

# CODE OF CONDUCT

For Selected 10 Segments of the  
Shrimp Aquaculture Industry in Bangladesh

*Originally prepared and further revised  
by*



**Department of Fisheries  
Government of Bangladesh**



**Bangladesh Shrimp and Fish Foundation**

*in consultation  
with*

global aquaculture  
**the alliance**

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CODE OF CONDUCT  
For Various Segments of the Aquaculture-Based Shrimp Industry in  
Bangladesh

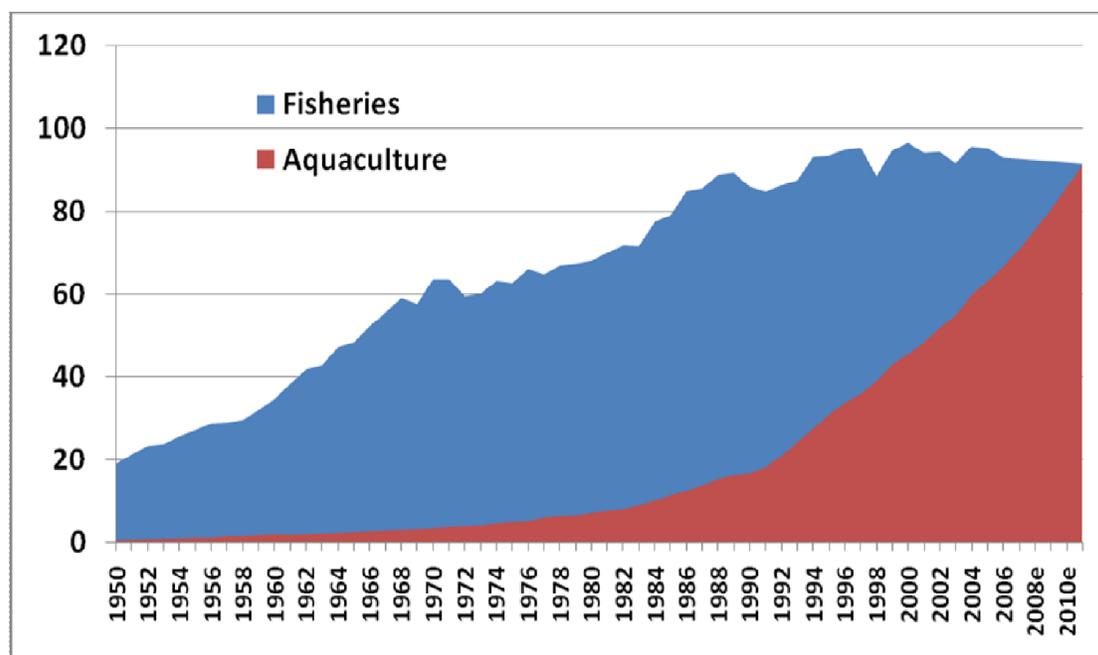
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## INTRODUCTION

### Background

Due to natural and varied man-made changes, the open-water fish production from the world oceans and inland waters is now declining. Aquaculture has been receiving more and more attention for increasing fish production. In 1950, about 3% of the global fish production was of aquaculture origin. By 2004, aquaculture production accounted for 38% of the global total production. Currently, global aquaculture production almost equals the total fish landing from the marine and inland open waters. In the future, aquaculture production is expected to surpass the open water catch. Nearly, 80% of the aquaculture production comes from Asian countries. Bangladesh Fisheries Sector Road Map 2015 projects a total production of 3.54 million metric tons of fish of which an estimated 57 percent will be of aquaculture origin. Out of the total export earnings from the shrimp export, aquaculture products contribute at least 90 percent.



Despite its significant contribution to the global food production and economy, aquaculture is not beyond criticism, often for valid reasons. The main points of concern relate to:

- Environmental stewardship
- Social: Legal and Community
- Food and Feed Safety
- Traceability

The **environmental issues** relate mainly to:

- (i) Mangrove and wetland destruction.

- (ii) Bio-diversity destruction by mass collection of shrimp post-larvae along with myriad of miscellaneous non-target aquatic organisms from the sea-shore and brackish water rivers; the latter are just wasted.
- (iii) Effluent discharge often with heavy loads of silt and organic matter offsetting the balance of the aquatic environment.
- (iv) Releasing prohibited or harmful chemicals used in the shrimp or fish farms.
- (v) Salinization of agriculture land.
- (vi) Releasing diseased farm animals or exotic species from the farm into the open environment.

