

# A Review of Vocational Education and Training Aquatic Animal Health Programs Within Australia

---



*Developed By Mark Oliver for the AAHS Aquatic Animal Health Subprogram of  
The Fisheries Research Development Corporation*



**FRDC**  
FISHERIES RESEARCH &  
DEVELOPMENT CORPORATION

## Table of Contents

List of Abbreviated Terms .....	3
Key Findings .....	4
Background .....	5
Objectives .....	5
The Vocational Training Landscape of the Australian Aquaculture and Fisheries Sectors.....	6
Institutions Delivering Aquaculture Training from SFITP.....	6
Practical Application of the SFITP by Australian RTOs .....	8
AAH and the SFITP.....	8
Current Trends and Practices in AAH Training in the Vocational Training Sector. ....	11
Articulation Procedures for Aquaculture Based Vocational Education Qualifications and the Tertiary Sector .....	14
Identified Shortfalls in AAH Training for the Vocational Training and Education Sector .....	14
Conclusions.....	14
Appendix 1.....	16
Quality Principles of Training Packages as Outlined by the National Skills Standards Council .....	16
Appendix 2.....	18
A Typical Certificate III in Aquaculture Offered by Vocational Training Institutions in Australia.	18
Appendix 3.....	19
AAH unit from the Certificate III in Aquaculture .....	19

## List of Abbreviated Terms

AAH - Aquatic Animal Health

AAHS - Aquatic Animal Health Subprogram

FRDC - Fisheries Research Development Corporation

SFITP - Seafood Industry Training Package

## Key Findings

The vocational training and education sector have an existing curriculum known as the Seafood Industry Training Package (SFITP)

Aquatic animal health is trained in all of the 5 level of qualifications offered in the SFITP

Training methodologies are designed from the SFITP

Practical application in training is a vital part of the vocational training framework

Although most areas of AAH are well serviced, the areas of biosecurity and aquatic animal welfare need to be enhanced within the SFITP and subsequent training delivery

Learning materials for the vocational sector need to be upgraded to meet current industry trends.

Vocational institutions are ready to work with other areas the tertiary sector to enhance AAH training and education.

## Background

The FRDC Aquatic Animal Health Subprogram (AAHS) has identified the development of a national aquatic animal health curriculum in tertiary institutions as a high priority for the Australian aquatic animal sector. While the AAHS has a reasonable understanding of what aquatic animal health courses are available at Australian universities and veterinary schools, it is recognised that there is a lack of awareness of such courses available through vocational training institutes such as TAFEs. As a result the PI was engaged to undertake a strategic review of the vocational training environment within the context of Aquatic Animal Health (AAH) training, assessment and curriculum.

## Objectives

The objectives of the review were to:

- develop a comprehensive catalogue of vocational institutes providing courses in aquatic animal health;
- outline past and present vocational training courses that address aquatic animal health;
- define training package aquatic animal health content, elements, performance criteria, critical knowledge areas, critical skills areas, range statements, critical aspects of evidence and assessment for all vocational levels;
- outline specific topics/species covered in the learning materials of vocational training institutions; and
- define articulation procedures for vocational training areas of aquatic animal health into tertiary systems.

## The Vocational Training Landscape of the Australian Aquaculture and Fisheries Sectors

*Like most skills based vocations in Australia, aquaculture and fisheries have a suite of existing frameworks which underpin skills development and enhancement for the industry.*

The central pillar of this framework is a training package. Training packages underpin the vocational training and education area of the Australian Qualifications Framework. Simply put, a training package can be defined as: “A set of nationally endorsed standards and qualifications for recognising and assessing people’s skills in a specific industry, industry sector or enterprise.” For the purposes of this report it will be acknowledged in broad terms as the existing curriculum of the vocational training and education sector. Training packages also provide a framework for the delivery of training. The nationally recognised set of quality principles of training packages are outlined in Appendix 1.

Training Packages are developed by or in close consultation with industry and are managed by an Industry Skills Council. In the case of fisheries and aquaculture it is managed by AgriFood Skills Australia and the document is known as the Seafood Industry Training Package (SFITP). The 5614 page document covers all major sectors of the seafood industry including aquaculture, seafood sales and distribution, fishing operations and seafood processing. Table 1.1 outlines the qualifications within the SFITP. Aquaculture qualifications are highlighted.

