National Unit Specification: general information

UNIT Aquaculture: An Introduction to Shellfish Production (SCQF level 4)

CODE F6TC 10

SUMMARY

In this Unit, candidates will gain a knowledge and understanding of the anatomy, life cycle and environmental requirements of a given shellfish species. The main production methods and equipment used to farm a given species will be investigated, with candidates also gaining an awareness of the main husbandry tasks undertaken on a shellfish farm.

OUTCOMES

1 Describe the biological characteristics and the life cycle of a given shellfish species.
2 Outline the main production methods and equipment used to farm a given shellfish species.
3 Describe the main husbandry tasks that are performed when farming a given shellfish species.

RECOMMENDED ENTRY

Entry is at the discretion of the centre.

CREDIT VALUE

1 credit at SCQF level 4 (6 SCQF credit points at SCQF level 4*).

**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.*

Administrative Information

Superclass: SJ

Publication date: May 2009

Source: Scottish Qualifications Authority

Version: 01

National Unit Specification: general information (cont)

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CORE SKILLS

Achievement of this Unit gives automatic certification of the following:

Complete Core Skill	None
Core Skill component	Critical Thinking at SCQF Level 3

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

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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 the biological characteristics and the life cycle of a given shellfish species.

Performance Criteria

(a) Identify correctly the main anatomical features of a given shellfish species.
(b) Describe accurately the function of the main anatomical features for a given shellfish species.
(c) State correctly the life cycle stages of a given shellfish species.
(d) Describe correctly the factors that influence the growth of a given shellfish species.

OUTCOME 2

Outline the main production methods and equipment used to farm a given shellfish species.

Performance Criteria

(a) Identify correctly a suitable site to farm a given shellfish species from a suite of given production sites.
(b) Identify correctly suitable production methods for a shellfish site from a suite of given production methods.
(c) Describe accurately different types of production equipment used to farm a given shellfish species.
(d) Describe accurately the advantages and disadvantages of different production equipment used to farm a given shellfish species.

OUTCOME 3

Describe the main husbandry tasks that are performed when farming a given shellfish species.

Performance Criteria

(a) Outline the methods used to stock, grade and harvest the shellfish.
(b) Describe the correct procedures for handling stock.
(c) Identify the tasks used to control fouling and predation.

National Unit Specification: statement of standards

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EVIDENCE REQUIREMENTS FOR THIS UNIT

Evidence is required to demonstrate that candidates have achieved all Outcomes and Performance Criteria.

Outcome 1 — Written and/or recorded oral evidence

The candidate must:

- identify the main anatomical features of a given shellfish species
- state the function of the main anatomical features indicating their involvement in feeding, protection, reproduction or gas exchange
- state the life cycle stages of a given shellfish species from gametes to adult, relating each stage to where it would normally be located in the wild
- describe a minimum of three factors that can influence the growth of a given shellfish species

Outcome 2 — Written and/or recorded oral evidence

The candidate must:

- state the main factors considered when choosing a suitable site for a shellfish farm
- identify the most suitable production site from a given suite of alternative sites for a shellfish farm
- identify a minimum of two main culture methods used to farm a given shellfish species, appropriate to a specific shellfish farm site
- match a minimum of three examples of production equipment with their relevant culture method for a given shellfish species
- describe one advantage and one disadvantage for one type of production equipment used to farm a given shellfish species

Outcome 3 — Written and/or recorded oral evidence

The candidate must:

- for a given shellfish species, outline two methods for each of the following:
  - — stocking
  - — grading
  - — harvesting
- describe how shellfish must be handled throughout the production cycle
- identify a minimum of two methods of controlling fouling on a shellfish farm
- identify a minimum of two methods of controlling predation on a shellfish farm

Centres must be satisfied that the evidence submitted is the work of individual candidates.

National Unit Specification: support notes

UNIT Aquaculture: An Introduction to Shellfish Production (SCQF level 4)

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 is an optional Unit within the National Progression Award in Aquaculture at SCQF level 4, but may also be taken as a free-standing Unit.

