

## PRODUCE FISH FEEDS

**ISCED UNIT CODE:** 0831 351 04A

**TVET CDACC UNIT CODE:** AQ/OS/AM/CR/02/4/MA

### UNIT DESCRIPTION

This unit specifies the competencies required to produce fish feeds. It involves the ability to culture natural fish feeds, produce on-farm formulated fish feeds, package and store fish feeds and keep records

<b>ELEMENT</b>	<b>PERFORMANCE CRITERIA</b>
These describe the key outcomes which make up workplace function.	These are assessable statements which specify the required level of performance for each of the elements.  <b><i>Bold and italicized terms are elaborated in the Range</i></b>
1. Culture natural fish feeds	1.1 <b>PPE</b> 's are identified and gathered as per task requirements 1.2 <b>Materials and equipment</b> for producing natural fish foods are identified and gathered based on task requirements and identified food safety risks 1.3 Pond is cleaned, limed, dried and flooded with <b>water fit for aquaculture</b> 1.4 <b>Natural productivity</b> of pond is determined based on secchi depth 1.5 Fish pond is fertilized based according to pond's natural productivity and recommended rates of fertilization while observing food safety
2. Produce on-farm formulated fish feeds	2.1 <b>On-farm feed production materials and equipment</b> are identified and gathered based on task requirements and identified food safety risks 2.2 Feed composition is formulated using Pearson's Square method based on available ingredients and <b>nutrient requirements</b> of target species 2.3 Feed ingredients are subjected to specified <b>treatments</b> to inactivate anti-nutritional factors 2.4 Feed ingredients are milled to fine particles while observing food hygiene standards 2.5 Feed additives where required are added as per standard and statutory requirements

	2.6 Formulated feed proportions are weighed and mixed uniformly 2.7 Feed mixture is pelletized and/or dried to a moisture content of 10% or less
3. Package and store fish feeds	3.1 Fish feed is weighed and packaged in sealed bags with clear <b><i>label details</i></b> 3.2 Dry fish feeds are stored in cool and dry areas 3.3 Moist fish feeds are properly refrigerated as per the identified food safety risks
4. Keep records	4.1 <b><i>Records of feed ingredients</i></b> are prepared and kept according to site requirements 4.2 Records of prepared feeds are prepared and kept according to site requirements 4.3 Records of food safety parameters are maintained 4.4 Produced feed is fed to target fish at recommended rates 4.5 Fish growth rate is monitored according to <b><i>sampling plan</i></b> 4.6 Records are kept of fish growth response to feed

## RANGE

This section provides work environments and conditions to which the performance criteria apply. It allows for different work environments and situations that will affect performance.

Variable	Range
1. Sources may include but not limited to:	<ul style="list-style-type: none"> <li>• Ingredients used for formulation of feeds</li> <li>• Poor storage conditions</li> <li>• Pests</li> <li>• Rodents</li> <li>• Agrochemicals</li> </ul>
2. Contamination/hazards may include but not limited to:	<ul style="list-style-type: none"> <li>• Physical hazards</li> <li>• Chemical hazards <ul style="list-style-type: none"> <li>• Heavy metals</li> <li>• Pesticides</li> <li>• Industrial chemicals</li> </ul> </li> <li>• Biological hazards <ul style="list-style-type: none"> <li>• Aquatic animal diseases</li> </ul> </li> <li>• Naturally occurring toxins</li> </ul>

