Unit Support Notes

H6CB 75 Unit Support Notes — Food Science and Technology in the Food and Drink Manufacturing Industry (National 5)

Please refer to the note of changes at the end of this document for details of changes from previous version (where applicable).

April 2012, version 1.0

Contents

Introduction

These support notes are not mandatory. They provide advice and guidance on approaches to delivering and assessing the Food Science and Technology in the Food and Drink Manufacturing Industry (National 5) Unit.

They are intended for teachers and lecturers who are delivering this Unit.

They should be read in conjunction with:

- the National 5 Food Science and Technology in the Food and Drink Manufacturing Industry *Unit Specification*
- the National 5 Food and Drink Manufacturing Industry *Course Specification*
- the National 5 Food Science and Technology in the Food and Drink Manufacturing Industry *Course Support Notes*
- appropriate assessment support materials

General guidance on the Unit

Aims

The general aim of the Unit is to give learners an overview of the practical skills and procedures needed to ensure consistent quality and safety of food and drink products.

This Unit will introduce learners to general aspects of production procedures as well as quality assurance procedures to ensure conformity of products and could be tailored to a specific food or drink manufacturer depending on the geographic location. Learners will gain hands-on experience performing experiments and researching methods and materials directly associated with the food and drink industry.

Preservation methods will also be investigated to give learners an understanding of how the shelf life of products can be extended and how this affects the sampling regime to ensure food safety and continuing product quality.

Waste management issues will also be investigated to give learners an overview of the methods employed by industry to reduce contamination and to recycle waste.

This Unit is suitable for learners who are S4 and above hoping to gain employment in the food and drink manufacturing industry. It is also suitable those who are employed with no/limited knowledge but wish to broaden their knowledge and skills in the food and drink manufacturing industry.

It aims to facilitate progression to further study including into National Progression Award in Food Manufacture (SCQF level 6) and then possibly onto Higher National and degree programmes in Food Science and Technology.

Learners who complete this Unit will be able to:

1 Understand the importance of accurate measuring, recording and the use of statistics in the food and drink manufacturing industry.
2 Analyse the preservation methods used by food and drink manufacturers to extend the shelf life of products.
3 Investigate procedures used to reduce waste and ensure recycling in the food and drink manufacturing industry.

Progression into the Unit

Entry to this Unit is at the discretion of the centre. However, learners would normally be expected to have attained the skills, knowledge and understanding required by one or more of the following or equivalent qualifications and/or experience:

- National 4 Health and Food Technology Course or relevant component Units
- National 4 Hospitality: Practical Cookery Course or relevant component Units
- National 4 Biology Course or relevant component Units

There may also be progression from National 4 Chemistry, National 4 Environmental Science, National 4 Physics or National 4 Science Courses.

In terms of prior learning and experience, relevant experiences and outcomes may also provide an appropriate basis for doing this Unit.

