

# **PHILIPPINE NATIONAL STANDARD**

**PNS/BAFS 197: 2025  
ICS 67.120.30**

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## **Penaeid Shrimp and Mangrove Crabs Grow-out — Code of Practice — Good Aquaculture Practices (GAqP)**



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Penaeid Shrimp and Mangrove Crabs Grow-out — Code of Practice — Good  
Aquaculture Practices (GAqP)  
PNS/BAFS 197:2025  
ICS 67.120.30

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## Foreword

The Bureau of Agriculture and Fisheries Standards (BAFS)-Department of Agriculture (DA) was mandated under Section 61 (Bureau of Agriculture and Fisheries Standards) and 62 (Coverage) of Republic Act (RA) No. 8435 (Agriculture and Fisheries Modernization Act [AFMA] of 1997) and Section 16 (Specific Responsibilities of the Department of Agriculture) of RA No. 10611 (Food Safety Act [FSA] of 2013) to set, develop, and implement science-based food safety standards for fresh plants, animals, fisheries, and aquaculture foods including those for organic agriculture. In addition, Rule 16.6 of the Implementing Rules and Regulations (IRR) of RA 10611 further elaborates the role of BAFS in adopting, and/or amending/revising food safety standards and codes of practice for primary and postharvest foods.

As part of its standards development process, the BAFS-Standards Development Division (SDD) subjects the existing Philippine National Standards (PNS) to a review every five years after their promulgation. In 2024, the BAFS-SDD identified the following Good Aquaculture Practices (GAqP)-related for review since these are considered aged and of the same commodity group.

1. Penaeid Shrimp and Mangrove Crabs Grow-Out — Code of Practice — Good Aquaculture Practices;
2. Penaeid Shrimp and Mangrove Crabs Hatchery — Code of Practice — Good Aquaculture Practices; and
3. Giant Freshwater Prawn Hatchery and Nursery — Code of Practice — Good Aquaculture Practices.

In 2024, to accelerate the review of these aged PNS, the DA-BAFS conducted a Table Review, which aims to re-evaluate and validate whether the provisions of the existing PNS are still relevant and effective for current regulatory and market requirements. This allows the Bureau to check and, if necessary, revise or amend the standards, particularly those that pose a risk to consumer safety and could become barriers to trade. The Table Review determined that the aforementioned PNS needs revision, given the significant updates to its scope and several of its critical provisions.

The revision was guided by the Technical Working Group (TWG) officially created under Special Order (SO) No. 745, series of 2025 (Composition of Technical Working Group [TWG] and Project Management Team [PMT] for the Development of the Philippine National Standards [PNS] for Agricultural and Fishery Products and Machinery). The TWG was composed of representatives from the relevant government agencies, academe/research institutions, private sector organizations, and Civil Society Organizations (CSO). The draft PNS underwent a series of TWG writeshops and stakeholder consultations conducted via online platforms before its endorsement to the DA Secretary.

This Standard includes the following significant changes compared to the previous version:

- a) Revision of scope;

- b) Revision of the Normative References and Terms and Definitions;
- c) Addition of Clause “Use”;
- d) Update on the clauses and provisions aligned with the modifications made to PNS/BAFS 135: 2025 (Good aquaculture practices — Code of Practice);
- e) Update on the specific requirements under each clause to improve clarity, relevance, and practical applicability for grow-out operators;
- f) Inclusion of the list of banned antimicrobials in food-producing animals;
- g) Inclusion of the recommended optimum ranges of water quality parameters for penaeid shrimp and crabs grow-out farms; and
- h) Update on the recommended stocking densities for penaeid shrimp and mangrove crabs grow-out farms.

This document cancels and replaces PNS/BAFS 197:2017 (Code of Good Aquaculture Practices [GAqP] for Shrimp and Crab), which has been technically revised. This document was written in accordance with the formatting and editorial rules of the Standardization Guide No.1 (Writing the PNS) developed by the SDD of the BAFS-DA.

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## 1 Scope

This Code of Good Aquaculture Practices (GAqP) for penaeid shrimp and mangrove crabs covers practices that aim to prevent or minimize the risk associated with aquaculture production in ponds and tanks. This Code applies to aquaculture facilities, intended for shrimp and crabs grow-out culture. This Code addresses food safety, animal health and welfare, environmental integrity, and socio-economic welfare and consists of compliance with technical and legal requirements.