The aquaculture qualifications are tiered in structure with the Certificate I being entry level moving through to a Certificate III recognised as the technician/farm hand level, while the Diploma sits within the realm of management. A typical Certificate III in Aquaculture would consist of the units outlined in Appendix 2, although the package is highly flexible with a multitude of elective options.

### Institutions Delivering Aquaculture Training from SFITP

There are approximately 12 institutions delivering accredited aquaculture training from the SFITP throughout Australia (Table 1.2) These institutions, known as Registered Training Organisations (RTOs) comprise of both TAFEs and Private training institutions. The high school sector also undertakes some aquaculture training from the SFITP in various regions throughout Australia, however they operate an auspicing arrangement by utilising an RTOs registration through the national regulator. There are RTOs delivering aquaculture training from the SFITP in every state of Australia, excluding the ACT. They deliver training in a variety of methods such as on campus, distance learning, on line, in workplaces or a blend of these.

<b>Qualification Code</b>	<b>Title</b>
<b><u>SFI10111</u></b>	<b><u>Certificate I in Aquaculture</u></b>
SFI10211	Certificate I in Fishing Operations
SFI10511	Certificate I in Seafood Processing
<b><u>SFI20111</u></b>	<b><u>Certificate II in Aquaculture</u></b>
SFI20211	Certificate II in Fishing Operations
SFI20411	Certificate II in Fisheries Compliance Support
SFI20511	Certificate II in Seafood Processing
SFI20611	Certificate II in Seafood Industry (Sales and Distribution)
<b><u>SFI30111</u></b>	<b><u>Certificate III in Aquaculture</u></b>
SFI30211	Certificate III in Fishing Operations
SFI30311	Certificate III in Seafood Industry (Environmental Management Support)
SFI30411	Certificate III in Fisheries Compliance
SFI30511	Certificate III in Seafood Processing
SFI30611	Certificate III in Seafood Industry (Sales and Distribution)
<b><u>SFI40111</u></b>	<b><u>Certificate IV in Aquaculture</u></b>
SFI40211	Certificate IV in Fishing Operations
SFI40311	Certificate IV in Seafood Industry (Environmental Management)
SFI40411	Certificate IV in Fisheries Compliance
SFI40511	Certificate IV in Seafood Processing
SFI40611	Certificate IV in Seafood Industry (Sales and Distribution)
<b><u>SFI50111</u></b>	<b><u>Diploma of Aquaculture</u></b>
SFI50211	Diploma of Fishing Operations
SFI50411	Diploma of Fisheries Compliance
SFI50511	Diploma of Seafood Processing

Table 1.1 Qualifications in the SFITP – Aquaculture qualifications are bold and underlined

<b>RTO Name</b>	<b>State or Territory</b>
Challenger Institute of Technology	WA
Charles Darwin University	NT
Department of Training and Workforce Development	WA
Durack Institute of Technology	WA
Great Southern Institute of Technology	WA
Kimberley Training Institute	WA
LMC Training	QLD
Northern Melbourne Institute of TAFE	VIC
Seafood Training Tasmania	TAS
TAFE NSW - North Coast Institute	NSW
TAFE NSW - Hunter Institute	NSW
TAFE SA	SA

Table 1.2 RTOs currently delivering vocational aquaculture training throughout Australia

## **Practical Application of the SFITP by Australian RTOs**

The central pillar of a qualification from the SFITP is the unit of competency. Simply called units, they do not set out how one should teach the particular subject matter. The central role of the unit is to unequivocally define the skills and knowledge required in undertaking specific tasks. These standards can then be applied as an assessment tool to gauge whether the individual is competent or not. Having this knowledge, it is used in retrospect to design learning experience and assessment materials which meet these defined sets of skills.

Units of competency are the frameworks of aquaculture programs in vocation training sector. A suite of these units are pre-determined to deliver a qualification. As an example, a Certificate III in Aquaculture is comprised of 18 units. Each unit has a mirrored framework which ensures consistency from a quality assurance perspective. A full example of a single Certificate III level aquatic animal health (AAH) unit is found in Appendix 3.