**Social issues and resource use conflicts** mainly include:

- (i) Obstruction of common property wetlands and flowing rivers and canals for aquaculture.
- (ii) Salt water intrusion in agricultural lands affecting agricultural crops.
- (iii) Unauthorized use of others' land.
- (iv) Using child labour.

**Food safety issues** chiefly relate to:

- (i) Use of agricultural pesticides that may access to aquaculture areas
- (ii) Prohibited or restricted drugs and chemicals often used as preventive, curative or growth promoting agents in the farm feed or water, eventually gain access into the shrimp and fish and ultimately into human consumers.

**Traceability**

- (i) Proper documentation of all aspects of the value chain.

In the context of Bangladesh, the *points that are more frequently raised in connection with coastal aquaculture of the shrimp* are the following:

- (i) Legal ownership of the farm – Regulatory
- (ii) Social conflicts on the use of common properties
  - Water usage conflicts
  - Agricultural land use conflicts
- (iii) Conflicts between the rice farmers and shrimp farmers
- (iv) Environmental degradation
- (v) Labour law violations
- (vi) Use of hazardous chemicals in aquaculture risking food and feed safety

Many countries now realize the problems and appreciate the need of applying modern science, aquaculture techniques, experience, and good governance to rectify the problems and harness the full benefits of aquaculture. International organizations, including FAO/UN have suggested a number of principles for responsible aquaculture to address and rectify the problems stated above. Many countries have now formulated laws to protect the environment and health of the people. Some organizations or countries have taken a proactive approach and prepared Codes of Conduct for aquaculture.

### **What is a Code of Conduct?**

A Code in the field of aquaculture industry is a set of prescribed rules and practices that one or all individuals of an organization or facility must properly comply to achieve a certain desired goal.

The principal objectives of the present work are to prepare a set of code of conduct for various segments of the shrimp aquaculture industry in Bangladesh to help ensure (i) food safety by minimizing biological and chemical risks and hazards that are likely to affect human health, (ii) traceability of the food, and (iii) environmental sustainability and bio-diversity, labour standard and social harmony at each step of the value chain.

All these issues are very important for sound and sustainable development of the industry providing safe, environmentally sustainable, and socially acceptable shrimp and other fisheries products for domestic consumption as well as export.

These Codes of Conduct are standards or regulations defining minimal, internationally acceptable, operations and management practices pertaining to technical, environmental, and social standards. The Codes have been developed by the Bangladesh Shrimp and Fish Foundation reflects five key areas:

- Social responsibility
- Human rights and labour rights
- Environmental sustainability
- Food and feed safety
- Traceability

The Codes are intended to promote aquaculture production which meets international food safety standards, is sustainable, ecologically sound and socially responsible.

BSFF, in collaboration with DoF, has prepared Codes of Conduct for the following segments of the shrimp industry:

- (1) Black tiger or Bagda shrimp (*Penaeus monodon*) hatchery
- (2) Galda shrimp (*Macrobrachium*) hatchery
- (3) Black tiger or Bagda shrimp (*Penaeus monodon*) farm
- (4) Galda shrimp (*Macrobrachium*) farm
- (5) Shrimp / Fish feed mill

- (6) Shrimp collection and service centre or depot
- (7) Ice plants
- (8) Fishing boats
- (9) Shrimp or fish carrier transport van / vessel

**Reference documents used:**

Preparations of the above Codes have been based on the review of the following documents:

1. International Principles of Responsible Aquaculture UN/FAO/UNEP/World Bank- Netherland funded WWF- 2003
2. US Food and Drug Administration food safety regulations
  - a) Federal Food, Drug, and Cosmetic Act (FDCA)
  - b) The U.S. Code of Federal Regulations, Title 21 Food and Drugs
  - c) Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA)
3. EU food and feed safety regulations
  - a) Council Directive 2002/99/EC laying down the animal health rules governing the production, processing, distribution and introduction of products of animal origin for human consumption
  - b) Council Regulation (EC) No 1935/2004 on materials and articles intended to come into contact with food
  - c) Council Regulation (EC) No 852/2004 on the hygiene of foodstuffs
  - d) Council Regulation (EC) No 853/2004 laying down specific hygiene rules for food of animal origin
  - e) Regulation (EC) No 1332/2008 on food enzymes
  - f) Council Regulation (EC) No 1333/2008 on food additives
  - g) Regulation (EC) No 1334/2008 on flavoring and certain food ingredients with flavoring properties
  - h) Regulation (EC) 854/2004 laying down specific rules for the organization of official controls on products of animal origin intended for human consumption
  - i) Commission Regulation (EC) 1251/2008 implementing Council Directive 2006/88/EC as regards conditions and certification requirements for the placing on the market and the import into the Community of aquaculture animals and products thereof and laying down a list of vector species
  - j) Commission Regulation (EC) 2074/2005 laying down implementing measures for certain products under Regulation (EC) 853/2004 of the European Parliament and of the Council and for the organisation of official controls under Regulation (EC) 854/2004 of the European Parliament and of the Council and Regulation (EC) 882/2004 of the European Parliament and of the Council, derogating from Regulation (EC) 852/2004 of the European Parliament and of the Council and amending Regulations (EC) 853/2004 and (EC) 854/2004

- k) Council Directive 97/78/EC laying down the principles governing the organization of veterinary checks on products entering the Community from third countries
  - l) Council Regulation (EC) 1005/2008 establishing a Community system to prevent, deter and eliminate illegal, unreported and unregulated fishing
  - m) Regulation (EC) No 1907/2006 concerning the Registration, Evaluation, Authorization and Restriction of Chemicals
4. Best Aquaculture Practices formulated by Global Aquaculture Alliance (GAA)
  5. Code of Conduct: Seal of Quality Program of USAID/ATDP-II
  6. Good Aquaculture Practices (GAQPs) – JIFSAN
  7. Fish & Fish Products' Inspection and Quality Control Ordinance 1983
  8. Fish & Fish Products' Inspection and Quality Control Rules 1997 and Rules Amended in 2008
  9. Bangladesh Labour Law 2006
  10. Fish and Shrimp Hatchery Law 2010
  11. Fish and Animal Feed Law 2010
  12. Thailand Department of Fisheries Code of Conduct (COC) and Good Aquaculture Practices (GAP) Program

**While developing the Codes, the EU and the US FDA food safety requirements and international buyers' demands were particularly kept in mind**

## **1. BLACK TIGER OR BAGDA SHRIMP (*PENAEUS MONODON*) HATCHERY**

### **1.1 LEGAL OWNERSHIP AND RIGHT TO THE USE OF THE HATCHERY LAND AND INFRASTRUCTURE**

Human rights, including resources rights of local populations should be respected in accordance with all relevant national laws and international treaties. In particular, agricultural lands to be converted to shrimp hatchery should not be acquired by coercion. The terms of all leases should be respected. The rights of local communities particularly those involved in subsistence and small scale fishing and agriculture to a secure and just livelihood must be respected.

**1.1.1** Hatchery operator must have a legal document indicating that he has the legal right to use the hatchery either as an owner or as a leaseholder.

**1.1.2** In case the hatchery operator is a leaseholder, he must have (a) a current lease document with clearly spelt out conditions and signed both by the lease holder and the hatchery owner and (b) a lease money clearance certificate from the hatchery owner.

**1.1.3** Both hatchery owner and lessee must have a copy of the lease document with details of lease conditions and signed by each party and at least one witness for each party.

### **1.2 REGISTRATION WITH AND LICENSE FROM AN APPROPRIATE ORGANIZATION**

**1.2.1** Hatchery must be registered with, and approved by the Department of Fisheries or any organization authorized by the Government of Bangladesh

**1.2.2** License to the hatchery may only be issued, or renewed, provided the hatchery complies with applicable regulations on food safety, hygiene standards, social responsibilities, environmental sustainability and local development plans

### **1.3 HARMONY WITH THE COMMUNITY**

**1.3.1** Hatcheries shall work in harmony with the local community.

**1.3.2** Hatcheries shall not create any obstacles for the local communities to access the public mangrove areas, fishing grounds or other public resources.

**1.3.3** Hatcheries' sea water intake and outlet pipes, wells or other structures shall not cause erosion or other physical damage to the shoreline or beachfront where they are located.

