



National Unit specification: general information

Unit title: Aquaculture: Fish Health

Unit code: H039 11

Superclass: SJ

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Summary

The purpose of this Unit is to provide candidates with the knowledge and skills necessary to monitor fin fish health and identify the common causes of fish diseases. The procedures for fin fish disease control and prevention include reference to fin fish welfare and good husbandry practices. Candidates will carry out a range of disease treatment operations, that will require the calculation and application of treatments as well as maintaining accurate records, ensuring current legislation is being followed.

The Unit is suitable for candidates who are either new entrants or those already working in aquaculture. Candidates must have access to a fin fish farm to achieve the practical competences.

This is a mandatory Unit in the NPA in Fish Health and Nutrition (SCQF level 5). It is also available as a freestanding Unit.

Outcomes

- 1 Describe the common causes of fish disease in farmed fin fish.
- 2 Conduct fin fish health monitoring operations.
- 3 Describe the procedures for fin fish disease control.
- 4 Conduct fin fish disease treatment operations.

Recommended entry

Entry is at the discretion of the centre.

General information (cont)

Credit points and level

1 National Unit credit at SCQF level 5: (6 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 4

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: Aquaculture: Fish Health (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.

All activities must be carried out according to current legislation and Standard Operating Procedures (SOP).

Outcome 1

Describe the common causes of fin fish disease in farmed fish

Performance Criteria

- (a) Describe common non transmissible fin fish diseases and associated symptoms.
- (b) Describe common transmissible fin fish diseases including associated symptoms and mechanisms of disease transfer.
- (c) Describe methods of fish disease prevention including reference to Standard Operating Procedures (SOP) and site health plan.

Outcome 2

Conduct fin fish health monitoring operations.

Performance Criteria

- (a) Monitor and record fin fish behaviour including any abnormalities.
- (b) Monitor and record fin fish anatomy including any abnormalities.
- (c) Carry out recognised procedures for preparing laboratory samples for fin fish disease diagnosis.
- (d) Examine prepared samples and accurately record observations.

Outcome 3

Describe the procedures for fin fish disease control.

Performance Criteria

- (a) Describe fin fish disease prevention measures according to SOP and site health plan and in compliance with current legislation.
- (b) Describe fin fish disease treatment techniques conducted according to SOP and site health plan and in compliance with current legislation.
- (c) Identify equipment appropriate to disease treatment techniques and operator safety.
- (d) Outline the role of legislative authorities in the control of fin fish disease and current legislation.

National Unit specification: statement of standards (cont)

Unit title: Aquaculture: Fish Health (SCQF level 5)

Outcome 4

Conduct fin fish disease treatment operations

Performance Criteria

- (a) Calculate and measure the correct treatment dose appropriate to the fin fish disease being treated.
- (b) Prepare equipment and fin fish stocks for a disease treatment.
- (c) Carry out the application of the treatment dose according to SOP for the disease treatment technique.
- (d) Observe and record the immediate response of the fin fish stocks to the treatment.
- (e) Record the fin fish disease treatment accurately.

National Unit specification: statement of standards (cont)

Unit title: Aquaculture: Fish Health (SCQF level 5)

Evidence Requirements for this Unit

Written and/or oral recorded and performance evidence is required to demonstrate that candidates have achieved all Outcomes and Performance Criteria.

Candidates must have access to a fin fish farm to achieve the practical competences. All activities must be carried out in accordance with current legislation.

Outcome 1 — Written and/or recorded oral evidence is required that demonstrates that the candidate can:

- ◆ describe a minimum of two common non transmissible fin fish diseases and associated symptoms.
- ◆ describe a minimum of two common transmissible fin fish diseases and associated symptoms.
- ◆ describe two mechanisms of transfer for a fin fish transmissible disease.
- ◆ describe a minimum of two disease prevention measures including reference to sop and site health plan.

Evidence will be produced in closed book conditions.