## **AAH and the SFITP**

Units related to AAH are spread throughout the aquaculture training area of the SFITP. The units either fully address AAH in a more traditional definition including disease identification, treatment and control, where as other units deal with factors which contribute to AAH performance such as water quality and nutrition. Table 2.2 outlines units of competency which address AAH at all Certificate and Diploma Levels.



Aquaculture Certificate Level					
Unit Names	Certificate I	Certificate II	Certificate III	Certificate IV	Diploma
	SFICORE105B Work effectively in the seafood industry	SFICORE105B Work effectively in the seafood industry	SFICORE105B Work effectively in the seafood industry	SFICORE105B Work effectively in the seafood industry	SFICORE105B Work effectively in the seafood industry
	FDFOP1009A Follow work procedures to maintain quality	SFICORE105B Work effectively in the seafood industry	SFIAQUA308C Maintain water quality and environmental monitoring	SFIAQUA308C Maintain water quality and environmental monitoring	SFIAQUA501C Develop a stock nutrition program
		SFIAQUA205C Feed stock	SFIAQUA317A Oversee the control of diseases	SFIAQUA316A Oversee the control of predators and pests	SFIAQUA505C Plan stock health management
		SFIAQUA206C Handle stock	SFIAQUA316A Oversee the control of predators and pests	SFIAQUA317A Oversee the control of diseases	SFIAQUA507C Plan and design water supply and disposal systems
		SFIAQUA209C Manipulate stock culture environment	SFIAQUA303C Coordinate stock handling activities	SFIAQUA404C Operate hatchery	SFIAQUA502C Develop and implement an aquaculture breeding strategy
		SFIAQUA213C Monitor stock and environmental condition	SFIAQUA313B Oversee operations of high technology water treatment components	SFIAQUA409B Implement, monitor and review stock production	
		SFIAQUA222A Control diseases	SFIAQUA314A Support hatchery operations	SFIAQUA410B Implement a program to operate, maintain or upgrade a system comprising high technology water treatment components	

Aquaculture Certificate Level					
		SFIAQUA221A Control predators and pests		SFIAQUA411A Manage water quality and environmental monitoring in enclosed systems	
		SFISTOR204A Prepare, pack and dispatch stock for live transport		BSBRSK401A Identify risk and apply risk management processes	

Table 2.2 Units of competency which address AAH at all Certificate and Diploma Levels in the SFITP

## **Current Trends and Practices in AAH Training in the Vocational Training Sector.**

Almost without exception all vocational training institutes have aquaculture facilities which are used for practical skills experience. Some of these facilities operate in a semi commercial environment. For RTOs that do not, they focus upon on site commercial workplace training and utilise the facilities at each venue. A questionnaire was sent to RTOs which sought to identify current practices in AAH training in the Vocational Training Sector. Table 3.1 outlines the major AAH skills based areas taught by the vocational sector. What was overwhelmingly apparent is that institutions had a holistic approach to managing their aquaculture system and how opportunities for training experiences were available on a daily basis.

Having students manage the aquaculture system which in turn gave them ownership of the livestock allowed for a more holistic approach to the training. Students were responsible for water quality monitoring, general husbandry, feeding, maintenance and eventually harvest. It went further than individual gazetted learning experiences as there was a longer term commitment. An example of this would be water quality. A student would not be taught how to undertake a water quality test alone, they would have to repeatedly show competence in calibrating the machine, taking readings, interpreting them, entering the data, making decisions around the data and undertaking the right course of action to compliment the data reading. This is how the SFITP would define competence.

Table 2.2 shows the major skills and knowledge areas of AAH that are addressed during the Certificate II, III and Diploma of Aquaculture.