## 2 Normative References

The following documents are referred to in the text in such a way that some or all their contents constitute the requirements of this document. The latest edition of the referenced document (including any amendments) applies.

Bureau of Agriculture and Fisheries Standards (BAFS)-Department of Agriculture (DA). (2022a). Establishment of traceability systems for cultured finfishes and crustaceans — Guidelines (PNS/BAFS 338:2022). <https://bafs.da.gov.ph/index.php/approved-philippine-national-standards/>

BAFS-DA. (2022b). Veterinary drug residues in food — Maximum Residue Limit (MRL) (PNS/BAFS 48:2022). <https://bafs.da.gov.ph/index.php/approved-philippine-national-standards/>

## 3 Terms and Definitions

For the purposes of this Standard, the following terms and definitions apply:

### 3.1

#### **aquaculture facilities**

include permanent or semi-permanent systems or structures for breeding, treatment and rearing of aquatic organisms. Aquaculture facilities may exist both in marine waters, inland water environments, and as terrestrial production systems (DA-BAFS, 2025, *modified*; Food and Agriculture Organization [FAO] of the United Nations [UN], n.d.; BAFS-DA, 2025, *modified*)

### 3.2

#### **biosecurity**

set of management and physical measures designed to reduce the risk of introduction, establishment and spread of animal diseases, infections or infestations to, from and within an animal population (World Organization for Animal Health [WOAH], 2018; BAFS-DA, 2025).

**3.3****chemicals**

any substance either natural or synthetic that can affect the live aquatic organism, their pathogens, the water, equipment used in production, or the land within the aquaculture establishment (Codex Alimentarius Commission [CAC], 2020, *modified*)

**3.4****clean water**

water from any source where harmful microbiological contamination, substances and/or toxic plankton are not present in quantities that may affect the safety of fish, shellfish and their products intended for human consumption (CAC, 2020, *modified*)

**3.5****competent authority**

official government agency having jurisdiction (CAC, 2006); also refers to the bureau or agency mandated by law with responsibility and competence for ensuring and supervising the implementation of sanitary and phytosanitary (SPS) measures, regulations, or standards (BAFS-DA, 2025)

**3.6****diseased shrimp and crabs**

shrimp and crabs in which pathological changes or other morphological changes or abnormalities that affect safety and quality are apparent (CAC, 2020, *modified*)

**3.7****feed additive**

chemicals other than nutrients for shrimp and crabs that are approved for addition to their feed (CAC, 2020, *modified*)

**3.8****grow-out**

phase in aquaculture where aquatic organisms are raised from juvenile stage to market size (FAO-UN, 2013, *modified*)

**3.9****Integrated Multi-Trophic Aquaculture (IMTA)**

farming, in proximity, of aquaculture species from different trophic levels and with complementary ecosystem functions, in a way that allows one species' uneaten feed and wastes, nutrients, and by-products to be recaptured and converted into fertilizer, feed, and energy for the other crops, and to take advantage of synergistic interactions between species (Chopin, 2013)

**3.10****nursery**

facility where shrimp postlarvae or crablets are reared to a larger size before stocking in grow-out ponds or net pens under controlled conditions to improve their survival and growth (Bureau of Fisheries and Aquatic Resources [BFAR]-DA, 2023, *modified*)

**3.11****veterinary drug**

any substance applied or administered to any farmed aquatic organisms, whether used for therapeutic, prophylactic, or diagnostic purposes, or for modification of physiological functions or behavior (CAC, 2020, *modified*)

**4****Use**

This Standard adheres to the principles outlined in PNS/BAFS 135:2025 (Good Aquaculture Practices — Code of Practice). It specifically establishes requirements for shrimp and crabs farming. This document shall be used independently and serves as the basis for inspecting shrimp and crabs farms for GAqP certification under relevant regulations of the competent authority.

Other farmed species shall be assessed against existing species-specific GAqP standards. In the absence of such standards, the general provisions of PNS/BAFS 135:2025 shall apply.

**5****Site Selection****5.1****Location****5.1.1**

The location of the grow-out farm shall be in accordance with local and national plans and regulations on environmental protection. As such, the site of grow-out facilities shall be evaluated and permitted based on its distance from ecologically sensitive or protected areas such as mangrove forests, coral reefs, and other biodiversity hotspots. Moreover, the farm shall adhere to zoning laws set by Local Government Units (LGU).