Outcome 2 — Written and/or recorded oral evidence and performance evidence is required

The candidate must be able to perform the following tasks on a minimum of two separate occasions during routine fin fish disease observations:

- ◆ monitor fin fish behaviour and record any abnormalities.
- ◆ monitor fin fish external anatomy and record any abnormalities.
- ◆ dissect and observe fin fish internal anatomy and record any abnormalities.
- ◆ prepare a minimum of two samples from fin fish for disease diagnosis.
- ◆ examine prepared samples.
- ◆ maintain accurate records of observations.

Evidence will be produced in supervised open book conditions.

Outcome 3 — Written and/or recorded oral evidence is required that demonstrates that the candidate can:

- ◆ describe a minimum of two routine disease prevention measures according to SOP and site health plan and in compliance with current legislation.
- ◆ describe a minimum of two disease treatment techniques according to SOP and site health plan and in compliance with current legislation.
- ◆ identify two items of equipment required for fin fish disease treatments.
- ◆ identify two items of equipment essential for operator safety.
- ◆ identify a minimum of two roles of the legislative authorities in relation to fin fish disease control.
- ◆ identify two pieces of legislation that can be implemented for the control of fin fish disease.

Evidence will be produced in closed-book conditions.

National Unit specification: statement of standards (cont)

Unit title: Aquaculture: Fish Health (SCQF level 5)

Outcome 4 — Written and/or recorded oral evidence and performance evidence is required

The candidate must be able to perform the following tasks on a minimum of four separate occasions during routine fin fish disease treatment activities:

- ◆ Accurately calculate and measure the treatment dose appropriate to the fin fish disease being treated
- ◆ Prepare equipment appropriate to the treatment operation
- ◆ Prepare fin fish stocks for chemical treatments
- ◆ Apply treatment chemicals to fin fish stocks according to the SOP for the disease treatment technique
- ◆ Monitor and record a fin fish stock's reaction to a chemical treatment
- ◆ Record all disease treatment information in the fin fish health record book

Evidence will be produced in supervised open-book conditions.

National Unit specification: support notes

Unit title: Aquaculture: Fish Health (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 40 hours.

Guidance on the content and context for this Unit

This is a mandatory Unit in the NPA in Fish Health and Nutrition (SCQF level 5). It is also available as a free-standing Unit.

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

- ◆ Aqu 1 Prepare holding units to receive fish
- ◆ Aqu 2 Stock fish into holding units
- ◆ Aqu 3 Gather fish
- ◆ Aqu 4 Grade fish
- ◆ Aqu 6 Prepare to and feed fish
- ◆ Aqu 7 Collect information of fish growth and development
- ◆ Aqu 12 Monitor the aquatic production environment
- ◆ Aqu 13 Maintain environmental conditions within holding units
- ◆ Aqu 14 Treat health problems in fish
- ◆ Aqu 15 Spawn fish and fertilise fish eggs
- ◆ Aqu 17 Prepare to and maintain fish eggs in a hatchery
- ◆ Aqu 18 Care for juvenile fish
- ◆ Aqu 19 Prepare for the transport of live fish
- ◆ Aqu 20 Transport live fish
- ◆ Aqu 37 Work safely in an aquatic environment

This Unit could be delivered in the context of any farmed fin fish, although the disease treatment and fish health monitoring practices contained are most typical of a salmonid farm. Candidates should have access to a fin fish farm to achieve the practical competencies.

Outcome 1 — The importance of bio security as a measure to prevent or reduce the risk of disease should be emphasised to candidates during all fin fish husbandry or handling activities. The candidate should develop an understanding of the relationship between fish stress and disease, and the advantages of preventative measures as opposed to treatment. The causes of fin fish stress on a fin fish farm should be discussed with reference to methods of minimising stress during all routine fin fish handling operations.

The candidate should develop a basic understanding of the causes of common transmissible and non-transmissible disease. Candidates should be introduced to the basic biology of common pathogens including viruses, bacteria and an outline of the life cycles of common parasites.

National Unit specification: support notes (cont)

Unit title: Aquaculture: Fish Health (SCQF level 5)

Disease problems caused by poor water quality should be discussed with reference to available water treatment solutions, and an emphasis placed on the importance of maintaining high standards of husbandry and hygiene to ensure the risk of fin fish disease is minimised.

