



## Higher National Unit specification

### General information for centres

**Unit title:** Fish Health and Disease

**Unit code:** F4S5 34

**Unit purpose:** This Unit is designed to enable candidates to gain knowledge and understanding of fish health and disease problems and their management. It is also designed to develop the skills required to identify, diagnose and treat a range of common fish diseases.

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

- 1 Describe fish diseases.
- 2 Explain the control and management of fish diseases.
- 3 Conduct fish disease diagnoses.
- 4 Conduct and manage fish disease treatments.

**Credit points and level:** 1 HN credit at SCQF level 7: (8 SCQF credit points at SCQF level 7\*)

*\*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 is at the discretion of the centre; however, it would be beneficial if candidates have achieved Biology at SCQF level 6 and are currently undertaking the HN Unit *Fish Science: Freshwater Fish*.

**Core Skills:** There are opportunities to develop the Core Skill component Using Number (*Numeracy*) at SCQF level 5 in this Unit, although there is no automatic certification of Core Skills or Core Skills components.

**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:** It is recommended that Outcomes 1 and 2 are assessed by extended response questions.

Outcomes 3 and 4 could be assessed during practical sessions carried out at a fish farm laboratory.

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

**Unit title:** Fish Health and Disease

**Unit code:** F4S5 34

The sections of the Unit stating the Outcomes, Knowledge and/or Skills, and Evidence Requirements are mandatory.

Where evidence for Outcomes is assessed on a sample basis, the whole of the content listed in the Knowledge and/or Skills section must be taught and available for assessment. Candidates should not know in advance the items on which they will be assessed and different items should be sampled on each assessment occasion.

### **Outcome 1**

Describe fish diseases

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

- ◆ Non-infectious diseases of fish: nutritional; genetic; environmental
- ◆ External infectious diseases of fish: viral; bacterial; fungal; parasitic
- ◆ Internal infectious diseases of fish: viral; bacterial; fungal; parasitic

#### **Evidence Requirements**

Evidence for this Outcome will be generated through sampling as detailed below.

Where evidence for Outcomes is assessed on a sample basis, the whole of the content listed in the Knowledge and/or Skills must be taught and available for assessment. Candidates should not know in advance the items on which they will be assessed and different items should be sampled on each assessment occasion to prevent the candidates being able to predict what they will be asked. In all three Evidence Requirements listed below, each of the two diseases must be selected from a different category.

Candidates will need to provide evidence to demonstrate their Knowledge and/or Skills by showing that they can:

- ◆ describe the causes and diagnostic symptoms of two non-infectious disease of fish
- ◆ describe the causes and diagnostic symptoms of two external infectious diseases of fish
- ◆ describe the causes and diagnostic symptoms of two internal infectious disease of fish

All of the above must be carried out under closed-book conditions.

#### **Assessment Guidelines**

This Outcome could be assessed by extended response questions.

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

**Unit title:** Fish Health and Disease

### Outcome 2

Explain the control and management of fish diseases

#### Knowledge and/or Skills

- ◆ Disease prevention measures: husbandry measures; hygiene; vaccination; bio-security; probiotics; immuno-stimulants
- ◆ Disease treatment methods: dip; flush; bath; medicated feed; injection; COSHH/HASAW Regulations
- ◆ Numerical calculations of Unit holding volumes, dose rates and treatment chemical quantities
- ◆ Current fish disease control legislation
- ◆ Administrative and statutory bodies

#### Evidence Requirements

Evidence for this Outcome will be generated through sampling as detailed below.

Where evidence for Outcomes is assessed on a sample basis, the whole of the content listed in the Knowledge and/or Skills must be taught and available for assessment. Candidates should not know in advance the items on which they will be assessed and different items should be sampled on each assessment occasion to prevent the candidates being able to predict what they will be asked.

