



Australian Government

Department of Education, Employment and Workplace Relations

SFIAQUA311B Oversee production and maintain algal or live-feed cultures

Release: 1

SFIAQUA311B Oversee production and maintain algal or live-feed cultures

Modification History

Not Applicable

Unit Descriptor

Unit descriptor	This unit of competency involves producing algal or live-feed cultures to be fed to <i>cultured or held stock</i>. The unit includes planning for production, initiating and growing cultures and organising their harvest. In some facilities only one of the culture types is produced, in others both may be produced. Skills to coordinate staff are covered by RTE3704A Coordinate worksite activities. No licensing, legislative, regulatory or certification requirements apply to this unit at the time of publication.
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Application of the Unit

Application of the unit	All enterprise or workplace procedures and activities are carried out according to <i>relevant government regulations, licensing and other compliance requirements</i>, including <i>occupational health and safety (OHS) guidelines</i> and <i>ecologically sustainable development (ESD) principles</i>. 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.
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Licensing/Regulatory Information

Refer to Unit Descriptor

Pre-Requisites

Prerequisite units	

Prerequisite units		

Employability Skills Information

Employability skills	This unit contains employability skills.
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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.
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Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
1. Plan for production	1.1. Production schedule is interpreted and confirmed with senior personnel. 1.2. Labour and resource requirements for production are confirmed. 1.3. Risk factors that could affect the quality of algal or live-feed cultures during production are identified and plans made to minimise risk. 1.4. Efficient culture systems are assembled and commissioned for use. 1.5. Operational guidelines to achieve desired production objectives are planned and communicated effectively to staff.
2. Prepare for initiation and maintenance of algal or live-feed cultures	2.1. Production vessels or structures and other equipment are checked for serviceability. 2.2. Culture water is treated to meet the physio-chemical requirements of the cultured organism. 2.3. Inoculation cultures to meet the required stocking density are readied for use. 2.4. Nutrient formulae or media are prepared.
3. Monitor and maintain culture production	3.1. Physio-chemical requirements of the culture organism are measured and maintained for the culture period. 3.2. Sterile conditions and equipment are maintained in parent and stock cultures. 3.3. Culture health is checked regularly by sampling the culture water and appropriate action taken to achieve the production schedule.
4. Harvest culture	4.1. Harvesting equipment is collected and checked for serviceability. 4.2. Sub-standard equipment is repaired or replaced. 4.3. Required quantity of culture is collected in harvest equipment. 4.4. Production vessel is refilled with preconditioned water and nutrients are added to return the culture to pre-harvest conditions. 4.5. Unused cultures and wastes are treated and disposed of.
5. Complete culture production activities	5.1. Clean up of work area, including repairs and storage of equipment, is supervised and condition report prepared. 5.2. Relevant culture production data, observations or information are recorded legibly and accurately, and

ELEMENT	PERFORMANCE CRITERIA
	any out of range or unusual records checked. 5.3. Compliance and other required reports are prepared and conveyed to senior personnel advising of the effectiveness of culture production, and recommendations made for improvements. 5.4. Options for improving efficiency through mechanisation or automation of process or activity, and use of specialised contract staff are researched and presented to senior personnel as potential improvements. 5.5. Staff are given feedback on their work performance.

Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE

This section describes the skills and knowledge required for this unit.

Required skills

- altering the physio-chemical environment and nutriment formulae or media to meet the culture species requirements throughout the culture period
- communicating with senior personnel on production schedule, labour and resource requirements
- communicating operational guidelines to staff
- coordinating algal or live-feed production and staff
- identifying potential improvements
- providing feedback to staff on performance
- reporting orally and in writing on production of algae or live-feeds to senior personnel
- recognising signs of health or ill health in species and mitigation methods
- researching options for improvement.

Literacy skills used for:

- interpreting the production schedule
- recording information relating to algal or live-feed production and harvest
- researching mechanisation or automation options
- writing reports for senior personnel on the algal or live-feed production process.

Numeracy skills used for:

- calculating inoculation culture to achieve desired stocking density

REQUIRED SKILLS AND KNOWLEDGE

- calculating the culture period for the species
- calculating volumes
- completing production records.

Required knowledge

- inoculation culture required to achieve stocking density
- nutriment formulae or media requirements for species during culture period
- operation process for effective production of algal or live-feed cultures, including setting up, initiating and breeding, monitoring health and growth, harvesting and cleaning up
- options for mechanisation or automation of process or activity
- physio-chemical requirements for the culture species
- services provided by specialised contract services.

Evidence Guide

EVIDENCE GUIDE

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.