Outcome 2 — A basic knowledge of normal and abnormal fish behaviour, and external and internal anatomy is necessary for the candidate to be able to assess the anatomy and behaviour of fin fish. Candidates should receive instruction on the signs and symptoms that would indicate health issues and abnormal behaviour with fin fish stocks during routine monitoring and husbandry operations.

The candidate should be encouraged to observe farmed fin fish at every opportunity. This should include both healthy and diseased stock. Candidates should practise and develop their observation skills during all husbandry and handling activities, particularly when feeding, where the feed response can be used as a health indicator. This could be followed by observation of diseased fin fish behaviour for a variety of age classes of stock. The development of the candidate's fish stock awareness should be ongoing and should be a feature of all husbandry activities.

Candidates will prepare samples for routine examination and these could include skin scrapes, slide preparations for parasite examination, gill squashes, and the removal of internal organs for autopsy. Candidates should be taught basic microscopy with the emphasis on systematic searching of prepared slides. Routine disease identification skills could be restricted to a limited range of common parasites.

The importance of maintaining accurate and up to date health records to assist the development of the site health plan should be emphasised at all times.

Outcome 3 — Candidates should be made aware of the benefits of buying certified disease free stock, the disinfection of holding units and disinfection of incoming ova as part of a disease prevention policy that should be contained within the site health plan and SOP. The candidate should be introduced to vaccination practices including the automated inoculation techniques used by the salmon farming industry for preparing smolts for transfer.

Instruction should be given to candidates covering all methods of disease treatment commonly used on fin fish farms. This should include treatment of bacterial diseases and internal parasites, chemical application rates. The techniques for incorporating the chemical in the feed and ensuring ingestion by the fish should include reference to the requirement to comply with current legislation in relation to adding medicines to feed.

The procedures for the treatment of external parasites by the addition of chemicals to the water should include bath and flush treatment techniques. Operator health and safety should be discussed and the use of protective equipment required for the safe application of powdered and liquid chemicals included.

The importance of monitoring the reaction of fin fish stocks to the treatment and how to recognise and respond to excessive fin fish stress by employing emergency procedures such as increased aeration and flushing should be emphasised.

National Unit specification: support notes (cont)

Unit title: Aquaculture: Fish Health (SCQF level 5)

Candidates should be made aware of the requirements to comply with current legislation and industry codes of practice in relation to disease treatments, fin fish movements, reporting of notifiable diseases, health and safety and discharge consents.

The legal requirements for accurate health and treatment records to be maintained and the importance of those records to the site health plan should be emphasised.

Outcome 4 — Candidates should be made aware of current legislation and the health and safety requirements to consider when using any chemical treatments. The importance of using appropriate Personal Protective Equipment (PPE) in compliance with the SOPs and site health plan should be emphasised.

Candidates must be made aware of the procedures for the disposal of out of date chemicals and any waste treatments, and the need to comply with current legislation.

The candidate should practise dose calculations for a range of disease treatments including bath and flush methods and the addition of chemicals to fin fish feed to develop accuracy and reliability.

Demonstrations should be given on the preparation of the fin fish stock for treatment, including stock conditioning, holding unit preparation and the prevention of cross contamination of other stocks. Candidates should be encouraged to practice these preparations as routine before any treatments take place.

National Unit specification: support notes (cont)

Unit title: Aquaculture: Fish Health (SCQF level 5)

Treatments should be applied according to the site health plan and SOPs, in compliance with current legislation and safety regulations for the disease treatment technique. Candidates should monitor the reaction of fin fish stocks to the treatment and receive instruction on how to recognise and respond to excessive fish stress and maintain fin fish welfare by employing emergency procedures.

Candidates should be made aware of the requirement for post treatment monitoring and accurate health records to be maintained in line with current legislation.