**1.3.4** Hatcheries shall not interfere with other normal activities of the local community.

### **1.4 LABOUR STANDARD COMPLIANCE**

**1.4.1** Hatchery shall comply with National Labour Law applicable to hatcheries.

- 1.4.2 Hatchery shall compensate all workers according to applicable national regulation. Payroll and/or compensation records shall be maintained for all employees and be available for inspection.
- 1.4.3 Hatchery shall not employ child labour.
- 1.4.4 There shall be no discrimination, abuse, or harassment based on gender, age, or religion in employment, including hiring, salary benefits, advancement, discipline, termination or retirement.
- 1.4.5 Workers who take maternity leave must not face dismissal nor threat of dismissal, loss of seniority or deduction of wages and must be able to return to their former employer at the same rates of pay and benefits.
- 1.4.6 There must not be any use of bonded or forced labour.
- 1.4.7 Facility owners and employees shall respect the religious, cultural, and traditional beliefs and practices of the local community.

## **1.5 WORKERS' HEALTH AND HYGIENE ISSUES**

Working conditions (and employee living conditions, where applicable) shall be safe and healthy for all workers in accordance with national laws and regulations and International Organization standards. Employers must conduct risk assessments to identify hazards and any risk to the health and safety of the employees, take reasonable steps to eliminate or control these risks, and inform, educate, and protect the employees from these risks.

- 1.5.1 Workers handling brood-stocks and PL shall have a valid and current medical certificate that verifies that they are not suffering from any contagious or communicable disease.
- 1.5.2 A person with a contagious or communicable disease shall not be permitted access into the hatchery.
- 1.5.3 Workers shall be instructed and/or trained in animal health as relates to the hatchery, and food, personal hygiene, and sanitation matters related to their work activities. All training shall be properly documented, as follows:
  - Training location, date and subject material
  - Name and qualifications of Trainer
  - Names and responsibilities of attendees
- 1.5.4 Workers shall be provided with adequate training in the application of the good hatchery practices, HACCP principles and good hygiene practices.
- 1.5.5 Workers shall wear neat, tidy, and sanitary clothing while working in the hatchery.
- 1.5.6 Hatchery shall have an adequate number of flush lavatories (toilets) and the lavatories must not open directly into the working areas.

- 1.5.7 Hatchery shall have an adequate number of wash basins with hand cleaning and disinfecting agents at the entry of the hatchery and adjacent to the toilets.
- 1.5.8 Hatchery shall have disinfecting foot baths at the entry of the hatchery.
- 1.5.9 Cleaning and disinfecting agents shall only contain chemicals that are approved by national and international government agencies for such approved uses.

## 1.6 ENVIRONMENTAL PROTECTION AND SUSTAINABILITY

The industry will promote responsible and sustainable management practices to ensure the preservation and enhancement of the natural environment. Facilities shall not damage or alter the conditions of coastal wetlands, mangroves, or seagrass beds or other ecological communities near the production site.

### 1.6.1 Site selection saving mangrove and public wetlands:

- Site selection shall not result in destruction of mangrove and/or public wetlands.
- Site selection for a marine hatchery shall be done in an environmentally suitable location.
- Hatchery site shall be outside of any mangrove area or wetland or environmentally sensitive area.
- Hatchery construction and operations shall not result in any loss of mangroves or wetlands or affect sensitive coastal ecosystems or sanctuaries.
- The site must permit easy transportation of hatchery inputs and outputs.
- The site must have easy access to clean sea water of good quality and clean fresh water of good quality.
- Operation of a marine shrimp hatchery shall not interfere with the natural environment and other normal activities of the location, including access to traditional fishing or gathering grounds for local inhabitants.
- Hatchery operation shall not pollute the environment.
- Hatchery must have facilities for waste water disposal in an environmentally acceptable way.

## 1.7 BROODSTOCK MANAGEMENT

Note: While other countries in Southeast Asia and the Indian sub-continent have allowed the importation of non-native Specific Pathogen Free (SPF) stocks, specifically *Litopenaeus vannamei*, Bangladesh remains a major producer of the indigenous species, *Penaeus monodon*, and relies on the capture of mature females for PL production. Several countries as well as private companies are developing, or attempting to develop, domesticated lines of SPF *Penaeus monodon*. The progress of these efforts should be monitored by Bangladesh authorities and commercial operators. SPF *monodon* may offer advantages over locally sourced wild broodstock at some point in the future.