**5.1.2**

All existing, new, and expanding grow-out farms shall secure and present a valid Environmental Compliance Certificate (ECC) or Certificate of Non-Coverage (CNC) in accordance with national regulations.

**5.1.3**

Grow-out facilities should be located in environmentally suitable and sustainable areas where the risk of contamination is minimized or where sources of pollution can be controlled or mitigated according to national law and regulations.

**5.1.4**

Proof of registration (e.g., License To Operate [LTO], or business permit

from the LGU, etc.) and ownership of the farm area (e.g., legal rights and its location map) shall be made available.

## **5.2 Lay-out and design**

**5.2.1** Grow-out facilities should be used primarily for aquaculture purposes only.

**5.2.2** Grow-out design and layout shall integrate biosecurity measures to prevent cross-contamination, disease outbreak, and damage to existing aquatic habitats.

**5.2.3** Toilet facilities and septic systems should be properly installed and constructed to prevent contamination of grow-out facilities.

**5.2.4** Equipment and grow-out facilities should be designed to minimize physical damage to shrimp and crabs during growing and harvesting.

**5.2.5** Vehicles, equipment, and other implements used for feed, stocks, and harvested shrimp and crabs, should be designed to allow adequate cleaning and disinfection.

**5.2.6** Reservoir ponds and tanks for incoming water should be available to ensure a sufficient water supply.

**5.2.7** Settling or treatment ponds for effluent shall be available.

**5.2.8** Buffer zones shall be observed in accordance with existing regulations.

## **6 Facilities, Sanitation, and Waste Management**

### **6.1 Facilities**

**6.1.1** Disposal facilities for wastes should be in suitable and confined areas.

**6.1.2** Fuel, chemical substances (e.g., sanitizer, fertilizers, and reagents), and veterinary drugs should be stored in a storage facility and separated according to the manufacturer's instructions and as specified on the label.

**6.1.3** Regular repair and maintenance should be undertaken to preserve the good physical condition of the facility.

**6.1.4** Appropriate life support systems shall be provided in the grow-out tanks.

**6.1.5** A designated quarantine facility should be established and maintained for the treatment of all diseased shrimp and crabs.

**6.1.6** Mortality pits shall be established for the disposal of diseased, infected, and dead shrimp and crabs.

**6.1.7** Machines used in the facility should be in good condition, and used lubricants shall be placed in an appropriate container and discarded properly.

**6.1.8** A safe and reliable electrical system shall be installed to provide a steady and sufficient power supply.

## **6.2 Sanitation**

**6.2.1** Wild and domesticated animals shall not be allowed in the production area or its vicinity to prevent contaminants (e.g., feces, parasites, pathogens, and other disease vectors).

**6.2.2** Grow-out facilities, their surroundings, equipment, and implements shall be maintained in a clean, hygienic, and good condition to prevent contamination.

**6.2.3** Adequate procedures for cleaning and disinfection of transport vehicles, containers, and equipment shall be in place and implemented.

**6.2.4** Bathrooms and toilets shall be hygienically maintained to prevent contamination of the grow-out facilities.

**6.2.5** Cleaning materials and disinfectants shall be handled properly to prevent contamination or pose no environmental hazards.

**6.2.6** Operators shall manage pests using safe and responsible methods. Pesticides should only be used when necessary, following proper instructions to protect farm workers, farmed aquatic organisms, and the environment.

## **6.3 Waste management**

Waste disposal should be conducted daily and responsibly in accordance with applicable waste management regulations. The grow-out facility shall take appropriate measures to:

- a) dispose wastes in compliance with environmental laws; and
- b) immediately dispose of dead aquatic organisms in a hygienic manner.