Table 2.2 major skills and knowledge areas of AAH that are addressed during the Certificate II, III and Diploma of Aquaculture

Qualification (name and or national code)	Major skills delivered	Training methods	Main species used by vocational training institutions
<b>SFI20111 Cert II Aquaculture</b>	Microscopy skills WHS using and dispensing chemicals Stock behaviour Basic water quality Stock handling	Prac on basic microscopy Treating ponds and tanks using chemicals Carrying out measuring, mixing, dosing, testing with powders and liquids Workshop sessions on stock behaviours Dissection of fish, prawns and crayfish Handling, sampling and harvesting fish	Silver Perch Australian Bass Freshwater Crayfish Marine Prawns Barramundi Trout Salmon Clown Fish
<b>SFI30111 Cert III Aquaculture</b>	Microscopy – gill snips and skin/slime scrapes Treatment choices and calculations Water quality monitoring Feeding and basic nutrition Health assessments of broodstock, larvae and grow out stock	Grading and sorting Visual health assessments of live fish and tiger prawns Handling, sampling and harvesting fish and prawns Practical session working through calculations related to animal health, with theory attached Accessing information around APVMA, WHS, reading SDS, chemical usage in aquaculture	Freshwater ornamentals

<b>SFI5011 Diploma in Aquaculture</b>	Developing on site health management plans Biosecurity protocols Stock nutrition planning Selective breeding management Production planning	Workshop on best management practice biosecurity techniques Practical developing health management plans for a commercial aquaculture enterprise Developing and implementing standard operating procedures for on farm disease monitoring, treatment, biosecurity protocols and off site diagnosis	
---	---	--	--

## **Articulation Procedures for Aquaculture Based Vocational Education Qualifications and the Tertiary Sector**

There is currently no formal structure for articulation into an undergraduate degree from a vocational aquaculture qualification. This is not to say that it is impossible as each submission for credit is on a case by case basis lodged within the academic institution. Aquaculture qualifications within the SFITP are tiered starting from Certificate I through to Diploma. When passing this level there are semi defined pathways for undergraduates to advance their aquaculture knowledge and skills through the tertiary sector. The schism occurs between the completion of the Vocational Training sector and the undergraduate level.

## **Identified Shortfalls in AAH Training for the Vocational Training and Education Sector**

It was universally acknowledged by all RTOs that the existing curriculum (SFITP) is a quality document that forms the foundations of structured, industry informed training. There was however specific areas within the package that pertain to AAH that need more focus. The areas of biosecurity and animal welfare were identified as shortfalls in the SFITP. Another major area of AAH training that needed focus was not the SFITP itself, but the learning materials developed by the institutions. Many feel these materials are not current and time and money should be allocated to upgrade these learning materials to ensure currency in their training procedures.

## **Conclusions**

The vocational training and education sector have an existing curriculum known as the Seafood Industry Training Package (SFITP)

Aquatic animal health is trained in all of the 5 level of qualifications offered in the SFITP

Training methodologies are designed from the SFITP

Practical application in training is a vital part of the vocational training framework

Although most areas of AAH are well serviced, the areas of biosecurity and aquatic animal welfare need to be enhanced within the SFITP and subsequent training delivery

Learning materials for the vocational sector need to be upgraded to meet current industry trends.

Vocational institutions are ready to work with other areas the tertiary sector to enhance AAH training and education.

## Appendix 1

### Quality Principles of Training Packages as Outlined by the National Skills Standards Council

Quality principles	Key features <b>The endorsed components of a Training Package must</b>	Evidence <b>How do the endorsed components of a Training Package achieve this?</b>
Ensures responsiveness to the needs of contemporary industry and its workforce	1. Reflect contemporary work organisation and job profiles incorporating a futures orientation	<ul style="list-style-type: none"> <li>• Open and inclusive consultation and validation commensurate with scope and impact is conducted</li> <li>• Other national and international standards for skills are considered</li> </ul>
	2. Be driven by industry's needs	<ul style="list-style-type: none"> <li>• Clever, sustainable approaches to incorporate feedback from stakeholders</li> </ul>
	3. Respond to government broad policy initiatives	<ul style="list-style-type: none"> <li>• Innovative responses to government policy initiatives</li> </ul>
Enables recognition of an individual's competence across industries and occupations	4. Recognise convergence and connectivity of skills	<ul style="list-style-type: none"> <li>• Incorporation of cross industry units and qualifications</li> </ul>
	5. Support movement of skills within and across organisations and sectors	<ul style="list-style-type: none"> <li>• Clear and consistent packaging rules for qualifications</li> <li>• Qualification framework and pathways are effectively designed</li> <li>• Incorporates skill sets</li> </ul>
	6. Promote national and international portability	<ul style="list-style-type: none"> <li>• Qualification outcomes are aligned with the Australian Qualifications Framework</li> <li>• Other national and international standards for skills are considered</li> </ul>
	7. Reflect licensing and regulatory requirements	<ul style="list-style-type: none"> <li>• Solutions to incorporate licensing and regulatory requirements are brokered</li> </ul>
Provides flexibility to meet individual enterprise and learner needs	8. Meet the diversity of individual and enterprise needs	<ul style="list-style-type: none"> <li>• Clear and consistent packaging rules for qualifications</li> <li>• Provide flexible qualifications that enable application in different contexts</li> </ul>
	9. Support equitable access and progression of learners	<ul style="list-style-type: none"> <li>• Provide multiple entry and exit points</li> <li>• Pre and co-requisite units of competency are minimised</li> <li>• Units of competency are clearly</li> </ul>



