



## Higher National Unit specification

### General information for centres

**Unit title:** Food Product Development Principles

**Unit code:** F8L7 35

**Unit purpose:** This Unit is designed to enable candidates to develop skills, knowledge and understanding of the process of new product development (NPD) in the food industry. It takes candidates from the initial stages of the development of a new food product to later aspects of testing and bringing the new product into commercial production.

On completion of the Unit the candidate should be able to:

- 1 Plan the development of a new food product
- 2 Select product testing methods for a new food product

**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 knowledge and understanding of food processing. This could be demonstrated by relevant practical experience or the achievement of 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

It would also be beneficial if candidates had knowledge and understanding of key principles of food science. This could be demonstrated by the completion of Units at SCQF level 7 such as:

- ◆ F6VD 34 Food Composition
- ◆ F6VC 34 Food Analysis
- ◆ F6VL 34 Microbiology of Foods 1
- ◆ F6VM 34 Microbiology of Foods 2

**Core Skills:** There are opportunities to develop the following Core Skills components in this Unit: *Written Communication* (Writing) at SCQF level 6; *Problem Solving* (Critical Thinking) at SCQF level 6; *Problem Solving* (Reviewing and Evaluating) at SCQF level 6; *Working with Others* (Working Co-operatively with Others) at SCQF level 6. However, there is no automatic certification of these Core Skills components.

## General information for centres (cont)

**Unit title:** Food Product Development Principles

**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:** This Unit lends itself to holistic assessment. Both Outcomes could be assessed through a feasibility study where candidates set out a plan for all aspects of the development of a new food product. The feasibility study would cover all factors involved in the development of a new food product, including its commercial production and appropriate methods to test it. The project idea could be for a real or simulated product development need.

Assessment for this Unit can take several forms — eg candidates could present their work in the form of a report in a style which replicates those used by companies in the food industry. It would be possible for candidates to work in groups to undertake some of the research required. But, if this approach is adopted, each candidate would be required to produce an individual report.

## **Higher National Unit specification: statement of standards**

**Unit title:** Food Product Development Principles

**Unit code:** F8L7 35

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**

Plan the development of a new food product

#### **Knowledge and/or Skills**

- ◆ Reasons/rationale
- ◆ Stages of new product development (NPD)
- ◆ Variables
- ◆ Types of development
- ◆ Market research
- ◆ Legal and ethical considerations

### **Outcome 2**

Select product testing methods for a new food product

#### **Knowledge and/or Skills**

- ◆ Sensory tests
- ◆ Microbiological tests
- ◆ Chemical tests
- ◆ Physical tests
- ◆ Shelf-life tests

## Higher National Unit specification: statement of standards (cont)

**Unit title:** Food Product Development Principles

### Evidence Requirements for the Unit

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

- 1 Make a proposal for the development of a new food product, which should include the following:
  - ◆ valid and convincing reasons/rationale to justify the development of the new food product
  - ◆ identification of each of the stages involved in the development of the new food product and give reasons to explain:
    - the purpose of each stage
    - and
    - why it is necessary
  - ◆ reasons to explain the sequence of the stages involved in the development of the new food product: the reasons should be appropriate to the new food product, include comments on pilot scale equipment and scaling up and should:
    - show why the normal sequence of NPD has been followed
    - or
    - justify any deviations from the normal sequence of NPD
  - ◆ reasons to explain the variables involved in the development of the new product and why they are important in this particular case: the reasons should include reference to ingredients and product costing
  - ◆ reasons to explain the type of development involved in the development of the new product; the reasons should cover:
    - what the type of development will be
    - and
    - why it is important in this particular case
  - ◆ an example of a legal or an ethical consideration which may affect the development of the new product; candidates should include reasons:
    - to explain the ways in which the consideration will impact on the development of the new product
    - and
    - why it is important in this particular case
  - ◆ two examples of market research techniques which could be used to gather data about the potential of the new food product: the examples should cover both primary and secondary market research. Candidates should include reasons to explain:
    - why the chosen technique is appropriate
    - and
    - how it can be implemented and information it is likely to produce — including any limitations of both the technique and the information resulting from it.
- 2 Select an appropriate sensory, microbiological, chemical, physical and shelf life test for a new food product. Candidates should refer to at least one example of each of the five different kinds of test. For each test, they should give reasons to explain the following:
  - ◆ why the test is appropriate for the new food product
  - ◆ how the results from the test can be used to evaluate the new food product
  - ◆ any limitations associated with the use of the test and the interpretation of the results with respect to the new food product