## **7 Personnel Health and Hygiene**

**7.1** Workers should be trained on farm-level hygienic practices to ensure awareness of their roles and responsibilities for protecting aquaculture

products from contamination and deterioration throughout the production cycle. This includes the following protocol:

- 7.1.1** Training on Occupational Health and Safety (OH&S) should be conducted for the workers to ensure safer farm work conditions.
- 7.1.2** Workers should wear suitable and appropriate working clothes and protective gear. In areas and conditions where risk is high, protective gear shall be used.
- 7.1.3** Workers shall wash their hands each time before commencing work.
- 7.1.4** An adequate quantity of first aid kits should be available and easily accessible at the production area, and laborers should be able to demonstrate awareness of and apply various first aid measures.
- 7.1.5** Workers should cover wounds with waterproof bandages and wear clean, waterproof gloves or boots when applicable.
- 7.1.6** Smoking, spitting, or drinking alcoholic beverages in the working and storage premises shall not be allowed.
- 7.2** Workers should undergo an annual medical examination to ensure they are fit to work.
- 7.3** Workers who have shown signs of medical problems or conditions that may pose health risks shall be excluded from handling fishery products until deemed certified fit to resume work.

## **8 Grow-out Management**

### **8.1 Grow-out preparation and operation**

- 8.1.1** A written protocol for grow-out operations shall be adopted or developed, and implemented consistently with the existing standards.
- 8.1.2** Practices for the preparation of grow-out facilities should minimize risk for cross-contamination.
- 8.1.3** Biosecurity measures against the entry of pathogens shall be undertaken at all times.
- 8.1.4** Prohibited chemicals or biological substances listed in Annex A (List of banned antimicrobials in food-producing animals) shall not be used in grow-out facility preparation.

- 8.1.5** Fertilizers, prebiotics, and probiotics shall be used in accordance with the manufacturer's instructions.
- 8.1.6** Operators should regularly monitor soil quality parameters to ensure that it is within the optimal range.
- 8.2 Water management**
- 8.2.1** Water used for grow-out should be properly filtered, settled, aerated, and maintained as suitable for the production of shrimp and crabs.
- 8.2.2** Incoming water shall pass through installed screens or filters to prevent the entry of undesirable species.
- 8.2.3** The recommended optimum ranges of water quality parameters, as shown in Annex B (Recommended optimum ranges of water quality parameters for penaeid shrimp and mangrove crabs grow-out farms), should be maintained and regularly monitored to ensure suitability for culture.
- 8.2.4** Water quality shall be periodically examined for hazards.
- 8.3 Stock management**
- Stocking density should be optimum for the species and for the culture system as specified in Annex C (Recommended stocking densities for penaeid shrimp and mangrove crabs grow-out farms).
- 8.4 Feeds and feeding**
- 8.4.1** Operators should implement efficient feeding management by administering appropriate types of feed based on the culture system and its life stage/s.
- 8.4.2** Grow-out operations should include procedures for avoiding feed contamination.
- 8.4.3** Commercial formulated feeds shall be obtained from companies registered by the competent authority, in compliance with existing regulations and in conformity with established standards.
- 8.4.4** Feed ingredients, additives, premixes, and compound feeding stuff shall be obtained from a company registered and monitored by the competent authorities.
- 8.4.5** Non-commercial, feeds such as but not limited to live, fresh, and frozen, farm-formulated feeds, and natural food, should be of good quality and suitable for the species.

- 8.4.6** If fresh diets (e.g., fish, molluscs, chicken entrails, mussel meat, etc.) are used, the protocol on the preparation and administration of such shall be provided.
- 8.4.7** Farm-made aquafeeds should meet the nutrient requirements of shrimp and crabs as presented in the International Aquaculture Feed Formulation Database (IAFFD).
- 8.4.8** Live, fresh, frozen, and natural feeds should be of good quality and should be free of pathogens and contaminants.
- 8.4.9** Live feeds and natural food shall comply with the health certification from in-country trans-boundary movement from the competent authority.
- 8.4.10** Medicated and non-medicated feeds should be stored separately to minimize the risk of feeding to non-target animals.
- 8.4.11** Feed additives and veterinary drugs shall comply with the existing regulations and conform with the existing standards.
- 8.4.12** Only registered probiotics and other biological inputs shall be used in the hatchery.
- 8.4.13** Feeding practices should minimize the risk for biological, chemical, and physical contaminations of feeds and animals.
- 8.4.14** Feeding practices should prioritize the maintenance of water and sediment quality to prevent nutrient overloading and minimize waste.
- 8.4.15** Feeds should be stored properly in a separate facility, which is cool and dry to prevent spoilage, mold growth, and contamination. It should be organized to facilitate a first-in, first-out (FIFO) release and use.

