

MANAGE FISH HATCHERY

UNIT CODE: AQ/OS/AT/CR/03/6/B

UNIT DESCRIPTION

This unit specifies the competencies required to manage fish hatchery. It involves conducting fish hatchery food safety risk assessment, developing fish hatchery food safety risk management plan, preparing hatchery to receive new stock, managing broodstock, producing fingerlings, maintaining hatchery facility, and monitoring and evaluating implementation of fish hatchery food safety management plan

ELEMENT These describe the key outcomes which make up workplace function.	PERFORMANCE CRITERIA These are assessable statements which specify the required level of performance for each of the elements. <i>Bold and italicized terms are elaborated in the Range</i>
1. Conduct fish hatchery food safety risk Assessment	1.1 Food safety <i>Hazards</i> in the fish hatchery are identified and documented 1.2 Possible <i>sources</i> of physical, chemical and microbial contamination in the hatchery are identified based on the hazards 1.3 Level of risk is assessed and established as per fish codes of practice and standards
2. Develop fish hatchery Food Safety Risk Management Plan	2.1 <i>Preventive measures</i> for fish hatchery hazards are established as per identified source of contamination and manual of standard operating procedures 2.2 <i>Corrective measures</i> for fish hatchery hazards are established as per identified source of contamination and manual of standard operating procedures 2.3 Standard operating procedures for preventing and correcting fish hatchery food safety risks are developed based on the identified risks. 2.4 Fish hatchery food safety status is evaluated based on statutory requirements and standards 2.5 Risk is communicated as per policies for internal and external communication 2.6 Approval and certification of fish hatchery food safety status is sought from relevant certification bodies based on <i>statutory requirements</i> and <i>food safety standards</i>
3. Prepare hatchery to	1.1 PPE's are identified and gathered as per task requirements

receive new stock	<p>1.2 Tools, equipment and materials are assembled as per task requirements</p> <p>1.3 Ponds are drained to dryness, limed and filled with water as per standard operating procedures.</p> <p>1.4 Happa nets are washed, disinfected, dried and set in the ponds</p> <p>1.5 Tanks are cleaned, disinfected and filled with water as per standard operating procedures</p>
4. Manage broodstock	<p>4.1 Broodstock is identified and sourced from either government authenticated hatcheries or the wild based on desirable features for initial stocking</p> <p>4.2 Broodstock is acclimatized based on culture unit temperatures</p> <p>4.3 Broodstock is quarantined based on information on possible infections from the source</p> <p>4.4 Broodstock is sorted and stocked into broodstock ponds based on maturity stage and stocking density specific to the species</p> <p>4.5 Selection of ripe breeders is carried out from existing broodstock based on <i>state of readiness</i> as determined by physical appearance</p> <p>4.6 Brood stock is fed at maintenance ratio</p> <p>4.7 Water quality parameters are monitored at regular intervals and corrective action taken as per manual of standard operating procedures</p> <p>4.8 Broodstock are monitored for signs of infections and stress</p> <p>4.9 Old broodstock are continuously replaced based on age and productivity</p>
5. Produce fingerlings	<p>5.1 Breeding facilities are cleaned and filled with water as per standard operating procedures</p> <p>5.2 Selection of ripe breeders is carried out from existing broodstock based on readiness as determined by physical appearance and number of fingerlings required</p> <p>5.3 Selected breeders for natural breeding are transferred to breeding facilities based on species specific stocking density</p> <p>5.4 Selected breeders for artificial propagation are treated with hormones to induce breeding as per manual of standard operating procedures</p> <p>5.5 Stripping, fertilization and incubation of eggs is carried out using standard procedures</p> <p>5.6 Live feeds are cultured based on standard procedures</p> <p>5.7 Hatchlings are nursed based on optimum water quality parameter ranges and nutritional requirements</p> <p>5.8 Hormone treated feed is prepared as per recommended</p>

	<p>mixing ratios of hormone to feed</p> <p>5.9 Tilapia hatchlings are sex reversed to males using hormone treated feed as per manual of standard operating procedures</p> <p>5.10 Fish fry are graded regularly by size based on growth rates and stocking density</p> <p>5.11 Fingerlings are harvested and packaged based on distance from the hatchery</p>
6. Maintain hatchery facility	<p>6.1 Functionality of plumbing works assessed in terms of water flow rates and absence of leakages</p> <p>6.2 Cleaning schedule developed and implemented for the hatchery</p> <p>6.3 Water quality parameter ranges are maintained within optimum levels</p> <p>6.4 Repairs on hatchery facilities are carried out based on identified faults</p>
7. Monitor and evaluate implementation of fish hatchery food safety management plan	<p>7.1 Level of hazards in the fish hatchery is monitored regularly to ensure they are within control as per manual of standard operating procedures</p> <p>7.2 Approval and certification of fish hatchery is maintained as per relevant certification bodies based on statutory requirements and standards</p>

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. Hazards may include but not limited to:	<ul style="list-style-type: none"> • Physical • Chemical <ul style="list-style-type: none"> ○ Heavy metals ○ Pesticide residues • Microbial <ul style="list-style-type: none"> ○ Parasites ○ Viruses ○ Bacteria ○ Hormones • Fish tags

