Australian Government

Department of Education, Employment and Workplace Relations

SFIAQUA214B Produce algal or live-feed cultures

Release: 1

SFIAQUA214B Produce algal or live-feed cultures

Modification History

Not Applicable

Unit Descriptor

Unit descriptor	This unit of competency involves routinely establishing, producing and harvesting algal or live-feed cultures according to facility work procedures. It covers interpreting instructions, using equipment appropriately and making general observations. No licensing, legislative, regulatory or certification requirements apply to this unit at the time of publication.

Application of the Unit

Application of the unit	All enterprise or workplace procedures and activities are carried out according to ***relevant government regulations***, ***licensing and other compliance requirements***, including ***occupational health and safety*** (***OHS***) ***guidelines*** and ***ecologically sustainable development*** (***ESD***) ***principles***. Equipment operation, maintenance, repairs and calibrations are undertaken in a safe manner that conforms to manufacturer instructions. Appropriate ***personal protective equipment*** (***PPE***) is selected, checked, used and maintained.

Licensing/Regulatory Information

Refer to Unit Descriptor

Pre-Requisites

Prerequisite units		

Prerequisite units		

Employability Skills Information

Employability skills	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. Prepare for production	1.1. Requirements of the ***algae or live-feed culture production schedule*** are noted and confirmed with supervisor. 1.2. ***Production vessel or structure*** and ***other equipment*** are collected and checked for serviceability. 1.3. Sub-standard equipment is repaired or replaced according to manufacturer guidelines. 1.4. Hygiene precautions and axenic culture techniques are undertaken.
2. Initiate and maintain cultures	2.1. Production vessel is filled with ***treated water***. 2.2. Inoculation cultures and ***nutriments*** are added. 2.3. ***Physio-chemical requirements of the culture organism*** are maintained for the ***culture period***. 2.4. ***Indicators of culture health*** are monitored and irregularities are reported to the supervisor. 2.5. ***Wastes*** are removed and water levels are maintained. 2.6. Hygienic growing conditions are provided, minimising the risk of contamination. 2.7. Automatic or mechanised equipment are operated and maintained according to work procedures.
3. Harvest culture	3.1. ***Harvesting equipment*** is collected and checked for serviceability. 3.2. Required quantity is harvested and transferred to be fed to predator species. 3.3. Collection vessels are cleaned and sanitised before and after use.
4. Complete post-culture production activities	4.1. Clean up of work area, including repairs and storage of equipment, is supervised and condition report prepared. 4.2. Relevant culture production data, observations or information are recorded legibly and accurately, and any out of range or unusual records checked. 4.3. Compliance and other required reports are prepared and conveyed to senior personnel advising of the effectiveness of culture production, and recommendations made for improvements. 4.4. Feedback on own work performance is sought from supervisor and opportunities to improve identified.

Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE
This section describes the skills and knowledge required for this unit.
Required skills
• adding inoculation cultures and nutriments to production vessels according to enterprise procedures • communicating with supervisor on production activities and on own performance • communicating ideas on possible improvements • harvesting algal or live-feed cultures • maintaining axenic transfer of parent cultures • operating and maintaining production and harvest equipment • providing oral reports to supervisor on algal or live-feed production • recognising and reporting on obvious problems associated with the culture-growing environment and culture health • removing waste and maintaining water levels according to enterprise procedures • using a microscope to examine culture for signs of health. **Literacy skills used for**: • interpreting manufacturer guidelines • interpreting production schedules and labels • recording workplace data related to the production of algal or live-feed cultures • interpreting warning and safety signs. **Numeracy skills used for**: • calculating culture periods • counting or determining density of algal or live-feed culture organisms • diluting to reach desired salinity • estimating weight of small quantities of chemicals • measuring chemical volumes and weights for sanitation • reading gauges and meters.
Required knowledge
• culture periods and life cycles of culture organisms • ESD principles • operation and maintenance of automatic or mechanised equipment • physio-chemical requirements of the culture organisms

REQUIRED SKILLS AND KNOWLEDGE
• procedures for producing and harvesting algal or live-feed cultures • purpose of, and operating procedures for, algal or live-feed culture production and harvest equipment • purpose of nutriments.