Overview of assessment

Critical aspects for assessment evidence required to demonstrate competence in this unit

Assessment must confirm the ability to:

- monitor all aspects of the production process
- prepare nutriment formulae or media
- coordinate staff to achieve the efficient and successful production of algal or live-feed cultures
- treat culture water.

Assessment must confirm knowledge of:

- operation process for effective production of algal or live-feed cultures, including setting up, initiating and breeding, monitoring health and growth, harvesting and cleaning up.

Context of and specific resources for assessment

Assessment is to be conducted at the workplace or in a simulated work environment. The inoculation cultures used should reflect those typically grown by aquaculture enterprises in the region.

Resources may include:

- inoculum culture
- monitoring equipment
- nutriment formulae or media
- production and harvest equipment
- production vessels and water treatments
- staff to coordinate
- water sampling tests.

Method of assessment

The following assessment methods are suggested:

- case study analysis
- practical exercises
- project (work or scenario based)
- written or oral short-answer testing.

Guidance information for assessment

This unit may be assessed holistically with RTE3704A Coordinate worksite activities, and other units within a

EVIDENCE GUIDE

qualification.

Range Statement**RANGE STATEMENT**

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.

Cultured or held stock may include:

- 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
- finfish, crustaceans, molluscs, aquatic reptiles, amphibians, polychaete and oligochaete worms, plankton, micro-algae, seaweed, aquatic plants, live rock, sponges and other aquatic invertebrates
- 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
- wild caught or hatchery or nursery reared.

Relevant government regulations, licensing and other compliance requirements may include:

- biodiversity and genetically modified organisms
- biosecurity, translocation and quarantine
- business or workplace operations, policies and practices
- environmental hazard identification, risk assessment and control
- OHS hazard identification, risk assessment and control.

OHS guidelines may include:

- appropriate workplace provision of first aid kits and fire extinguishers

RANGE STATEMENT

- clean, uncluttered, hygienic workplace
- codes of practice, regulations and/or guidance notes which may apply in a jurisdiction or industry sector
- enterprise-specific OHS procedures, policies or standards
- hazard and risk assessment of workplace, 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
- 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.

RANGE STATEMENT	
ESD principles may include:	• control of effluents, chemical residues, contaminants, wastes and pollution • 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 energy use • reducing emissions of greenhouse gases • 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.
PPE may include:	• hard hat or protective head covering • non-slip and waterproof boots (gumboots) or other safety footwear • protective eyewear, glasses and face mask • uniforms, overalls or protective clothing (e.g. mesh and waterproof aprons).
Production schedule may include:	• production vessel or structure to use • production method: • batch • continuous • other • semi-continuous • quality, including bacteria-free, growth rate, size and age • quantities (e.g. cells/ml, organisms/ml) • types of cultures, including species.
Risk factors may include:	• contamination • damage to equipment • equipment breakdown • insufficient cultures • loss of cultures • power loss.

RANGE STATEMENT	
<i>Production vessels or structures</i> may include:	• concrete or earthen ponds • fibreglass or plastic tanks or tubes • glassware • plastic bags • plastic-lined pools.
<i>Other equipment</i> may include:	• aeration, carbon dioxide addition • lights • production vessel holder • temperature-controlled room.
<i>Treated</i> water may include:	• aeration • chemical (e.g. change pH, hardness and salinity) • heating or cooling • micro-filtration • ozone • pre-conditioning (left to stand with aeration).
<i>Inoculation cultures</i> may include:	• brine shrimp (<i>Artemia</i> and <i>Parartemia</i>) • copepods • <i>Daphnia</i> • mosquitoes, beetles or other insects • nematodes • polychaetes or other annelids (worms) • rotifers • various species of micro-algae • zooplankton.
<i>Nutrient formulae or media</i> may include:	• batch or continuous dosing • feeds, including micro-algae, pellets, powders and emulsions • nutrients, fertilisers or other enrichment chemicals or formulae.
<i>Physio-chemical requirements of the culture organism</i> may include:	• carbon dioxide • dissolved oxygen • hardness • light • mechanical or biological filtration • nutrient formulae or media • pH • salinity • temperature • water flow.

RANGE STATEMENT	
<i>Culture health</i> may include:	- contaminants, including ciliates, males in rotifer cultures and unwanted species in micro-algal cultures - density of organisms (numbers per litre or millilitre) - feeding activity - growth and appearance - swimming activity.
<i>Harvesting equipment</i> may include:	- buckets - nets, sieves or screens (mesh size generally below 100µm) - pumps - scoops - siphons.
<i>Wastes</i> may include:	- dead or dying organisms - other contaminants, including soil and organic debris - uneaten nutriment.

Unit Sector(s)

Unit sector	Aquaculture operations
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Co-requisite units

Co-requisite units		

Competency field

Competency field	
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