<p>2. Sources of contamination may include but not limited to:</p>	<ul style="list-style-type: none"> • Infected parent stock/ broodstock • Poor water quality • Human carriers • Cleaning agents • Pesticides • Antibiotics misuse
<p>3. Preventive measures may include but not limited to:</p>	<ul style="list-style-type: none"> • Quarantine of brooders • Good water quality • Sanitary and phytosanitary measures • Biosecurity measures
<p>4. Corrective measures may include but not limited to:</p>	<ul style="list-style-type: none"> • Parasite control • Fish treatment • Water quality management • Sterilization of the hatchery
<p>5. Statutory requirements may include but not limited to:</p>	<ul style="list-style-type: none"> • Compliance to standards and regulations • Kenya Fisheries Service • County Government • The Fisheries Management and Development Act No.35 of 2016. • The Codex Alimentarius Food Hygiene Basic Texts; • The Food Drugs and Chemical Substances Act Cap. 254 of the Laws of the Kenya; • The Pest Control Products Act, Cap. 346 of the Laws of Kenya; • The Public Health Act, Cap. 242 of the Laws of Kenya; • The Environmental Management and Co-ordination Act, 1999.
<p>6. Food safety standards may include but not limited to:</p>	<ul style="list-style-type: none"> • Codes of practice • Principles of food hygiene • Recommended guidelines • Specifications for maximum limits for hazards
<p>7. PPE's may include but not limited to:</p>	<ul style="list-style-type: none"> • Safety goggles, gum boots, wading suit, gloves, dust coats, first aid kits, life ring, life jacket
<p>8. Tools and equipment may include but not limited to:</p>	<ul style="list-style-type: none"> • Dissecting kit, weighing balance, pair of pincers, pestle and mortar, needle and syringe, measuring cylinders, , hatching jars, larval rearing trays, perforators, basins, harvesting gear, happa nets, buckets, scoop nets, water test kits, refrigerator, air pump and stone diffusers, plankton nets, light bulb, submersible heater, thermometer, fluorescent light

9. Materials may include but not limited to:	<ul style="list-style-type: none"> • Salt, towel, egg substrates, warm water, anaesthesia, 17-α Methyl Testosterone, feeds, fertilizers, ethanol, acetone, vials, cotton wool, assorted bowls, hypochlorite solution
10. State of readiness may include but not limited to:	<ul style="list-style-type: none"> • Ready to spawn (swollen abdomen), not yet ready, already spawned
11. Water quality parameters may include but not limited to:	<ul style="list-style-type: none"> • Dissolved oxygen • Temperature • pH • ammonia • nitrite • alkalinity • turbidity
12. Breeding facilities may include but not limited to	<ul style="list-style-type: none"> • Earthen ponds, happa nets, concrete tanks, plastic tanks,
13. Hormones may include but not limited to:	<ul style="list-style-type: none"> • Pituitary extract, synthetic hormones
14. Live feeds may include but not limited to	<ul style="list-style-type: none"> • Artemia • Copepods • Rotifers • Algae
15. Cleaning schedule may include but not limited to:	<ul style="list-style-type: none"> • Types of cleaning and disinfection agents • Procedure followed in cleaning • Frequency of cleaning • Personnel involved
16. Repairs may include but not limited to:	<ul style="list-style-type: none"> • Fixing leakages in ponds, pipes, tanks • Fixing damaged happa and harvesting nets

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:

- Food safety risk assessment and communication
- Training skills
- Use of tools and equipment
- Weighing

- Numeracy
- Fish handling and packaging
- Dissection
- Identification of anatomical features
- Stripping and injection
- Basic first aid
- Hand sexing of brooders
- Identification of signs of healthy fish
- Testing water quality
- Preparation of hormone treated feed

Required Knowledge

The individual needs to demonstrate knowledge of:

- Food safety standards
- Hazard Analysis Critical Control Points (HACCP)
- Food Safety Hazards in Aquaculture
- Good aquaculture practices
- Good hygiene practices
- Safety precautions
- Principles of food hygiene
- National legislations and regulations
- Types of tools, equipment and PPEs
- Use of water test kits and equipment
- Fish breeding
- Basic fish anatomy and physiology
- Fish diseases
- Water quality parameters
- Fish feeds and feeding
- Fish hatchery biosecurity

EVIDENCE GUIDE

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

<p>1. Critical Aspects of Competency</p>	<p>Assessment requires evidence that the candidate:</p> <ul style="list-style-type: none"> 1.1 Developed fish hatchery Food Safety Risk Management Plan 1.2 Prepared fish culture facilities for stocking broodstock 1.3 Sourced broodstock with desirable features 1.4 Monitored water physico-chemical parameters using appropriate equipment
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	<ul style="list-style-type: none"> 1.5 Quarantined incoming broodstock in specially designated ponds 1.6 Acclimatized the incoming fish upon arrival on the farm 1.7 Selected ripe breeders for breeding exercise accurately 1.8 Identified and extracted pituitary gland from the donor fish 1.9 Stripped brood fish of maximum possible amount of eggs or milt without spilling or dropping the fish 1.10 Cultured live feeds 1.11 Prepared hormone treated feed as per recommended mixing ratios 1.12 Harvested and graded fry to uniform sizes
2. Resource Implications	<p>The following resources must be provided:</p> <ul style="list-style-type: none"> 2.1 Workplace or assessment location 2.2 PPEs 2.3 Materials, tools, and equipment 2.4 Broodstock
3. Methods of Assessment	<p>Competency may be assessed through:</p> <ul style="list-style-type: none"> 3.1 Observation 3.2 Oral questioning 3.3 Projects 3.4 Written tests 3.5 Portfolio of Evidence 3.6 Interview 3.7 Third party report
4. Context of Assessment	<p>Competency may be assessed:</p> <ul style="list-style-type: none"> 4.1 On-the-job 4.2 Off-the –job 4.3 During Industrial attachment
5. Guidance information for assessment	<p>Holistic assessment with other units relevant to the industry sector, workplace and job role is recommended.</p>