



## National Unit specification: general information

**Unit title:** Aeration (SCQF level 5)

**Unit code:** FT9X 11

**Superclass:** NE

**Publication date:** September 2011

**Source:** Scottish Qualifications Authority

**Version:** 02

### Summary

In this Unit candidates will apply aeration methods in a range of bakery products and processes. They will build up knowledge of the factors that affect aeration methods and how aeration is produced. This Unit can be integrated with others such as *Flour Confectionery Processes* or *Craft Baking*. This would provide examples of products made and baked using the aeration method.

This is a mandatory Unit in the National Certificate in Bakery at SCQF level 5 but is also available as a freestanding Unit. It is aimed at candidates who have little or no prior knowledge of basic science, and for those who require this knowledge for progression.

### Outcomes

- 1 Describe methods of aeration.
- 2 Apply single and combination methods of aeration in the production of bakery products.
- 3 Describe the appropriate storage and handling conditions required to maintain the quality of fresh, dried yeast, baking powders and aerators.

### Recommended entry

While entry is at the discretion of the centre, it would be beneficial if candidates had experience in craft baking or cooking to enable them to produce a suitable range of bakery goods.

## General information (cont)

**Unit title:** Aeration (SCQF level 5)

### Credit points and level

0.5 National Unit credits at SCQF level 5: (3 SCQF credit points at SCQF level 5\*)

*\*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.*

### Core Skills

Achievement of this Unit gives automatic certification of the following Core Skills component:

- ◆ Critical Thinking at SCQF level 5

There are also opportunities to develop aspects of Core Skills which are highlighted in the Support Notes of this Unit specification.

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

### **Unit title:** Aeration (SCQF level 5)

Acceptable performance in this Unit will be the satisfactory achievement of the standards set out in this part of the Unit specification. All sections of the statement of standards are mandatory and cannot be altered without reference to SQA.

#### **Outcome 1**

Describe methods of aeration.

#### **Performance Criteria**

- (a) Describe the four methods of aeration individually.
- (b) Describe combinations of the four methods of aeration.

#### **Outcome 2**

Apply single and combination methods of aeration in the production of bakery products.

#### **Performance Criteria**

- (a) Apply single methods of aeration appropriate to a variety of bakery products.
- (b) Apply combination methods of aeration appropriate to a variety of bakery products.
- (c) Comply with current Food Hygiene and Health and Safety procedures at all times.

#### **Outcome 3**

Describe the appropriate storage and handling conditions required to maintain the quality of fresh, dried yeast, baking powders and aerators.

#### **Performance Criteria**

- (a) Describe the storage and handling conditions to maintain the optimum quality of fresh yeast, dried yeast, baking powders and aerators.
- (b) Describe the effect of inappropriate storage and handling on fresh yeast, dried yeast, baking powders and aerators.

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

**Unit title:** Aeration (SCQF level 5)

### **Evidence Requirements for this Unit**

Evidence is required to demonstrate that candidates meet the requirements of all Outcomes and Performance Criteria.

#### **Outcome 1**

Evidence for Outcome 1 will include:

- ◆ Description of the following four methods of aeration: Chemical Aeration, Biological Aeration, Mechanical Aeration, Physical Aeration.
- ◆ Description of two practical examples of combination. Each example will detail a different practical way in which any two aeration methods can be combined, to include biological/physical and mechanical/ chemical.

#### **Outcome 2**

Evidence for Outcome 2 will include:

- ◆ Practical application of the four methods of aeration and of two practical combinations of these, suitable for production of bakery goods. Successful application of each of the four methods must be employed on two occasions.
- ◆ Recipes which detail the use of the correct aeration and/or combination of aeration methods, to produce suitable bakery goods and the reason for the choice of method related to the product.

Evidence produced must comply with current food hygiene and health and safety procedures at all times, and will be obtained under supervised conditions.

Describe the appropriate storage and handling conditions required to maintain the quality of fresh yeast, dried yeast, baking powders and aerators.

#### **Outcome 3**

Evidence for Outcome 3 will include:

- ◆ Description of the correct storage and handling conditions to maintain the optimum quality of fresh yeast, dried yeast, baking powder and ammonium bicarbonate.
- ◆ Description of the effect of inappropriate storage and handling on fresh yeast, dried yeast, baking powders and aerators.

Evidence for Outcome 3 must be obtained under closed-book supervised conditions.

## National Unit specification: support notes

### Unit title: Aeration (SCQF level 5)

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 20 hours.

### Guidance on the content and context for this Unit

This Unit is a mandatory Unit within the National Certificate in NC Bakery (SCQF level 5), but can also be taken as a free-standing Unit.

This Unit is knowledge based and aligns to the following Improve National Occupational Standards:

Craft Baking 109K, 113K, 202K.

In this Unit candidates are required to apply the four methods of aeration and the two practical combination methods, together with the knowledge of the factors that affect the aeration methods and how they are produced in a range of products and processes. The four methods of aeration are directly linked to the physics and chemistry of baking and a direct link to chemistry, biology and physics should be established to ensure there is some cognisance of the application in food preparation.