Quality principles	Key features The endorsed components of a Training Package must	Evidence How do the endorsed components of a Training Package achieve this?
		written and have consistent breadth and depth
	10. Support learner transition between education sectors	<ul style="list-style-type: none"> <li>• Advice is provided on implementation/pathways</li> </ul>
<b>Ensures ...</b>  <b>FUNCTIONALITY</b>  <b>... through ease of understanding, clever design and adherence to policy and publication requirements</b>	11. Support implementation across a range of settings	<ul style="list-style-type: none"> <li>• Advice is provided on implementation/pathways</li> </ul>
	12. Support sound assessment practice	<ul style="list-style-type: none"> <li>• Units of competency are clearly written and have consistent breadth and depth</li> </ul>
	13. Not impose structural barriers to implementation	<ul style="list-style-type: none"> <li>• Clear and consistent packaging rules for qualifications</li> <li>• Compliance with the National Training Information System (NTIS)/National Register standard for loading and publication</li> <li>• Compliance with Training Package policy</li> </ul>

## Appendix 2

### A Typical Certificate III in Aquaculture Offered by Vocational Training Institutions in Australia.

<b>SFICORE101C</b>	<b>Apply basic food handling and safety practices</b>
<b>SFICORE103C</b>	Communicate in the seafood industry
<b>SFICORE105B</b>	Work effectively in the seafood industry
<b>SFICORE106B</b>	Meet workplace OHS requirements
<b>SFIAQUA308C</b>	Maintain water quality and environmental monitoring
<b>SFIAQUA317A</b>	Oversee the control of diseases
<b>SFIAQUA316A</b>	Oversee the control of predators and pests
<b>SFIAQUA303C</b>	Coordinate stock handling activities
<b>SFIAQUA318A</b>	Coordinate feed activities
<b>SFIAQUA302C</b>	Construct or install stock culture, holding and farm structures Infrastructure and Machinery
<b>SFIAQUA217B</b>	Maintain stock culture, holding and other farm structures
<b>AHCMOM305A</b>	Operate specialised machinery and equipment
<b>SFIAQUA313B</b>	Oversee operations of high technology water treatment components
<b>SFIAQUA314A</b>	Support hatchery operations
<b>BSBINM301A</b>	Organise workplace information
<b>SFIAQUA309C</b>	Oversee harvest and post-harvest activities Harvesting
<b>AHCWRK305A</b>	Coordinate work site activities
<b>SFIFISH209C</b>	Maintain the temperature of seafood

## Appendix 3

### AAH unit from the Certificate III in Aquaculture

#### SFIAQUA317A **Oversee the control of diseases**

#### Unit Descriptor

<b>Unit descriptor</b>	<p>This unit of competency involves overseeing the prevention of diseases in cultured and held stock, including ornamentals, and selecting the appropriate control measures should an outbreak occur.</p> <p>Licensing, legislative, regulatory or certification requirements may apply to this unit. Therefore it will be necessary to check with the relevant state or territory regulators for current licensing, legislative or regulatory requirements before undertaking this unit.</p>
------------------------	---