## **Higher National Unit specification: statement of standards (cont)**

**Unit title:** Food Product Development Principles

### **Assessment Guidelines for the Unit**

This Unit can be assessed holistically, perhaps through a feasibility study where candidates propose the development of a new food product. The feasibility study could cover all items in Outcomes 1 and 2. It would, therefore, embrace all factors involved in the development of a new food product including the reasons for it, commercial production of the new product and appropriate methods to test it.

Candidates can be encouraged to choose their own project idea which could be for either a real or a simulated product development need. It would be possible for candidates to work in groups to undertake some of the research required.

Candidates could present their work in several forms, eg a report in a style which replicates those used by companies in the food industry. Candidates could be given guidance on the format and structure of the report. Where candidates carry out collaborative research, each candidate would be required to produce an individual report.

## Administrative Information

<b>Unit code:</b>	F8L7 35
<b>Unit title:</b>	Food Product Development Principles
<b>Superclass category:</b>	NH
<b>Original date of publication:</b>	August 2009
<b>Version:</b>	02

### History of changes:

Version	Description of change	Date
02	Titles of Units F6VD 34 and F6VC 34 amended by removal of numeral 1 in line with QDT agreement.	26/04/10

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## **Higher National Unit specification: support notes**

### **Unit title: Food Product Development Principles**

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 develop skills, knowledge and understanding of the process of new product development (NPD) in the food industry. The Unit is predominantly an applied Unit but it also enables candidates to grasp the underlying principles behind new product development.

Some of these principles are appropriate to the development of new products in non-food contexts but this Unit specifically and directly applies them to NPD in the food industry.

The Unit covers the initial stages of NPD which culminate in a reasoned and justified proposal for a new product. It is in this part that more general theoretical ideas, such as market research techniques, are most relevant. Later parts of the Unit, however, deal explicitly with matters which relate to new food products. These cover testing where candidates will be able to draw on knowledge from their previous studies of microbiology and food chemistry and production of the new food product. For this part of the Unit, candidates will make use of their knowledge of different methods of food manufacturing. They will get the opportunity to directly apply ideas from previous Units, particularly when considering how to scale-up pilot production.

NPD is a dynamic topic and, in the food industry especially, is something which can change very quickly, eg as consumer tastes and preferences change. This is reflected in the general nature of the Unit. It is designed to be flexible to accommodate the dynamic nature of the subject material. The Unit offers many opportunities for candidates to gain practical experience of the food industry and what it does. Candidates can research new products developed by the food industry and suggest their own new products.

The definition of a 'new' product in the food industry today should be made clear to candidates at the outset. In the strictest sense, a new food is just that — a totally new and unique product. However, the vast majority of NPD work is focused on variants of existing products and matching exercises, therefore both definitions should be deemed acceptable in the context of this Unit.

The HND Food Science and Technology is one award which includes this Unit. It is closely linked to the Unit, (F8L3 35) Sensory Development of Foods and candidates will benefit if they attempt this Unit after they have completed (F8L3 35) Sensory Development of Foods.

## Higher National Unit specification: support notes (cont)

### Unit title: Food Product Development Principles

Candidates should have some background in food science and technology, especially food chemistry and food processing. They should have achieved this through relevant practical experience or achievement of the following HN Units:

- ◆ F6VD34 Food Composition
- ◆ F6VC34 Food Analysis
- ◆ F6VL34 Microbiology of Foods 1
- ◆ F6VM34 Microbiology of Foods 2
- ◆ F6VG34 Food Manufacturing: Processing Practices at Ambient Temperatures
- ◆ F6VJ34 Food Manufacturing: Processing Practices at Sub-Ambient Temperatures Practices
- ◆ F6VH34 Food Manufacturing: Processing Practices at Elevated Temperatures

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

**Outcome 1:** Candidates should have a thorough appreciation of the reasons why a new food product is created. They should also become familiar with the terminology of new product development (NPD) such as:

- ◆ trends (ie factors such as consumer demands and pressures)
- ◆ competitors and market direction
- ◆ 'idea generation and selection' including sources of new ideas such as customer focus groups
- ◆ concept sample production (eg production of prototype samples, problems in the scientific translation of recipes)

Candidates should also recognise other factors that can affect NPD, such as raw material supply (quality and quantity); shelf-life considerations; packaging; economic factors such as the overall level of consumer demand.