## **8.5 Harvest, postharvest, and transport**

### **8.5.1 Harvest**

- 8.5.1.1** Harvesting equipment and implements shall be cleaned, sanitized, and stored properly.
- 8.5.1.2** Harvesting (either partial or total) should be planned in advance and should be done during the cooler time of the day to minimize stress and mortality of the shrimp and crabs.
- 8.5.1.3** Harvested shrimp and crabs should be quickly and hygienically handled, using practices that do not cause contamination, physical damage, and prolonged stress.

**8.5.1.4** For shrimp products intended to be sold chilled or frozen, practices should ensure rapid slaughtering of harvested shrimp to minimize stress and preserve the quality of the product.

**8.5.1.5** Water and ice used during harvesting should be of a quality suitable for the production of food.

### **8.5.2 Postharvest**

**8.5.2.1** Postharvest equipment and implements shall be cleaned, sanitized, and stored properly.

**8.5.2.2** Postharvest operations should be carried out quickly, hygienically, and without damage to the product.

**8.5.2.3** Food additives and chemicals, which are used in contact with products, shall comply with prevailing legal requirements.

**8.5.2.4** Postharvest wastes should be properly disposed of in designated areas to minimize the risk of cross-contamination.

**8.5.2.5** Clean water should be sufficiently available for handling and cleaning operations.

**8.5.2.6** Ice shall be made from potable water and sourced from approved establishments by the competent authority.

**8.5.2.7** Ice should be received, handled, and stored under good sanitary conditions, which minimize risks of contamination.

**8.5.2.8** Prior to transport, harvested shrimp should be properly chilled and maintained at a temperature range of 0°C to 4°C to preserve freshness, quality, and safety. For live crabs, they should be maintained in a cool (i.e., 24-28 °C) and moist condition.

### **8.5.3 Transport**

**8.5.3.1** Shrimp and crabs should be transported in clean, sanitized, and well-maintained implements, following protocols to prevent contamination from environmental sources such as air, soil, water, oil, and chemicals.

**8.5.3.2** Live shrimp and crabs should be transported under conditions, which ensure their welfare and do not adversely affect their viability. For live shrimp, aerated seawater tanks should be used during transport at 24-28°C. For live crabs, well-ventilated containers should be used. The crabs should be transported in moist conditions, preferably with the addition of a small chunk of ice wrapped in paper, but not directly in contact with the crabs, to maintain

24-28°C. Crabs should be packed close to each other to minimize movement and reduce the risk of damage during transport.

- 8.5.3.3** Shrimp and crabs intended to be sold chilled for human consumption should be transported in compliance with the existing PNS on COP for Shrimp and Crabs.
- 8.5.3.4** Containers used for transporting shrimp and crabs with ice should be designed to allow melted water to drain away from the product, ensuring optimal quality and hygiene.
- 8.5.3.5** All prohibited additives and chemicals shall not be used in contact with live, chilled, or frozen shrimp and crabs.
- 8.5.3.6** Local Transport Permit (LTP) shall be secured from the issuing competent authority prior to transport.

## **9 Animal Health and Welfare**

- 9.1** Operators shall develop and implement an aquatic animal health plan, following the existing protocols of the competent authorities for the health and management of aquatic animals.
- 9.2** Operators shall develop and implement biosecurity measures to effectively manage animal health and prevent the introduction and spread within the farm. Recommended health plan and protocol of the competent authority may be used as reference.
- 9.3** Operators shall adhere to the risk-based animal health surveillance program, which includes both passive and active schemes conducted by the competent authority, to ensure effective monitoring and management of aquatic animal health.
- 9.4** Operators should develop and implement handling protocols during sampling for the general condition of the stocks and harvesting, to promote aquatic animal welfare.
- 9.5** Operators should maintain a suitable culture environment throughout the production cycle of the species being raised to promote aquatic animal welfare.
- 9.6** Operators should have training for animal welfare on farmed aquatic animals.
- 9.7** Shrimp and crabs seedstock, wild-sourced or captive propagated by registered hatcheries, should be of good quality and clinically healthy, as confirmed through screening and testing by the competent authority and its recognized laboratories before stocking.