3. Water fit for aquaculture include but not limited to	<ul style="list-style-type: none"> <li>• Fish species specific recommended level of chlorine</li> <li>• Fish species specific Recommended pH range</li> <li>• Fish species specific Recommended Ammonia</li> <li>• Fish species specific recommended turbidity level</li> <li>• Free of infective pathogens</li> </ul>
4. PPE's include but not limited to	<ul style="list-style-type: none"> <li>• Safety goggles, gum boots, helmets, gloves, dust coats, first aid kits, mouth piece</li> </ul>
5. Materials and equipment include but not limited to:	<ul style="list-style-type: none"> <li>• Fertilizers, secchi disk, weighing scale</li> <li>• Buckets , gunny bags, sticks, stakes</li> </ul>
6. Natural productivity include but not limited to:	<ul style="list-style-type: none"> <li>• Phytoplankton</li> <li>• Zooplankton</li> </ul>
7. On-farm feed production materials and equipment include but not limited to:	<ul style="list-style-type: none"> <li>• Meat mincer, blender/ grinder, weighing scale, dryer, mixer, containers, bag sealer, oven, burner, drying racks</li> <li>• Packaging bags, drying canvas/ polythene</li> </ul>
8. Nutrient requirements include but not limited to:	<ul style="list-style-type: none"> <li>• Proteins,</li> <li>• Lipids/fats</li> <li>• Ash</li> <li>• Carbohydrates</li> <li>• Moisture</li> <li>• Mineral and vitamin</li> </ul>
9. Treatments include but not limited to:	<ul style="list-style-type: none"> <li>• Roasting</li> <li>• Boiling</li> <li>• Fermentation</li> <li>• Sun-drying</li> </ul>
10. Label details include but not limited to:	<ul style="list-style-type: none"> <li>• Date of manufacture</li> <li>• name of manufacturer</li> <li>• date of expiry</li> <li>• storage conditions</li> <li>• protein level</li> <li>• pellet size,</li> <li>• species.</li> </ul>
11. Records of feed ingredients include but not limited to:	<ul style="list-style-type: none"> <li>• Types</li> <li>• Date procured</li> <li>• Store quantities</li> </ul>

12. Sampling plan includes but not limited to:	<ul style="list-style-type: none"> <li>• Sampling frequency</li> <li>• Sample size</li> <li>• Sampling time</li> </ul>
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## REQUIRED SKILLS AND KNOWLEDGE

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

### Required Skills

The individual needs to demonstrate the following skills:

- Trouble shooting
- Use of tools and equipment
- Measurement
- Mixing ingredients
- Communication
- Basic first aid
- Numeracy

### Required Knowledge

The individual needs to demonstrate knowledge of:

- Regulatory bodies/ Competent authorities
- Hazard Analysis Critical Control Point (HACCP)
- Types of tools, equipment and PPEs
- On-farm fish feed formulation
- Locally available raw materials
- Nutritional composition of the raw materials and their properties

## EVIDENCE GUIDE

This provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge and range.

1. Critical Aspects of Competency	<p>Assessment requires evidence that the candidate:</p> <ul style="list-style-type: none"> <li>1.1 Implemented fish feed production food safety plan</li> <li>1.2 Used secchi disk accurately</li> <li>1.3 Formulated feed composition correctly as per target species</li> <li>1.4 Applied the correct fertilizer at right amounts using appropriate method</li> <li>1.5 Applied the right treatment to inactivate anti-nutritional factors in selected feed ingredients</li> </ul>
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	<p>1.6 Weighed accurate amounts of feed ingredients based on feed formulation</p> <p>1.7 Mixed feed ingredients uniformly</p> <p>1.8 Stored produced feed under recommended storage conditions</p>
2. Resource Implications for competence certification	<p>The following resources must be provided:</p> <p>2.1 Access to relevant workplace where assessment can take place</p> <p>2.2 Appropriately simulated environment where assessment can take place</p> <p>2.3 Materials relevant to the proposed activity or tasks</p>
3. Methods of Assessment	<p>Competency may be assessed through:</p> <p>3.1 Observation</p> <p>3.2 Oral presentation</p> <p>3.3 Oral questioning</p> <p>3.4 Projects</p> <p>3.5 Written tests</p>
4. Context of Assessment	<p>Competency may be assessed on the job, off the job or a combination of these. Off the job assessment must be undertaken in a closely simulated workplace environment.</p>
5. Guidance information for assessment	<p>Holistic assessment with other units relevant to the industry sector, workplace and job role is recommended.</p>