Specifically, candidates should be aware of the following:

- ◆ reasons for the development of new food products: stage in product life-cycle; current product; performance and range; consumer demands; trends; competitors' products; legislation; new technology; increased efficiency; increased profit
- ◆ stages of NPD: idea generation and selection; concept sample production; commercial viability evaluation; legal requirements; ingredients selection and procurement; pilot production; product costing; packaging selection; shelf-life evaluation; marketing; scale up; launch. Candidates should be aware of the reasons why the development stages should be performed in the correct sequence but they should understand also that there may be circumstances in which the development sequence may be changed.
- ◆ variables: format, ingredients (eg source; availability; suitability; cost), process, packaging
- ◆ types of development: packaging style, pack size, recipe formulation, variant of existing product, reformulation
- ◆ market research: this should be set against the background of the general considerations involved in marketing a food product and the marketing techniques involved; candidates should know what market research is and the pros and cons of primary and secondary market research and the reasons for choosing a particular type of market research in a given situation; where appropriate cultural and/or religious issues should be included



## Higher National Unit specification: support notes (cont)

### Unit title: Food Product Development Principles

- ◆ legal and ethical considerations: nutritional labelling; FSA guidelines; recycling; sustainability; environmental issues

**Outcome 2:** In developing a new product, it should be recognised that the eventual aim of the project is to provide the consumer with a product that they are willing to purchase repeatedly thereby ensuring the viability of the manufacturing company developing the new product.

In order to achieve this goal, the product must be subjected to a number of tests. This Outcome therefore allows candidates to examine the types of product testing methods that are available, together with their relative merits and applications. Tests for a new food product could include:

- ◆ sensory tests for a new food product: acceptance/preference tests such as Hedonic rating
- ◆ microbiological tests: tests for the identification of a relevant pathogen such as Salmonella; enumeration of total viable count (TVC)
- ◆ chemical tests: tests required for the production of a Group 1 food label ie energy, carbohydrate, fat and protein
- ◆ physical tests: tests on temperature, viscosity, size
- ◆ shelf-life tests: application of relevant tests

### Guidance on the delivery and assessment of this Unit

#### Delivery

This Unit is designed for candidates on food-related courses. Although some of the elements of the Unit are appropriate to the development of non-food products, it should be taught in the general context of food product development. The delivery of the Unit should also reflect the dynamic nature of NPD in the food industry. Wherever possible, up to date examples should be used, particularly of new products which are likely to appeal to candidates and/or which candidates themselves are likely to consume.

This is a primarily a Unit which develops underpinning knowledge and understanding. Nevertheless the subject matter is of substantial practical importance to the food industry. It is possible, therefore, to adopt an approach to delivery which encourages candidates to concentrate on applying the knowledge and understanding to activities in the food industry. The application can offer candidates considerable opportunities to expand their knowledge of current developments in the food industry.

Where this Unit is delivered within the HND in Food Science and Technology, it can draw on many other Units within this award and thus provides an ideal context for candidates to understand the relevance of underpinning Units in food chemistry and microbiology — as well as reinforcing their understanding of methods of food processing. There are also opportunities in the Unit for candidates to apply their skills from other Units eg in microbiological testing. Delivery should point out these connections and, in this way, the Unit can play an important role in integrating the HND as a whole.

## Higher National Unit specification: support notes (cont)

### Unit title: Food Product Development Principles

Candidates can be asked to carry out their own research of new food products. Investigative techniques which could be used include:

- ◆ internet searches
- ◆ literature reviews, including trade publications
- ◆ telephone calls and/or questionnaires to ingredient suppliers

One key source of information about NPD is members of the food industry. Guest lecturers from food processing firms could be invited to lead a discussion on recent new products or visits to food processing firms could be arranged.

Candidates could work in small groups to conduct investigations. Groups could report their findings back to the cohort as a whole. This could be done by a group presentation or by electronic arrangements such as conference, blog or wiki. Alternatively, it is possible for candidates to work on new product suggestions of their own. Again, this could be done through small group work.