Guidance on learning and teaching approaches for this Unit

This Unit lends itself to a range of teaching and learning approaches that give consideration to the Curriculum for Excellence capacities and Equalities legislation, through reasonable adjustment for all candidates. Some formal teaching will be required to introduce disease recognition and symptoms, disease prevention methods, mechanisms of disease transfer and current disease control legislation

There is scope for candidate centred learning based on workbooks, web based resources and interactive ICT based learning objects presented within a virtual learning environment (VLE).

Interactive exercises and regular formative assessment, incorporating online multiple-choice is recommended, in order to develop the candidates understanding of routine health monitoring and treatment of disease.

The candidate should be given the opportunity to become familiar with basic calculations in relation to disease treatments, degree days and withdrawal periods, before becoming involved in those activities as part of the routine farm procedures.

The main delivery of this Unit should be based on a commercial scale fin fish farm. Practical tasks should be demonstrated before candidates are encouraged to become involved with routine health monitoring. This should be combined with candidates initially observing routine disease treatment activities being conducted before they can carry out any treatments. This will allow candidates to develop their skills and experience over an extended period.

It would be advantageous to have learning packages for a range of species. Although a lot of fin fish species will share the same basic concepts in relation to routine health monitoring and disease treatments, there are major differences with some species (marine environment, cage units) in scale, size of fish, chemicals and equipment and techniques required to carry out those operations while ensuring fin fish welfare is a priority.

National Unit specification: support notes (cont)

Unit title: Aquaculture: Fish Health (SCQF level 5)

Guidance on approaches to assessment for this Unit

Outcome 1 and 3 could be assessed using restricted response questioning or oral examination. Assessment could also be gathered using online assessments in a VLE, or through candidate portfolios.

Outcomes 2 and 4 require the observation of practical activity with the results recorded on checklists to satisfy the Performance Criteria. Additional knowledge evidence is required to satisfy the requirements of these outcomes. This can be provided orally or written. Where the evidence is given orally, it is recommended that there should also be written evidence in the form of laboratory or farm records or a diary. Candidates could maintain their own ongoing log of routine health monitoring and disease treatment activities, containing the associated records and calculations. This could be stored in a candidate portfolio, either paper based or e-portfolio.

In addition for Outcome 2 the assessment could be carried out using portfolio evidence and performance checklist. In the event of no abnormalities being present the candidates should be questioned orally.

Centres must be satisfied that the evidence submitted is the work of individual candidates. Assessor observation checklists and other assessment records should be maintained and kept up to date to keep track of candidate progress and to provide evidence for internal and external verification purposes.

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 social software. 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)*.

National Unit specification: support notes (cont)

Unit title: Aquaculture: Fish Health (SCQF level 5)

Opportunities for developing Core Skills

In this Unit candidates will develop skills in prevention, control and treatment of fin fish diseases.

Candidates will:

- ◆ describe the causes of fish stress on a fin fish farm and methods of minimising stress during all routine fin fish handling operations.
- ◆ describe the causes of common transmissible and non-transmissible disease and disease problems caused by poor water quality
- ◆ describe signs and symptoms that indicate health issues and abnormal behaviour with fin fish stocks during routine monitoring and husbandry operations.
- ◆ prepare fin fish stock for treatment, including stock conditioning, holding unit preparation and the prevention of cross contamination of other stocks.
- ◆ prepare samples for routine examination, including skin scrapes, slide preparations for parasite examination, gill squashes, and the removal of internal organs for autopsy.
- ◆ calculate, measure and administer correct treatment doses for a range of disease treatments according to standard operating practice.
- ◆ monitor the reaction of fin fish stocks to the treatment and recognise and respond to excessive fin fish stress by employing emergency procedures
- ◆ maintain accurate and up to date health records

This means that as candidates are doing this Unit they will be developing aspects of the Core Skills of *Communication*, *Problem Solving* and *Numeracy*.

This Unit has the Problem Solving component of Critical Thinking embedded in it. This means that when candidates achieve the Unit, their Core Skills profile will also be updated to show they have achieved Critical Thinking at SCQF level 4.

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

History of changes to Unit

Version	Description of change	Date
02	Core Skills Component Critical Thinking at SCQF level 4 embedded.	06/01/12

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