#### Application of the Unit

<b>Application of the unit</b>	<p>The unit has application to <i>cultured or held stock</i> in an aquaculture or holding facility in the seafood industry, or to an aquascape, display or holding tank in the ornamental or pet sector. The unit applies to those workers who have responsibility for a specific area of work or who lead a work group or team. Skills to coordinate staff are covered by RTE3704A Coordinate worksite activities.</p> <p><b>Licences may be required for the use of chemicals, medications and treatments.</b></p> <p>All enterprise or workplace procedures and activities are carried out according to <i>relevant government regulations, licensing and other compliance requirements, including occupational health and safety (OHS) guidelines, food safety and hygiene regulations and procedures, and ecologically sustainable development (ESD) principles.</i></p> <p>Equipment operation, maintenance, repairs and calibrations are undertaken in a safe manner that conforms to manufacturer instructions. Appropriate <i>personal protective equipment (PPE)</i> is selected, checked, used and maintained.</p>
--------------------------------	---

## Licensing/Regulatory Information

Refer to Unit Descriptor

### Pre-Requisites

<b>Prerequisite units</b>		

### Employability Skills Information

<b>Employability skills</b>	This unit contains employability skills.
-----------------------------	--

### Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.	Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.
---	--

## Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
1. Diagnose <i>disease</i> outbreaks	1.1. Hazard identification, assessment and risk control procedures for the workplace are implemented and monitored. 1.2. Appropriate PPE is provided, used and maintained. 1.3. Staff assisting with disease control are organised and briefed on work requirements. 1.4. Stock are monitored for a range of health problems. 1.5. Where appropriate, sick stock are <i>diagnosed</i> and checked against specialist advice where doubt exists. 1.6. Professional advice is obtained where the complexity of or the severity of outbreak dictates. 1.7. Disease outbreaks are investigated and stock deaths reported. 1.8. Observations are made which support a systematic and comprehensive analysis of available symptoms. 1.9. Samples are collected for laboratory diagnosis, where necessary, according to laboratory specifications. 1.10. Conclusions drawn from relevant information are based on appropriate evidence and reasoned decisions.
2. Select <i>prevention and control methods</i> for diseases	2.1. Disease control methods appropriate to environmental conditions and severity of outbreak are selected. 2.2. Preventative methods are selected and implemented to contain the identified outbreak.
3. Treat ill health in stock	3.1. Feedback from external analysis of samples is understood. 3.2. Action is taken or treatment given according to veterinary guidelines, including obtaining appropriate approval for use of restricted medication. 3.3. Withholding periods of medications are complied with as required. 3.4. Infestations/infections are monitored and progress compared with manufacturer specifications and enterprise industry records. 3.5. Treatment programs are modified, where necessary, and records maintained. 3.6. Senior personnel are notified promptly of significant changes to treatments.
4. Monitor and review post-disease treatment or control activities and operations	4.1. Clean up of work area, including repairs and storage of equipment, is supervised and condition report prepared. 4.2. Relevant disease treatment or control data, observations or information are recorded legibly and accurately, and any out of range or unusual records are checked. 4.3. Compliance and other required reports are prepared

ELEMENT	PERFORMANCE CRITERIA
	<p>and conveyed to senior personnel advising of the effectiveness of disease treatment or control, and recommendations made for improvements.</p> <p>4.4. Staff are given feedback on their work performance.</p>

## Required Skills and Knowledge

<b>REQUIRED SKILLS AND KNOWLEDGE</b>
This section describes the skills and knowledge required for this unit.
<b>Required skills</b>
<p>applying treatments to diseases            assessing signs of stress in stock            communicating information about disease control activities to staff            communicating significant changes to treatments to senior personnel            coordinating staff carrying out disease control activities            diagnosing disease infestations or outbreaks            identifying potential improvements            providing feedback to staff on performance            reviewing disease control programs            reviewing risk disease problems            selecting control measures for the treatment of diseases.</p> <p><b>Literacy skills used for:</b>            filling out regulatory forms            labelling samples            interpreting stock health plans, labels and laboratory reports            recording information on enterprise data sheets            writing reports for management.</p> <p><b>Numeracy skills used for:</b>            analysing the cost-effectiveness of medication/chemical usage            estimating infestation severity            calculating dose rates for medication/chemicals            weights and volumes.</p>
<b>Required knowledge</b>
<p>alternate combinations of treatment methodologies            characteristics, signs and symptoms of disease infestations of cultured or held stock            chemical and non-chemical control measures            common types and causes of environmental diseases            ESD principles            importance of good water quality and correct nutrition            life cycles and physiology of disease organisms            local, regional and state or territory-based priorities for the use of chemicals in the control of infestations or outbreaks            location/availability of expert assistance            normal/abnormal stock behaviour            notifiable diseases and associated regulatory requirements</p>

**REQUIRED SKILLS AND KNOWLEDGE**

relevant OHS, food safety and ESD requirements relating to overseeing the control of diseases  
treatment and control methodologies, stock behaviour characteristics and withholding periods of various common treatment programs.