### 1.7.1 Broodstock Origin:

- Hatcheries shall use only local species collected from the local environment and shall not import any shrimp or use any non-native species without documented approval from the authorities competent within this field (the “Competent Authority,” or “Competent Authorities”) and observance of the national quarantine rules for importation of live animals, which would include the reporting of suspected outbreaks of any diseases transmissible to humans through food to the Competent Authorities.
- Hatchery animals shall be adequately contained and their escape to the open water environment shall be adequately protected.
- Hatchery shall use only mature brood shrimp collected from outside the 40 m exclusion zone with specially designed and equipped brood shrimp collection crafts. Broodstock shall not be collected with commercial trawlers.

**1.7.2 Broodstock Health:**

- Hatchery shall test all brood stocks for viruses, pathogens and contaminants and preserve records on all tests conducted.
- Hatchery shall establish a documented shrimp health monitoring plan and control procedures, including those relating to brood shrimp and pests to minimize the risk of disease or contamination.
- Hatchery shall establish health monitoring and control procedures through regular sanitary inspections to eliminate the risk of the following:
  - microbiological hazards (e.g. salmonella);
  - contaminants (e.g., metals, dioxins, PCBs); and
  - diseases, particularly the following: taura syndrome, yellow head disease and white spot disease.
- Hatchery shall not use any unchecked or PCR-positive, that is, virus-infected, or otherwise diseased brood shrimp for hatchery use, and shall not use brood shrimps exceeding the permitted levels of microbiological hazards or contaminants.
- Hatchery shall properly dispose of infected or dead shrimp, either by burning or burying in safe distance from the hatchery.

**1.8 SAFE DISCHARGE OF LIQUID AND SOLID WASTE:**

**1.8.1** Hatchery shall monitor effluent at least bi-monthly to confirm that the hatchery effluent meets the following standards.

<b>Parameter</b>	<b>Units</b>	<b>Standard</b>
pH	Standard pH units	6.0 – 9.0
Total suspended solids (TSS)	mg/L	Not more than 50
Soluble phosphorus	mg/L	0.1 or less
Total ammonia nitrogen (TAN)	mg/L	3.0 or less
5-day biochemical oxygen demand (BOD <sub>5</sub> )	mg/L	30 or less
Dissolved oxygen (DO)	mg/L	5 or more

**1.8.2 Biochemical oxygen demand or BOD** is a chemical procedure for determining the amount of dissolved oxygen needed by aerobic organisms in a body of water to break down organic material present in a given water sample

at certain temperature over a specific time period. It is not a precise quantitative test, although it is widely used as an indication of the organic quality of water. It is most commonly expressed in milligrams of oxygen consumed per litre of sample during 5 days of incubation at 20°C.

- Hatchery shall treat the waste water before discharging it into any open water system to assure that the BOD of the discharged water meets the above criteria and is not in excess of that of the open water.
- Discharged water shall not contain residues of any unapproved chemicals.
- Hatchery shall store and handle waste and hazardous substances so as to prevent contamination.
- Human waste/sewage shall be disposed of safely to prevent contamination of the hatchery environment

### **1.9 Storage and Disposal of Hatchery Supplies:**

- Fuel, lubricants, and agricultural chemicals shall be stored and disposed of in a safe and responsible manner.
- Fuel and other combustible materials storage areas shall be marked with appropriate warning signs.
- Paper and plastic refuse shall be disposed of in a sanitary and responsible way.
- All chemicals shall be properly labeled including information on chemical composition, potential safety hazards and expiration date.
- Fuels, lubricants and chemicals should not be stored in or near living quarters, kitchen and dining areas or harvest equipment storage areas.
- Hatcheries shall take precautions to avoid spills or explosions.
- Measures shall be taken to exclude pests.
- Garbage and other solid waste, including hatchery packing materials, shall be properly disposed of, either by removal or burning or composting in an environmentally acceptable manner.

### **1.10 FOOD SAFETY**

All precautions must be taken so that the shrimp will remain safe for human consumption at all stages. The list of measures listed below is intended to ensure compliance with overarching food safety requirements.

