in the food industry. You will also carry out a series of practical tests on cans and flexible packaging materials to ensure that they are good enough to offer protection to the food and are suitable for certain food types.

This Unit deals with the next stages in the food chain after the manufacture of the food product — it is about making sure that food products are moved from the manufacturer and put in a place where consumers can buy them, such as supermarket or other retail outlet. A critical part of distribution and retailing is packaging as food products must be packaged in a way that both meets the requirements of distributors and retailers but is also attractive to consumers. Packaging of food involves the choice of suitable packing materials such as bags, vacuum packs, bottles, boxes or cans.

When undertaking this Unit, you will look at examples of what happens in the food industry and you may have the opportunity to find out what companies do for yourself. This Unit will also help you to extend your knowledge of firms in the food industry and the work that they do.

For the practical element of the Unit, you will have to carry out tests on packaging materials. It is important that you follow appropriate hygiene, health and safety and other guidelines when doing this work. You will be observed when doing your practical work to make sure that you perform them properly. You will be expected to collect data from the tests and to make calculations using the data.

The assessment for the Unit will require you to evaluate the selection of materials and equipment for packaging food. You will be observed during your practical work and will have to draw some conclusions from the tests you carry out. You will be asked to produce a full report on one of the practical tests. Your tutor will explain how you should present your assessment work. You will have succeeded in meeting all the requirements of this Unit if you pass the assessment.