## Evidence Guide

<b>EVIDENCE GUIDE</b>	
The evidence guide provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge, range statement and the Assessment Guidelines for the Training Package.	
<b>Overview of assessment</b>	
<b>Critical aspects for assessment evidence required to demonstrate competence in this unit</b>	<p>Assessment must confirm the ability to:</p> <ul style="list-style-type: none"> <li>organise staff assisting with disease control</li> <li>select control methods in line with enterprise guidelines to protect or prevent stock being harmed by diseases</li> <li>respond to outbreaks of diseases in such a way as to minimise loss or harm to stock.</li> </ul> <p>Assessment must confirm knowledge of:</p> <ul style="list-style-type: none"> <li>characteristics, signs and symptoms of disease outbreaks of cultured or held stock</li> <li>life cycles and physiology of disease organisms</li> <li>types of environmental diseases</li> <li>methods for prevention and control of outbreaks of diseases.</li> </ul>
<b>Context of and specific resources for assessment</b>	<p>Assessment is to be conducted at the workplace or in a simulated work environment and should reflect the range of controls and preventative measures used on diseases typically threatening cultured or held stock in the local area.</p> <p>Resources may include:</p> <ul style="list-style-type: none"> <li>culture or holding structures and stock</li> <li>equipment for controlling diseases</li> <li>medications, chemicals or products used in the treatment of diseases</li> <li>microscopes and dissecting instruments</li> <li>research reference material</li> <li>staff to supervise.</li> </ul>
<b>Method of assessment</b>	The following assessment methods are suggested: <ul style="list-style-type: none"> <li>case study analysis</li> <li>project (work or scenario based)</li> <li>research assignment</li> <li>written or oral short-answer testing.</li> </ul>
<b>Guidance information for assessment</b>	This unit may be assessed holistically with other units within a qualification.



## Range Statement

<b>RANGE STATEMENT</b>	
<p>The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.</p>	
<p><b><i>Cultured or held stock</i></b> may include:</p>	<p>adults, broodstock (ready to breed), seedstock or stockers, eggs and sperm, fertilised eggs, larvae, post-larvae, seed, spat, hatchlings, yearlings, juveniles, fry, fingerlings, yearlings, smolt, sporophytes, seedlings and tissue cultures</p> <p>finfish, crustaceans, molluscs, aquatic reptiles, amphibians, polychaete and oligochaete worms, plankton, micro-algae, seaweed, aquatic plants, live rock, sponges and other aquatic invertebrates</p> <p>for human consumption (seafood), stockers for other farms, stockers for conservation or recreational fishing, display or companion animals (ornamentals), and other products, including pearls, skins, shells, eggs, chemicals and pigments</p> <p>wild caught, hatchery or nursery reared.</p>
<p><b><i>Relevant government regulations, licensing and other compliance requirements</i></b> may include:</p>	<p>biodiversity and genetically modified organisms</p> <p>biosecurity, translocation and quarantine</p> <p>Australian Quarantine Inspection Service (AQIS) and other import requirements</p> <p>business or workplace operations, policies and practices</p> <p>ESD principles, environmental hazard identification, risk assessment and control</p> <p>fisheries or aquaculture regulations, permits and licences</p> <p>health and welfare of aquatic animals</p> <p>Indigenous land rights and cultural activities, including fishing by traditional methods</p> <p>OHS hazard identification, risk assessment and control.</p>
<p><b><i>OHS standards</i></b> may include:</p>	<p>appropriate workplace provision of first aid kits and fire extinguishers</p> <p>codes of practice, regulations and/or guidance notes which may apply in a jurisdiction or industry sector</p> <p>enterprise-specific OHS procedures, policies or standards</p> <p>hazard and risk assessment of workplace,</p>