#### **1.10.1 Drug and Chemical Management:**

- Only nationally and internationally approved Aquaculture Medicinal Products (AMPs), other pharmacologically active substances, chemicals and growth hormones should be used at their approved doses
- Nationally and internationally banned drugs including antibiotics and other Veterinary Medicinal Products (VMPs), pharmacologically active substances, growth hormones and dyes should not be used. Of particular interests for hatchery are chloramphenicol, metabolites of nitrofurans (SEM, AHD, AOZ and AMOZ) and dyes (Crystal Violet, Leuco-crystal Violet, Malachite Green and Leuco-malachite green). These drugs and chemicals are banned in all countries.
- Chemicals or drugs which are not banned but restricted due to their health hazard potentials, either in Bangladesh or the country of export, shall be

avoided, or shall be used only to the extent permitted by the restrictions in place in Bangladesh and the country of export (such as EU maximum residue limits on certain substances).

- Prescribed withdrawal period for any drug or pharmacologically active substances shall be followed.
- Approved therapeutic agents shall be used and stored as directed on product labels
- Feed to be used at hatchery either for brood shrimp or for larval stages shall be free from drugs and pharmacologically active substances that are prohibited – nationally and internationally. The feed shall also not contain any approved drugs and chemicals in excess of their permissible levels.
- Hatchery shall only use nationally and internationally approved additives, preservatives and growth promoters
- Therapeutic agents that are manufactured and prescribed for disease control shall not be used for general prophylactic or preventive purposes.
- For products intended for export into the U.S.A, feed shall not contain ingredients, food additives, or colorants that are not approved by FDA or “generally recognized as safe” (GRAS)
- Hatcheries shall maintain a traceable record-keeping system that will document procurement and usages of drugs, chemicals and other therapeutic agents

## **1.11 SELLING AND TRANSPORTATION OF PL**

### **1.11.1 Minimum age for sale of PL:**

- Hatchery shall not sell PL younger than PL-10 to farmers.

### **1.11.2 Techniques to be used:**

- Hatchery shall transport PL only under conditions that do not alter their health status.
- Hatchery shall sell PL only in polyethylene bags supplied with adequate oxygen.
- Hatchery shall use insulated carrier and ice for long distance transportation of the PL to maintain a relatively low and stabilized (20 – 22°C) temperature of the water containing the PL.
- Hatchery shall adjust (acclimate) the PL close to the salinity of the farming areas.
- Hatchery shall ensure that the water used in the oxygen bag is free from nationally and internationally prohibited chemicals.
- Hatchery must state on PL bags: (i) Age of the PL in days, (ii) Adjusted salinity level (P. monodon), (iii) Declaration that the PL are not infected with WSSV or YHV and free from prohibited antibiotics and other prohibited chemicals.

## **1.12 BIOSECURITY**

Since most disease outbreaks can be traced to the importation of infected stocks or the use of unscreened wild (ocean-caught) stocks, it is imperative that hatcheries implement robust

biosecurity measures to prevent inadvertent contamination of the facility. These measures shall address personnel as well as broodstock and PL items.

- 1.12.1 The hatchery premises shall be well protected from unauthorized access of outsiders and any access of wild or domestic animals shall be prohibited.
- 1.12.2 Dead shrimp or PL shall be burned or responsibly buried.
- 1.12.3 Hatchery discharge water must be treated to eliminate potential disease organisms.
- 1.12.4 Visitors shall register at hatchery office.
- 1.12.5 All vessels or tanks used to transport PL shall be thoroughly cleaned and disinfected prior to re-use for PL shipment.
- 1.12.6 Workers shall be trained on the importance of hatchery biosecurity.
- 1.12.7 Hatchery owners are to ensure that PL are protected against comination.
- 1.12.8 Equipments, containers, crates, etc that have been used in infected tanks, must be cleaned and disinfected properly before reuse.
- 1.12.9 Good Hygiene Practices (GHPs) should be implemented in all sections of the hatchery. All equipment, containers, crates, etc. shall be kept cleaned and disinfected where applicable
- 1.12.10 High degree of personal hygiene of the operators and workers should be ensured
- 1.12.11 Hatchery must take account of the results of any relevant analyses carried out on samples taken from shrimp or other samples that have importance to human health.
- 1.12.12 Hatchery must take appropriate remedial action when informed of problems identified during official controls.