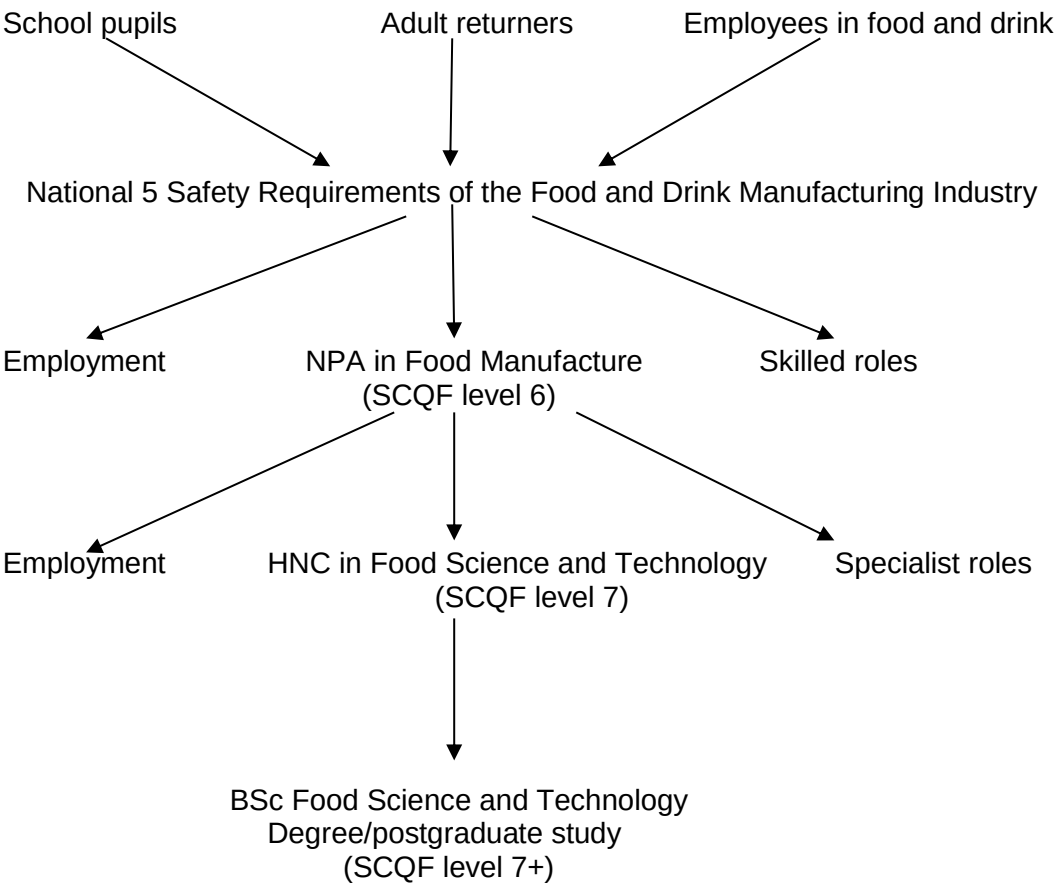
Skills, knowledge and understanding covered in this Unit

Information about skills, knowledge and understanding is given in the Skills for Work Food and Drink Manufacturing Industry *Course Support Notes*.

If this Unit is being delivered on a free-standing basis, teachers and lecturers are free to select the skills, knowledge, understanding and contexts which are the most appropriate for delivery in their centres as well as what is appropriate for the career opportunities of the learners in their area.

Progression from this Unit

Progression opportunities from this Unit onto further study at this or the next SCQF level could include:



Approaches to learning, teaching and assessment

Where possible, learning should occur through interaction with others, undertaking activities and through the building of a portfolio of outcomes and evaluations. Learners may benefit from:

- working in small research groups
- a basic knowledge of science-based subject (this is not essential)
- presenting their findings to the class, either individually or as a group
- class discussion of findings
- working individually to produce portfolios
- research activities to locate and analyse information online
- visits from those involved in the food and drink processing and manufacturing industry (eg manufacturing professionals, environmental health professionals or local processors)

It is recommended that evidence of practical skills demonstrated and tasks completed is gathered in individual laboratory notebooks. Evidence could also include poster presentations. These may include outputs from group work but the majority of the evidence should be produced by each individual learner.

If learners have varied food manufacturing interests, opportunities may exist for the areas of study to be tailored to meet individual areas of interest. Alternatively, learners could work on a single theme determined by the centre.

All activities should encourage the development of self-confidence and understanding of others. It is anticipated that discussion of learners' experiences and findings is carried out throughout the Unit and this used as a basis on which to build personal knowledge and experience, as well as to enable comparison with others regarding different food production/manufacturing areas.

Delivery of this Unit should be as practical as possible.

By adopting the learning and teaching approaches highlighted above and in the Outcomes and corresponding Evidence Requirements, this Unit will provide learners with the opportunity to develop the following essential skills for life, learning and work:

- time management, by meeting assignment deadlines and completion of tasks
- analytical and interpretative skills, by analysing data and collecting information
- presentation skills, by producing information to be shared with other learners
- independent learning, by producing individual reports and portfolios
- responsibility, by taking charge of their learning and producing the outcomes required
- confidence, by working and presenting information to classmates as well as meeting individuals from industry
- citizenship, by making links with industry

Where this Unit is taken as part of the Skills for Work: Food and Drink Manufacturing Industry Course, learners will be able to develop their skills and

knowledge further, thus increasing the opportunity for employment/promotion in the sector.