<b>RANGE STATEMENT</b>	
	<p>maintenance activities and control measures  induction or training of staff, contractors and visitors in relevant OHS procedures and/or requirements to allow them to carry out their duties in a safe manner</p> <p>OHS training register  safe lifting, carrying and handling techniques, including manual handling, and the handling and storage of hazardous substances  safe systems and procedures for outdoor work, including protection from solar radiation, fall protection, confined space entry and the protection of people in the workplace  systems and procedures for the safe maintenance of property, machinery and equipment, including hydraulics and exposed moving parts  the appropriate use, maintenance and storage of PPE.</p>
<p><i>Food safety and hygiene regulations and procedures</i> may include:</p>	<p>Australian Shellfish Sanitation program  equipment design, use, cleaning and maintenance  exporting requirements, including Australian Quarantine Inspection Service (AQIS) Export Control (Fish) orders  handling and disposal of condemned or recalled seafood products  Hazard Analysis Critical Control Point (HACCP), food safety program, and other risk minimisation and quality assurance systems  location, construction and servicing of seafood premises  people, product and place hygiene and sanitation requirements  Primary Products Standard and the Australian Seafood Standard (voluntary)  processing, further processing and preparation of food, including seafood and aquatic products  product labelling, tracing and recall  receipt, storage and transportation of food, including seafood and aquatic products  requirements set out in Australian and New Zealand Food Authority (ANZFA) Food Standards Code and state and territory food regulations  temperature and contamination control along chain of custody.</p>
<p><i>ESD principles</i> may include:</p>	<p>applying animal welfare ethics and procedures  control of effluents, chemical residues, contaminants, wastes and pollution  control of weeds, pests, predators and diseases,</p>

<b>RANGE STATEMENT</b>	
	<p>and stock health maintenance  improving energy efficiency  increasing use of renewable, recyclable and recoverable resources  minimising noise, dust, light or odour emissions  preventing live cultured or held organisms from escaping into environment  reducing emissions of greenhouse gases  reducing energy use  reducing interactions with native and protected flora and fauna, marine or land parks or areas  reducing use of non-renewable resources  undertaking environmental hazard identification, risk assessment and control  undertaking facility quarantine, biosecurity and translocation of livestock and genetic material  using and recycling water, and maintaining water quality</p>
<i>PPE</i> may include:	<p>buoyancy vest or personal floatation device (PFD)  gloves, mitts or gauntlets, and protective hand and arm covering  hard hat or protective head covering  hearing protection (e.g. ear plugs and ear muffs)  non-slip and waterproof boots (gumboots) or other safety footwear  personal locator beacon or Emergency Position Indicating Radio Beacon (EPIRB)  protective eyewear, glasses and face mask  protective outdoor clothing for tropical conditions  respirator or face mask  safety harness  sun protection (e.g. sun hat, sunscreen and sunglasses)  uniforms or overalls  waterproof clothing (e.g. wet weather gear and waders).</p>
<i>Diseases</i> may include:	<p>causes of impairment of health or a condition resulting in abnormal functioning of the cultured or held stock  environmental causes, such as poor water quality or contaminants (chemicals)  nutritional (e.g. feed contaminants, quality and quantity)  viruses, protozoans, bacteria, fungi, worms, parasites and toxins of biological origin (e.g. toxic algae).</p>
<i>Diagnosed</i> may include:	<p>dissection of stock  microscope, binocular or stage  visual inspection.</p>

**RANGE STATEMENT**

<i>Prevention and control methods</i> may include:	appropriate nutritional program, additional vitamins biological control (e.g. cleaner fish) chemical barriers (e.g. foot baths) deprivation or purging disinfection of equipment filtration, ozonation or water treatment freshwater, saltwater or chemical baths medication in food probiotics and other chemicals (e.g. pesticides, herbicides and algacides) prophylactic treatments of probiotics reducing stress (e.g. providing cover, hides, shelters and habitat) replacing susceptible species/variety with resistant species/variety vaccination or inoculation: medicated feeds syringes, drippers and other application equipment water quality optimisation.
--	--

**Unit Sector(s)**

<b>Unit sector</b>	Aquaculture operations
--------------------	------------------------

**Co-requisite units**

<b>Co-requisite units</b>	

**Competency field**

<b>Competency field</b>	
-------------------------	--