Candidates will need to provide evidence to demonstrate their Knowledge and/or Skills by showing that they can:

- ◆ explain the theory and practice of two disease prevention measures, each from separate categories
- ◆ explain the theory and practice of two disease treatment methods, each from separate categories, including reference to COSHH/HASAW Regulations
- ◆ calculate Unit holding volumes for one rectangular Unit and one circular Unit
- ◆ calculate one treatment chemical quantity required for each of two disease treatment methods
- ◆ calculate chemical quantities and feed quantities for one medicated feed treatment
- ◆ explain two aspects of current fish disease control legislation including reference to administrative and statutory bodies

The evidence for this Outcome must be produced in supervised conditions whereby candidates should be allowed access to a calculator and up to four sides of A4 notes relating to disease treatment options and a standard fish feed table relevant to the assessment questions.

#### Assessment Guidelines

This Outcome could be assessed using extended response questions.

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

**Unit title:** Fish Health and Disease

### Outcome 3

Conduct fish disease diagnoses

#### Knowledge and/or Skills

- ◆ Fish behaviour: swimming; feeding; response to disturbance
- ◆ Collection and transport of fish samples
- ◆ External manifestations of disease in fish: skin; fins; gills; eyes; body shape
- ◆ Internal manifestations of disease in fish: kidney; liver; heart; stomach; intestine; spleen; swim bladder
- ◆ Sampling and preparing organs for disease examination and diagnosis: skin scrape; fin; gill; eye; blood; intestine; kidney; liver
- ◆ Disease records maintenance
- ◆ Materials and equipment for fish disease examination and diagnosis

#### Evidence Requirements

Evidence for this Outcome will be generated through sampling as detailed below.

Where evidence for Outcomes is assessed on a sample basis, the whole of the content listed in the Knowledge and/or Skills must be taught and available for assessment. Candidates should not know in advance the items on which they will be assessed and different items should be sampled on each assessment occasion to prevent the candidates being able to predict what they will be asked.

Candidates will need to provide evidence to demonstrate their Knowledge and/or Skills by showing that they can:

- ◆ diagnose and record details of two types of abnormal fish behaviour
- ◆ collect and transport fish samples on two occasions
- ◆ diagnose and record details of the external manifestations of disease on two occasions
- ◆ diagnose and record details of the internal manifestations of disease on two occasions
- ◆ sample and prepare four organs for disease examination and diagnosis on two occasions
- ◆ maintain records of examination and diagnosis on two occasions
- ◆ maintain, store and dispose of materials and equipment from all sampling, examination and diagnosis work

All of the above should be carried out under supervised conditions using performance evidence supported by the candidate's records of disease examination and diagnosis.

#### Assessment Guidelines

This Outcome could be assessed during practical sessions carried out at a fish farm laboratory.

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

**Unit title:** Fish Health and Disease

### Outcome 4

Conduct and manage fish disease treatments

#### Knowledge and/or Skills

- ◆ Health and safety for fish disease treatment
- ◆ Disease treatment regimes: dip; bath; flush; medicated feed; injection
- ◆ Fish stock and holding Unit preparation for treatment
- ◆ Disease treatment chemicals
- ◆ Application of treatment chemicals
- ◆ Post-treatment observation
- ◆ Fish treatment records

#### Evidence Requirements

Evidence for this Outcome will be generated through sampling as detailed below.

Where evidence for Outcomes is assessed on a sample basis, the whole of the content listed in the Knowledge and/or Skills must be taught and available for assessment. Candidates should not know in advance the items on which they will be assessed and different items should be sampled on each assessment occasion to prevent the candidates being able to predict what they will be asked.

Candidates will need to provide evidence to demonstrate their Knowledge and/or Skills by showing that they can:

- ◆ prepare fish stock and fish holding units for two different disease treatment regimes
- ◆ prepare one dry and one liquid treatment chemical for application adhering to COSHH/HASAW Regulations
- ◆ apply dry and liquid treatment chemicals on two occasions using two different disease treatment regimes
- ◆ observe and record over a 10 day period, the reactions of fish to two different disease treatment regimes
- ◆ observe all current health and safety regulations throughout
- ◆ maintain records of fish treatments and post-treatment observations for two disease treatment regimes

All of the above should be carried out under supervised conditions using performance evidence supported by the candidate's records of disease fish disease treatments and post-treatment observations.