This Unit is aligned to the following Lantra, Sector Skills Council's National Occupational Standard (NOS) Units:

- Conduct shellfish depuration operations (Aqc 5)
- Collect wild shellfish spat (Aqc 6)
- Transport live fish (CU 56)

Outcome 1

The processes of modern shellfish cultivation have stemmed from a knowledge of the natural lifecycle and biological requirements for each species concerned. This Outcome will provide the candidate with knowledge of the anatomical features and their function, which would be achieved through theory based and practical activities.

Candidates would gain an understanding of the complete life cycle of a given species, analysing the various phases of development and how to identify these.

The environmental requirements needed to successfully farm a given species would be discussed, highlighting the conditions that are necessary for optimum growth. Candidates would explore how temperature, salinity and oxygen levels affect the growth of a particular stock and how these parameters are measured in the field where possible. The importance of microalgae as a food source would be outlined, with candidates undertaking plankton sampling, turbidity measurements and demonstrations of filter feeding.

Outcome 2

The candidate would be made aware of the importance of site selection with regard to water quality, depth, fetch, shelter, transport links, settlement trends, alternative users of the location, navigation restrictions, potential polluters, etc. The candidate will also be informed of how site characteristics can influence the production method adopted. After discussing the main characteristics of site selection, the candidate should be asked to apply this understanding to a fictitious or real shellfish farm on a diagram or map.

National Unit Specification: support notes (cont)

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The candidate will understand various culture methods available for farming a particular species and how juvenile stocks are obtained. The range of production equipment used to farm a specific species will be compared, with their advantages and disadvantages being discussed. The candidates could undertake site visits to local shellfish farms to gain an insight of the range of production methods and technology used.

GUIDANCE ON THE CONTENT AND CONTEXT FOR THIS UNIT

Outcome 3

For a given shellfish species, the main husbandry activities undertaken during the on-growing production cycle will be studied, with the candidates informed about the various types of equipment and methods that could be used to undertake these operations. These husbandry activities include the stocking, grading and harvesting of stock. Where possible, candidates could undertake visits to local shellfish farms to witness husbandry activities, or if possible, assist with operations.

Candidates will understand the differences between traditional processes (which are often labour intensive but cheap to undertake) and modern, mechanised processes (which are able to handle greater volumes but are costly to install and run).

Appropriate handling of shellfish stocks will be discussed so that the candidate will understand the importance of: minimising stress to the animals; maximising shelf life and minimising mortality.

Candidates will gain an understanding of the types of fouling organisms that can be problematic on a shellfish farm. Fouling organisms would include sea squirts, seaweeds, barnacles and tube worms. Measures to control such fouling will be discussed, highlighting the most appropriate times to undertake such activity. Where possible, candidates would be shown how shellfish can be affected by fouling on a local shellfish farm. The problems associated with predators (eider ducks, starfish, sea urchins, etc.) will be described, indicating the means available to farmers to control such problems.

GUIDANCE ON LEARNING AND TEACHING APPROACHES FOR THIS UNIT

It is envisaged that a range of teaching methods could be adopted to deliver this Unit, which would include classroom delivery, practical sessions, video illustrations and field trips to local shellfish farms where possible.

Dissections or dissection demonstrations are useful practical exercises and the candidates could be asked to produce labelled diagrams. These diagrams could be used as evidence for PC(a) of Outcome 1, but often students will find producing anatomical diagrams quite difficult. An alternative source of written and or oral evidence can be obtained from the candidate completing labelled organs on anatomical diagrams or photographs.

National Unit Specification: support notes (cont)

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OPPORTUNITIES FOR CORE SKILL DEVELOPMENT

In the Unit, candidates may have the opportunity to develop aspects of the Core Skill *Problem Solving* during Outcome 2. The Core Skills of *Communication* may also be developed during Outcome 2.

GUIDANCE ON APPROACHES TO ASSESSMENT FOR THIS UNIT

Outcome 1 could be assessed through a range of approaches, including:

- an identification exercise, requiring candidates to identify anatomical features and their functions
- a multiple choice exercise on the life cycle stages and factors affecting growth of a given species

Outcome 2 could be assessed through a range of approaches, including:

- an identification exercise, requiring candidates to identify appropriate sites and production methods
- a selection exercise, requiring candidates to identify production equipment with reference to its advantages and disadvantages

Outcome 3 could be assessed through a range of approaches, including:

- log book records of work undertaken
- site visit records
- a restricted response exercise

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).*

Time should be allowed for any necessary re-assessment.

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**