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: • follow work procedures and supervisor's instructions for the production process • produce algal or live-feed cultures under routine conditions. Assessment must confirm knowledge of: • basic process for effective production of algal or live-feed cultures, including setting up, initiating and breeding, monitoring health and growth, harvesting and cleaning up activities.
Context of and specific resources for assessment	Assessment is to be conducted at the workplace or in a simulated work environment. It should cover the entire process of production, from establishing the culture through to harvesting. Resources may include: • inoculation cultures and nutriments • production schedule • production vessels • production and harvest equipment • records for documenting algal or live-feed culture production • treated water • work procedures for producing algal or live-feed cultures.
Method of assessment	The following assessment methods are suggested: • practical demonstration • project work • written or oral short-answer testing.
Guidance information for	This unit may be assessed holistically with other units

EVIDENCE GUIDE	
assessment	within a 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.	
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 • 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,

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	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.
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 of 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).
Algae or live-feed culture may include:	• aquatic plants • brine shrimp (*Artemia* and *Parartemia*) • copepods • *Daphnia* • feeder fish, usually goldfish or other inexpensive fish (check state/territory animal welfare laws) • infusions and bio-fouling • inoculation or starter culture, usually an axenic

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	monoculture • micro-algae and seaweed (various species) • mosquitoes, beetles or other insect (adult or larvae) • nematodes • polychaetes, oligochaetes and other worms • rotifers • zooplankton.

Production schedule may include:	• culture method to be used:
	  • batch
	  • semi-continuous
	  • continuous
	  • enrichment of natural waters
	• production vessel or structure to be used
	• quality, including bacteria free, growth rate, size and age
	• quantities (i.e. cells/ml, organisms/ml) or weights
	• types of cultures, including species, sizes and ages
	• written instructions and work procedures.

Production vessel or structure may include:	• concrete or earthen ponds • fibreglass or plastic tanks • glassware • plastic bags • plastic-lined pools.
Other equipment may include:	• aeration • air filters • autoclave • bottle plugs • counters and microscopes • flexible tubing • greenhouses or hothouses • lights • measuring cylinders • pipettes and syringes • production vessel holder • temperature-controlled room • washing and sterilising equipment • water filtration equipment.

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Treated water may include:	• aeration • chemical (e.g. change pH and hardness) • chlorination and de-chlorination • heating or cooling • micro-filtration • pre-conditioning (e.g. left to stand with or without aeration) • ultraviolet (UV) and ozone.
Nutriments may include:	• feeds, including micro-algae, pellets, powders and emulsions • enrichment formulae • green water • nutrients, fertilisers or other chemicals.
Physio-chemical requirements of the culture organism may include:	• carbon dioxide • chemical, mechanical or biological filtration • dissolved oxygen • hardness • light • nitrogenous wastes and contaminants • pH • salinity • temperature • water flow.
Culture period may include:	• one to several days for brine shrimp • several weeks for micro-algae.
Indicators of culture health may include:	• colour • contaminants, including ciliates, males in rotifer cultures and unwanted species in micro-algal cultures • density of organisms (i.e. numbers per litre or millilitre) • feeding activity • flocculation of culture medium • growth • physical appearance • swimming activity.
Wastes may include:	• dead or dying organisms • other contaminants, including soil and organic debris • uneaten nutriments.

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Harvesting equipment may include:	• collection vessels
	• continuous centrifuge
	• counters
	• live feeds:
	  • buckets
	  • nets, sieves or screens (mesh size generally below 100/mm)
	• micro-algal:
	  • buckets
	  • pumps
	  • siphons
	• pipettes and measuring cylinders
	• washing sieves.

Unit Sector(s)

Unit sector	Aquaculture operations

Co-requisite units

Co-requisite units		

Competency field

Competency field	