#### Assessment Guidelines

This Outcome could be assessed during practical sessions carried out at a fish farm laboratory.

## Administrative Information

**Unit code:** F4S5 34  
**Unit title:** Fish Health and Disease  
**Superclass category:** RH  
**Original date of publication:** August 2008  
**Version:** 01

### History of changes:

Version	Description of change	Date

**Source:** SQA

© Scottish Qualifications Authority 2008

This publication may be reproduced in whole or in part for educational purposes provided that no profit is derived from reproduction and that, if reproduced in part, the source is acknowledged.

SQA acknowledges the valuable contribution that Scotland's colleges have made to the development of Higher National qualifications.

Additional copies of this Unit specification can be purchased from the Scottish Qualifications Authority. Please contact the Customer Contact Centre for further details, telephone 0845 279 1000.

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

### **Unit title: Fish Health and Disease**

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 intended for candidates who are working in or seeking a career in the aquaculture, fisheries management or aquatics industries.

The teaching and learning of this Unit should be delivered in this context.

Health and safety procedures should always be followed especially in the practical components of this Unit where individuals are working with disease organisms and treatment chemicals.

Additional information relating to each Outcome is given below:

- 1 This Outcome provides an introduction to the broad range of non-infectious and infectious diseases that are encountered in both wild and farmed fish and is relevant to both freshwater and marine situations. It is not intended to provide full and detailed information relating to the vast number of fish diseases that exist but delivery should cover examples from all the major groups (nutritional, genetic, environmental, viral, bacterial, fungal and parasitic) with particular reference to those that are of current interest to the relevant industries. Delivery should cover the broad characteristics of the main groups and provide more detailed information on a few examples in each, ideally those that might be encountered during practical observation or diagnoses. The species of fish covered should ideally be relevant to the candidate's field of interest. The Outcome also provides information on the range of symptoms that can be caused by the disease groups covered and it is essential that emphasis is placed on the importance of observation and early recognition of symptoms of disease.
- 2 This Outcome covers the range of factors that influence disease conditions and the options that exist for their prevention, control, management and treatment. The importance of disease prevention and control should be emphasised with particular reference to good husbandry practices and the importance of good hygiene and bio-security practices. The full range of disease treatment options should be covered and the need for accurate calculations of water volumes, treatment chemical quantities, fish weights and feed rations emphasised. The health and safety recommendations associated with disease treatments should be stressed including the implications of COSHH and HASAW legislation.

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

### Unit title: Fish Health and Disease

- 3 This Outcome is designed to provide the candidate with the skills to carry out initial diagnoses of basic fish health problems. Observation and understanding of fish behaviour in aquaculture, aquatics or wild fishery situations is critical to early recognition of problems and should be emphasised in delivery. Care should be taken to ensure fish are killed and transported appropriately and that detailed records of sampling are maintained. Wherever possible, more detailed laboratory diagnoses should be carried out on fish observed and sampled by the student. Observation skills should be developed over a series of practicals where an analytical approach to diagnosis should be encouraged. In most situations more detailed laboratory examination of fish should be restricted to the investigation of a range of fungal and external and internal parasites. Investigation of potential viral and bacterial conditions should be restricted to tissue sampling exercises. Laboratory information should be related to farm or field observations and notes thereby developing the student's skills in evaluating all available information when making health management and/or treatment decisions.
- 4 This Outcome is designed to provide the candidate with the skills to carry out disease treatment operations appropriately and safely under veterinary guidance where appropriate. The importance of accurate treatment calculations and timings must be stressed. Emphasis should be placed on the importance of consistently following correct procedures for the administration of treatments with particular emphasis on ensuring minimum stress to fish and the safety of personnel. Wherever possible, treatments should be carried out on fish stocks sampled by the candidate.