Some examples of learning and teaching activities are given in the following table:

Outcome	Approaches to learning and teaching	Approaches to assessment	Approaches to gathering evidence
Outcome 1 Understand the importance of accurate measuring, recording and the use of statistics in the food and drink manufacturing industry			
1.1 Accurately measuring weight, temperature and time and recording them in an appropriate form	Accurate measuring and recording is paramount to product safety and quality. Learners could be given the opportunity to investigate this in the laboratory by performing a range of experiments.	The range of experiments performed will vary greatly depending on the resources available and the industry that is being investigated. Due to this, an open-book flexible approach to assessment should be used.	A laboratory notebook could be kept, recording the experiments performed and results and conclusions evaluated. An oral account of the experiments, results and conclusions could also be used as evidence.
1.2 Analysing experimental data to determine the components present in a range of foods or drinks	Depending on resources available, evaluations could be made from results of chemical and/or physical testing carried out by the learner or from reference material.	The range of experiments that could be performed is very wide. Due to this, an open-book flexible approach to assessment should be used.	A laboratory notebook could be kept, recording the experiments performed and results and conclusions evaluated. An oral account of the experiments, results and conclusions could also be used as evidence.
1.3 Applying basic statistics to the formation of a sampling regime	Identifying the numbers of samples required to be taken to be statistically significant and cost of the process when formulating a sampling plan.	Learners could evaluate how production data is used to determine an effective sampling regime. An open-book, flexible approach should be used.	A notebook could be kept to record the calculations performed and the results and conclusions evaluated. An oral account of the experiments, results and conclusions could also be used as evidence.

Outcome	Approaches to learning and teaching	Approaches to assessment	Approaches to gathering evidence
Outcome 2 Analyse the preservation methods used by food and drink manufacturers to extend the shelf life of products			
2.1 Performing shelf life experiments	Depending on resources available, the learner could conduct experiments to compare the shelf life of foods or drinks which have been processed to extend shelf life.	Learners could record how the process affected the food or drink. An open-book, flexible approach to assessment should be employed.	A laboratory notebook could be kept to record the evaluations made by the learners. An oral account of the evaluations and conclusions could also be used as evidence.
2.2 Analysing the results of the experiments	Appropriate techniques could be used to determine any changes in the product.	Learners could evaluate the suitability of processes for extending shelf life and relate these to spoilage potential.	A laboratory notebook could be kept to record the observations. A poster presentation/oral presentation of the information could also be used as evidence.

Outcome	Approaches to learning and teaching	Approaches to assessment	Approaches to gathering evidence
Outcome 3 Investigate procedures used to reduce waste and ensure recycling in the food and drink manufacturing industry			
3.1 Investigating recycling procedures for waste products produced by the food and drink manufacturing industry	Many industries produce waste that can be recycled into useful products. For example, by-products from malt whisky distilleries can be used to generate both renewable energy and animal feed.	An open-book, flexible approach to assessment should be employed. This would allow the diversity of the industry and the various approaches to waste recycling to be investigated by learners.	A laboratory notebook could be kept to record the various research investigations carried out by the learners. A poster presentation/oral presentation of the information could also be used as evidence.
3.2 Determining the waste disposal/ treatment procedures employed by the food and drink manufacturing industry to reduce environmental contamination	Waste water treatment and sludge digestion are two methods commonly used in the food and drink industry to reduce the environmental impact of factory waste products. Learners could determine the treatments used by a specific industry to reduce contamination.	An open-book, flexible approach to assessment should be employed. Learners should be given access to materials, including the internet, to allow them to carry out the research required to complete this Assessment Standard.	A laboratory notebook could be kept to record the various research investigations carried out by the learners. A poster presentation/oral presentation of the information could also be used as evidence.

An exemplar checklist for use with this Unit is provided as an appendix: **Appendix 2: Exemplar Checklist**.

A laboratory notebook that combines Outcomes 1, 2 and 3 in a holistic approach would be beneficial to the delivery of this Unit. This combined approach to assessment would ensure that there will be a minimum of repetition allowing more time for learning.

Developing skills for learning, skills for life and skills for work

Learners are expected to develop broad generic skills as an integral part of their learning experience.

1 Literacy

1.3 Listening and talking

There would be an opportunity to develop listening and talking skills by ensuring learners work in groups and participate in transfer of information between individuals.