Food safety, hygiene regulations and safe working practices and procedures should be observed at all times.

Candidates would benefit from having Knowledge and/or Skills in baking or cooking and basic science.

This Unit could be integrated with:

- ♦ *Craft Baking*
- ♦ *Flour Confectionery Processes*

### Guidance on learning and teaching approaches for this Unit

In Outcome 1 candidates should learn about chemical aeration when two chemicals, eg bicarbonate of soda and a suitable acid ingredient are combined with heat and water to produce carbon dioxide gas which causes products to rise. They will also learn about the use of ammonium bicarbonate.

Candidates should also learn about biological aeration and how yeast containing living organisms produces carbon dioxide gas which causes product to rise.

Candidates should also learn about mechanical aeration, ie beating or whisking air into a product and physical lamination when fat or dough layers insulate the product and steam formed on heating the product pushes up layers. Another application of physical aeration is choux pastry.

## National Unit specification: support notes (cont)

### Unit title: Aeration (SCQF level 5)

Methods of aeration can be used in combination, eg biological and physical, mechanical and chemical.

In Outcome 2 candidates should learn about how to apply biological methods and the effect on fresh yeast of the amount used, the temperature, yeast food, and the level of salt. When applying chemical methods they should learn about the effects of which acid ingredient is used, the amount used, the ratio of acid ingredient to bicarbonate, the effect of temperature and the adverse effects of too much acid or bicarbonate of soda together with the preparation of self-raising flour and baking powder and the product range produced from it.

In mechanical aeration the use of whisks, beaters, mixing time and temperature should be employed to give optimum results and a suitable product range using produce for each of the whisk and the beater. The physical aeration should demonstrate the correct sheeting to ensure an understanding of adequate layering (lamination) the number of turns and temperature effects. This together with the gelatinisation of starch for choux paste products to ensure the generation and use of steam as an aerator. The product range should include the four methods of aeration and the two combination methods biological/physical and mechanical/ chemical.

For Outcome 2 candidates would benefit from:

- ♦ Working as a class to explore the minimum/maximum tolerances within the context of the various aeration techniques.
- ♦ Working in small groups to produce a variety of products from a particular method of aeration.
- ♦ A visit from an external bakery technologist.
- ♦ Visiting a yeast production factory.
- ♦ Working individually to improve a recipe within the context of a particular aeration method or combination of methods.

In Outcome 3 candidates should learn about storing and handling fresh yeast and dried yeast, particularly the effects of temperature, keeping yeast wrapped and the impact on its storage life. They will also learn about baking powder and the need to keep it dry and cool for maximum storage life. They should be aware of the product faults due to incorrect storage.

### Guidance on approaches to assessment for this Unit

The following approaches to assessment are suggested:

- Outcome 1: Restricted response questions could be used to describe the four principle methods of aeration and the two practical combinations of aeration.
- Outcome 2: Logbook. The candidate could have a comprehensive record of all the activities successfully carried out throughout the Unit to produce bakery products using all of the stated methods of aeration and combinations.
- Outcome 3: Restricted response questions could be used to describe the correct storage conditions and the effects of improper storage on the aerators and the problems this causes in the products made from them for all of the aerators stated in the Outcome.

## National Unit specification: support notes (cont)

### Unit title: Aeration (SCQF Level 5)

Accurate records should be made of assessment instruments used showing how evidence is generated for each Outcome and giving marking schemes and/or checklists. Records of candidate's achievements should be kept. These records will be available for external verification.

Time should be allowed for any necessary re-assessment.

### Opportunities for the use of e-assessment

E-assessment may be appropriate for some assessments in this Unit. By e-assessment we mean assessment which is supported by Information and Communication Technology (ICT), such as e-testing or the use of e-portfolios or e-checklists. Centres which wish to use e-assessment must ensure that the national standard is applied to all candidate evidence and that conditions of assessment as specified in the Evidence Requirements are met, regardless of the mode of gathering evidence. Further advice is available in *SQA Guidelines on Online Assessment for Further Education (AA1641, March 2003)*, *SQA Guidelines on e-assessment for Schools (BD2625, June 2005)*.

### Opportunities for developing Core Skills

In this Unit candidates will build up knowledge of the factors that affect aeration methods and understand how aeration is produced. They will then apply this knowledge practically to a range of bakery products and processes. They will also be able to describe how to handle and store aeration products safely to ensure they retain their quality.

Candidates will:

- ◆ Use different combinations of chemicals to see what effects they produce and explain their findings
- ◆ Explore how temperature and other factors affect chemical processes and explain their findings
- ◆ Calculate quantities of chemicals and ingredients and explain the reasons for this
- ◆ Create and adjust recipes using these calculations and explain the reasons for this.
- ◆ Work in groups to discuss properties of ingredients
- ◆ Work in groups to bake products.

As candidates are doing this Unit they will be developing aspects of the Core Skills in *Communication, Numeracy, Problem Solving* and *Working with Others*.

### 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)

## History of changes to Unit

Version	Description of change	Date
02	Core Skills Component Critical Thinking at SCQF level 5 embedded.	29/09/2011

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