Note that the assessment of all Outcomes of this Unit involves sampling. It must be emphasised that all Knowledge and/or Skills must be taught regardless of the sample used for assessment on any particular occasion.

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

This Unit is likely to be part of a Group Award designed to provide candidates with the ability to work in the aquaculture, fisheries management and aquatics industries. It could also be a stand alone Unit for those with a particular interest in fish health and welfare.

Where the Unit forms part of the Group Award it should be delivered after the Units *Fish Science: Freshwater Fish* and *Water Resources for Aquaculture and Fisheries* as they contain underpinning knowledge and practical competences relevant to this Unit.

There is a practical component to this Unit with candidates being required to observe fish behaviour, collect fish samples and carry out detailed sampling in laboratory conditions to ensure they have the necessary skills to carry out basic routine fish disease diagnoses.

There is also a requirement for candidate to carry out practical disease treatment operations and monitor the response of fish to treatments.

There are two written assessments and two practical assessments including the requirement for candidates to submit records of their fish disease diagnoses and fish treatment regimes.

The assessment for Outcome 1 will be closed-book and could consist of extended response questions.



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

### **Unit title:** Fish Health and Disease

The assessment for Outcome 2 will be undertaken in supervised conditions and could consist of extended response questions.

Outcomes 3 and 4 will be assessed by performance evidence collected in supervised conditions together with candidates' records of disease diagnoses and treatments.

Note that assessment for all Outcomes involves sampling. It is emphasised again that all Knowledge and/or Skills must be taught even though it is not all assessed on any particular occasion.

### ***Opportunities for developing Core Skills***

This Unit provides the opportunity to develop the component Core Skill of Using Number in relation to the calculation of unit volumes, chemical quantities, dose rates, fish weights and feeding rates.

### **Open learning**

If this Unit is delivered by open or distance learning methods, additional resources will be required for candidate support, assessment and quality assurance.

### **Candidates with disabilities and/or additional support needs**

The additional support needs of individual candidates should be taken into account when planning learning experiences, selecting assessment instruments, or considering alternative Outcomes for Units. Further advice can be found in the SQA document *Guidance on Assessment Arrangements for Candidates with Disabilities and/or Additional Support Needs* ([www.sqa.org.uk](http://www.sqa.org.uk)).

## **General information for candidates**

### **Unit title:** Fish Health and Disease

This Unit is intended to prepare you for work in the aquaculture, aquatics and fisheries management industries but is equally valuable if you have a particular interest in fish health and disease.

When you undertake the Unit you will study the main broad groups of diseases in fish, covering both non-infectious and infectious causes. The information in this area will be relevant to a wide range of species in both marine and freshwater systems whether wild or captive and will enable you to identify the main groups of disease causing organisms and recognise the general symptoms they might cause.

You will also study the options that exist for the control and management of fish diseases including prevention measures, controlling legislation and the methods and chemicals commonly used to treat some of the diseases. This will provide you with the background knowledge and numerical skills to effectively recommend and carry out basic disease treatments.

Using the knowledge you have gained from the theoretical parts of the Unit on diseases and their management, you will then have the opportunity to learn the observational and laboratory practical skills required to carry out basic fish disease diagnoses. This will involve taking and analysing samples from fish with a view to assessing their disease status.

You will also have the opportunity to gain the practical skills associated with the effective and safe treatment of disease using a range of methods.

This Unit will also afford you the opportunity to develop the Core Skill component of Using Numbers at SCQF level 5.

To achieve this Unit you will have to gain a satisfactory level of performance in the theory (Outcomes 1 and 2) and practical (Outcomes 3 and 4) assessments. The assessment for Outcome 1 will be undertaken in closed-book conditions and the assessment for Outcome 2 will be undertaken in supervised conditions. The assessments for Outcomes 3 and 4 will be undertaken during normal practical activities for this Unit.