2 Numeracy

2.1 Number processes
2.2 Money, time and measurement

Learners will be introduced to weights and measures, nutritional analysis of foods and data analysis to ensure that a food or drink produced by industry is consistent and of a safe standard. This will include number processes and information handling as well as practical weighing and measuring exercises. Money and time will also be investigated when investigating sampling regimes and scale of production.

3 Health and wellbeing

3.1 Personal learning

Self-directed study, researching the importance of weights and measurements as well as preservation methods and how these allow the industry to produce food and drink that of a consistent quality and a safe standard will give learners the opportunity to broaden their personal learning and could give them the chance to make choices and changes in regard to their future job prospects.

4 Employability, enterprise and citizenship

4.1 Employability

The overall purpose of this Unit is to introduce learners to the practical skills and qualities required by the food and drink manufacturing industry in its employees. Completion of this Unit will give learners transferable skills for Employability.

5 Thinking skills

5.3 Applying
5.4 Analysing and evaluating

A knowledge and understanding of a specific food and drink manufacturer will be required to complete this Unit. Analysing and applying data in working production situations will also be investigated.

E-assessment

E-assessment can play an important role in the design and delivery of National Courses and Units by supporting integration and learner personalisation and choice. While it is important not to introduce new, additional ICT skills or knowledge, it may be that learners may be using ICT in working towards their assessment.

The following methods could be used to support learning, teaching and assessment.

- online testing to reinforce learning and for formative assessment
- web-based research
- e-portfolios to support personalisation and integration
- blogs to capture learners' reflections on their learning and to contribute to authenticating any Coursework they carry out in their own time

Equality and inclusion

It is recognised that centres have their own duties under equality and other legislation and policy initiatives. The guidance given in these *Unit Support Notes* is designed to sit alongside these duties but is specific to the delivery and assessment of the Unit.

Alternative approaches to Unit assessment to take account of the specific needs of learners can be used. However, the centre must be satisfied that the integrity of the assessment is maintained and where the alternative approach to assessment will, in fact, generate the necessary evidence of achievement.

Appendix 1: Reference documents

The following reference documents will provide useful information and background.

- Assessment Arrangements (for disabled candidates and/or those with additional support needs) — various publications on SQA's website: http://www.sqa.org.uk/sqa/14976.html
- *Building the Curriculum 4: Skills for learning, skills for life and skills for work*
- *Building the Curriculum 5: A framework for assessment*
- Course Specifications
- Design Principles for National Courses
- *Guide to Assessment* (June 2008)
- Overview of Qualification Reports
- *Overview of Qualification Reports*
- *Principles and practice papers for curriculum areas*
- *Research Report 4 — Less is More: Good Practice in Reducing Assessment Time*
- *Coursework Authenticity — a Guide for Teachers and Lecturers*
- *SCQF Handbook: User Guide (published 2009)* and SCQF level descriptors (to be reviewed during 2011 to 2012): www.sqa.org.uk/sqa/4595.html
- *SQA Skills Framework: Skills for Learning, Skills for Life and Skills for Work*
- *Skills for Learning, Skills for Life and Skills for Work: Using the Curriculum Tool*
- SQA Guidelines on e-assessment for Schools
- SQA Guidelines on Online Assessment for Further Education
- SQA e-assessment web page: www.sqa.org.uk/sqa/5606.html

Appendix 2: Exemplar Checklist

Learner's Name _____

Lecturer's Name _____

Date _____

Assessment Standard	Achieved (✓) Re-assessment (x)	Re-assessment Achieved (✓) Not Achieved (x)	Date
1.1 Accurately measuring weight, temperature and time and recording them in an appropriate form			
1.2 Analysing experimental data to determine the components present in a range of foods or drinks			
1.3 Applying basic statistics to the formation of a sampling regime			
2.1 Performing shelf life experiments			
2.2 Analysing the results of the experiments			
3.1 Investigating recycling procedures for waste products produced by the food and drink manufacturing industry			
3.2 Determining the waste disposal/treatment procedures employed by the food and drink industry to reduce environmental contamination			

Comments:_____

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Administrative information

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History of changes to Unit Support Notes

Unit details	Version	Description of change	Authorised by	Date