- 9.8** Veterinary drugs and chemicals shall be used in a responsible manner and in accordance with applicable national legislation or relevant international agreements or guidelines that ensure effectiveness for animal health with consideration of public safety and protection of the environment.
- 9.9** Substances requiring prescription shall only be used under supervision by a qualified expert. Non-prescription substances should be used according to the manufacturer's instructions and as specified on the label.
- 9.10** Treatment and control of diseases using authorized veterinary drugs shall be carried out only based on a proper diagnosis.
- 9.11** For grow-out administering chemicals, withdrawal periods shall be followed. Veterinary drug residues shall be within the limits set in the PNS/BAFS 48:2022 (Veterinary Drug Residues in Food — Maximum Residue Limits).
- 9.12** A quarantine protocol shall be established and implemented to control the spread of diseases.
- 9.13** Diseased or dead shrimp and crabs should be collected immediately and disposed of properly.
- 9.14** Disposal of shrimp and crabs for disease control purposes shall be authorized by the competent authority, and measures for the notification and control of diseases of aquatic animal origin shall be effectively implemented.
- 9.15** Transport of shrimp and crabs shall be in accordance with the existing national regulations to prevent the introduction or transfer of diseases and infectious agents pathogenic to shrimp and crabs.
- 9.16** Use of species in polyculture or Integrated Multi-Trophic Aquaculture (IMTA) systems should be carefully considered to reduce the potential risk of disease transmission.
- 10 Environmental Integrity and Sustainability**
- 10.1** Grow-out activities shall be limited within the designated area for grow-out use based on the approved zoning plan to ensure sustainable resource utilization and maintain the carrying capacity of the ecosystem.
- 10.2** Grow-out workers and operators should be trained in environmental management and mitigation of impact to ensure they are aware of their responsibilities in protecting the environment.
- 10.3** When wild-sourced stocks are used, they shall be collected using responsible practices or in accordance with national laws and regulations where they exist.

- 10.4** Use and production of genetically-modified shrimp and crabs shall be subjected to existing national regulations.
- 10.5** Trapping devices should be installed in areas where potential escapees could occur to reduce the risk of such an event.
- 10.6** Exotic species cultured in controlled conditions shall be used when the competent authority has conducted a risk assessment and determined that their introduction poses no risk to the natural environment, biodiversity, and ecosystem health.
- 10.7** Any exotic species shall be disposed of in a manner that prevents their release into the natural environment.
- 10.8** The use of lethal methods to eradicate predators, particularly those classified as vulnerable, threatened, or endangered under existing regulations, shall be prohibited.
- 10.9** Effective mitigation measures should be taken if the current practices are damaging the habitat or environment.
- 10.10** Measures should be adopted to promote efficient water management and use, as well as proper management of effluents to reduce impacts and shall comply with existing regulations on surrounding land, and water resources.
- 10.11** Discharge water from the grow-out shall be held in effluent, sedimentation, or treatment pond or tank and shall comply with relevant national laws and regulations.
- 10.12** Regular monitoring of the environmental quality of the grow-out facility shall be carried out, and a Self-Monitoring Report (SMR) should be accomplished in accordance with existing regulations, so that effective mitigation measures should be taken if the current practices are damaging the habitat or environment.
- 10.13** Operators shall participate in the rehabilitation of damaged natural surroundings caused by their grow-out operations.
- 11 Socio-Economic Aspects**
- 11.1** Workers shall receive fair treatment, salaries, mandatory benefits, and incentives consistent with existing laws and regulations, or any related agreements between the employer and the workers.
- 11.2** Living quarters of stay-in labor should be safe, clean, in good habitable condition, and convenient.

- 11.3** Potable water in adequate supply and appropriate suitable toilet facilities should be available and properly maintained.
- 11.4** Grow-out operations shall observe the rights of host local communities minimizing potential adverse impacts on public land, infrastructures, fishing grounds, and water resources, following existing laws and regulations.
- 11.5** Workers shall not be discriminated against based on gender, race, religion, culture, age, etc.
- 11.6** Harmonious, productive, and mutually beneficial relationships with the local community should be maintained to foster responsible business social responsibility.
- 11.7** A proactive anti-child labor policy should exist in the farm and shall be compliant with the existing regulations and other applicable regulations.

## **12 Traceability and Record Keeping**

For traceability purposes, the records specified in Annex A of PNS/BAFS 338:2022 (Establishment of Traceability System for Cultured Finfishes and Crustaceans – Guidelines), among other relevant records, should be kept and maintained for at least 24 months.