### Assessment

Assessment for this Unit can be based on a project where candidates propose the development of a new food product. This would comprise:

- ◆ the initial development proposal
- ◆ followed by the selection and justification of appropriate testing methods
- ◆ concluding with an evaluation of the commercial production of the new product

Candidates should be encouraged to choose their own new food product. This could be an actual product or one which they have thought of for themselves. Candidates may need help and guidance to make sure that they choose something which is feasible, realistic and sustainable.

For this Unit, it would be possible for candidates to work on the project in small groups, perhaps of two or three. Candidates could undertake the whole project in a group or they could collaborate on some aspects of the research.

Candidates could begin their project at an early stage of the delivery of the Unit after they have been introduced to the principles of NPD. In this way, assessment would become a natural Outcome of the learning process.

Candidates could present their work in the form of a feasibility study for a new product. This could be an actual food product or a hypothetical new product which candidates have identified for themselves. The feasibility study can be presented as a report and set out in a style which replicates those used by companies in the food industry. Candidates could be given guidance on the format and structure of the reports. Where candidates carry out collaborative research, each candidate would be required to produce an individual report.

A report may be useful practice for future work in industry but it would be possible for candidates to present their work in other formats if desired. This Unit lends itself well to a poster presentation and/or to the use of presentation software, particularly if candidates work on their project throughout the Unit. Oral evidence should be recorded (eg by video) and retained.

## Higher National Unit specification: support notes (cont)

**Unit title:** Food Product Development Principles

### *Opportunities for developing Core Skills*

#### ***Communication: Written Communication (Writing) at SCQF level 6***

As part of their assessment work for this Unit, candidates could present their project on NPD in the form of a written report. In this, 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.

#### ***Problem Solving: Critical Thinking at SCQF level 6***

All aspects of this Unit require candidates to identify factors involved in a situation, assess their relevance and develop an approach to deal with the situation. In Outcome 1, for example, they have to consider legal and ethical considerations which may impinge on NPD. In Outcome 2 they must select appropriate techniques to test a new food product and justify their choice and they must determine why a particular method of production is appropriate for the new food product.

#### ***Problem Solving: Reviewing and Evaluating at SCQF level 6***

For Outcome 2, candidates are expected to evaluate the commercial production of a new food product. This is the culmination of their project on NPD and involves drawing conclusions on what method of production will be suitable and how the production process and systems can be organised for effective output. The evaluation will require candidates to gather evidence from the pilot processing and apply this to scaling up for commercial production.

#### ***Working with Others: Working Co-operatively with Others at SCQF level 6.***

The assessment for this Unit could involve candidates carrying out their project on NPD in small groups. They could also be working in small groups to research NPDs in the food industry. When doing this, candidates will have to organise their own role in order to contribute effectively and negotiate working methods with other group members. In order for the groups to successfully complete their task, candidates will need to promote positive attitudes among their colleagues and ensure that any difficulties are overcome.

## 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.

## 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](http://www.sqa.org.uk/assessmentarrangements)

## **General information for candidates**

### **Unit title:** Food Product Development Principles

This Unit is designed to introduce you to new product development (NPD) in the food industry. The phrase 'new product' suggests a totally new and unique product. These products are important to the food industry but they tend to be in a minority. The vast majority of NPD in the food industry is, in fact, variants of existing products eg a new recipe or new packaging. In this Unit you will cover both of these types of NPD.

The Unit, as its title suggests, covers underpinning knowledge and understanding of NPD. You will be taken through all the stages of developing a new product starting with the initial idea and including testing the new product and developing suitable manufacturing processes for it.

The Unit provides many opportunities for you to gain first hand knowledge of the food industry. You will be encouraged to research new products in the food industry. NPD is dynamic and rapid so there will be plenty of opportunities to look at very recent developments and to anticipate what new products may appear in future. The Unit will encourage you to think of new products for yourself.

The assessment for the Unit will involve applying the knowledge and understanding that you have gained. You will be expected to consider the feasibility of developing a new product. The new product could be one actually introduced recently by a food company or it could be a new product which you have devised for yourself. Your tutor will explain exactly how you should present your assessment work as this could take several forms, eg a feasibility study for a new food product presented as an industry report. You will have succeeded in meeting all the requirements of this Unit if you pass the assessment.