**Annex A**  
(Normative)

**List of banned antimicrobials in food-producing animals (BAFS-DA, 2025)**

<b>Regulations</b>	<b>Title</b>
BFAR Administrative Circular No. 256, series of 2015	Declaring malachite green and gentian violet as health hazards and prohibiting their use in food fish production and trade
DA Administrative Order (AO) No. 14, series of 2003	Ban on the use in food animals of beta-agonist drugs used in humans as bronchodilator and tocolytic agents
Department of Health (DOH) and DA Joint AO No. 2, series of 2000	Declaring ban/phase out of the use of nitrofurans in food-producing animals
DOH AO No. 4-A and DA AO No. 1, series of 2000	Banning and withdrawal of olaquinox and carbadox from the market
DOH AO No. 91 and DA AO No. 60, series of 2000	Declaring ban on the use of chloramphenicol in food-producing animals
DA Administrative Order (AO) No. 14, series of 2003	Banning on the use in food animals of beta-agonist drugs used in humans as bronchodilator and tocolytic agents

**Annex B**  
(Informative)

**Recommended optimum ranges of water quality parameters for penaeid shrimp and mangrove crabs grow-out farms**

**Table B.1.** Optimum water and soil parameters for shrimp (Jory, 2019)

Parameters	Value
Temperature	25–30 °C
Salinity ( <i>Penaeus monodon</i> )	16–32 ppt
Salinity ( <i>Litopenaeus vannamei</i> <sup>a</sup> )	15–25 ppt
Dissolved oxygen	≥4 ppm
pH	7.5–9.0
Transparency	30–50 cm
Alkalinity	100–200 ppm
Total ammonia-N	0.1–1.0 ppm
Unionized ammonia	≤ 0.2 ppm
Nitrate (NO <sub>3</sub> )	0.6–1.2 ppm
Nitrite (NO <sub>2</sub> )	≤ 0.5 ppm
Total Nitrogen	0.6–2.5 ppm
Phosphate	0.2–0.5 ppm
Silicate	1.0–4.0 ppm
Hydrogen sulphide (H <sub>2</sub> S)	≤ 0.1 ppm
Magnesium	900 ppm
Calcium	300 ppm
Soil pH	7.0–8.5
Organic Matter	3–10%
<sup>a</sup> Formerly known as <i>Penaeus vannamei</i>	

**Annex B**  
(Informative)

**Recommended optimum ranges of water quality parameters for penaeid shrimp and mangrove crabs grow-out farms**

**Table B.2.** Optimum water and soil parameters for crabs (The Mangrove Crab Technical Committee 2018, 2021)

<b>Parameters</b>	<b>Value</b>
Temperature	27–31 °C
Salinity	20–30 ppt
Dissolved oxygen	≥5 ppm
pH water	7.5–8.5
pH soil	6.5–8.5
Hydrogen sulphide	0.004 ppm
Unionized ammonia	0.10 ppm
Nitrite	0.01 ppm
Organic matter	1–10 %
Transparency	20–30 cm

**Annex C**  
(Informative)

**Recommended stocking densities for penaeid shrimp and mangrove crabs  
grow-out farms**

**Table C.1.** Recommended stocking densities for shrimp grow-out farms (BFAR-DA, 2022)

Species	Stocking density (pcs/sqm)		
	Extensive	Semi-intensive	Intensive
<i>Penaeus monodon</i>	1–10	10–20	20–30
<i>Litopenaeus vannamei</i> <sup>c</sup>	1–30	40–60	70–90 <sup>a</sup> 100–140 <sup>b</sup>
<sup>a</sup> earthen <sup>b</sup> lined <sup>c</sup> Formerly known as <i>Penaeus vannamei</i>			

**Table C.2.** Recommended stocking densities for crab grow-out farms (The Mangrove Crab Technical Committee 2018, 2021)

Species	Stocking density (pcs/ha)	
	Extensive	Polyculture <sup>a</sup>
a. <i>Scylla serrata</i> ; b. <i>S. olivacea</i> ; c. <i>S. tranquebarica</i> ; and d. <i>S. paramamosain</i>	800–1500 <sup>b</sup>	500–1000
<sup>a</sup> polyculture with fish <sup>b</sup> thinning out of the population is done after 2–3 months when survival is till high		

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