### **1.13 TRACEABILITY RECORDS**

***[Traceability is a system by which shrimp (or any other food products) and any inputs that may have been incorporated into the shrimp can be traced from its origin to the consumer level. In order to accomplish this, all links in the supply chain must keep sufficiently detailed records, as summarized below.]***

- 1.13.1 Hatchery shall systematically records sources (geographical areas) for all suppliers and dates of broodstocks received.
- 1.13.2 Hatchery shall maintain records of all drugs and chemicals used, including source data, reasons for use, product traceability codes (for example, product lot numbers), and dates and dosages of application and withdrawal periods.
- 1.13.3 Hatchery shall maintain records of the nature and sources of feeds, dates and quantities used.

- 1.13.4** Hatchery shall maintain records of the buyers' names and addresses along with dates, PL number and lot number of the PL sold to each buyer.
- 1.13.5** Hatchery shall maintain records on the occurrence of diseases that may affect the safety of shrimp products.
- 1.13.6** Hatchery shall maintain records on the results of any analyses carried out on samples taken from brood shrimp or other samples taken for diagnostic purposes that have importance for human health.
- 1.13.7** Hatchery shall maintain records any relevant reports on checks carried out on brood shrimp.
- 1.13.8** Record keeping should be done as per the format to be given by the Competent Authority.

## **2. GALDA SHRIMP (*MACROBRACHIUM*) HATCHERY**

### **2.1 LEGAL OWNERSHIP AND RIGHT TO THE USE OF THE HATCHERY LAND AND INFRASTRUCTURE**

Human rights, including resources rights of local populations should be respected in accordance with all relevant national laws and international treaties. In particular, agricultural lands to be converted to shrimp aquaculture should not be acquired by coercion. The terms of all leases should be respected. The rights of local communities particularly those involved in subsistence and small scale fishing and agriculture to a secure and just livelihood must be respected.

- 2.1.1** Hatchery operator must have a legal document indicating that he has the legal right to use the hatchery either as an owner or as a leaseholder.
- 2.1.2** In case the hatchery operator is a leaseholder, he must have (a) a current lease document with clearly spelt out conditions and signed both by the lease holder and the hatchery owner and (b) a lease money clearance certificate from the hatchery owner.
- 2.1.3** Both hatchery owner and lessee must have a copy of the lease document with details of lease conditions and signed by each party and at least one witness for each party.

### **2.2 REGISTRATION WITH AND LICENSE FROM AN APPROPRIATE ORGANIZATION**

- 2.2.1** Hatchery must be registered with, and approved by, the Department of Fisheries or any Government of Bangladesh (GOB) authorized organization.
- 2.2.2** License to the hatchery may only be issued, or renewed, provided the hatchery complies with applicable regulations on food safety, hygiene standards, social responsibilities, environmental sustainability, food safety and local development plans.

### **2.3 HARMONY WITH THE COMMUNITY**

- 2.3.1** Hatchery shall work in harmony with the local community.
- 2.3.2** Hatchery shall not create any obstacles for the local communities to access the public mangrove areas, fishing grounds or other public resources.
- 2.3.3** Hatchery sea water intake and outlet pipes, wells or other structures shall not cause erosion or other physical damage to the shoreline or beachfront where they are located.
- 2.3.4** Hatchery shall not interfere with other normal activities of the local community.

### **2.4 LABOUR STANDARD COMPLIANCE**

- 2.4.1 Hatchery shall comply with National Labour Law applicable to hatcheries.
- 2.4.2 Hatchery shall compensate all workers according to applicable national regulation. Payroll and/or compensation records shall be maintained for all employees and shall be available for inspection.
- 2.4.3 Hatchery shall not employ child labour.
- 2.4.4 There shall be no discrimination, abuse, or harassment based on gender, age, or religion in employment, including hiring, salary benefits, advancement, discipline, termination or retirement.
- 2.4.5 Workers who take maternity leave must not face dismissal nor the threat of dismissal, loss of seniority or deduction of wages and must be able to return to their former employer at the same rates of pay and benefits.
- 2.4.6 There must not be any use of bonded or forced labour.
- 2.4.7 Facility owners and employees shall respect the religious, cultural, and traditional beliefs and practices of the local community.

## **2.5 WORKERS' HEALTH AND HYGIENE ISSUES**

Working conditions (and employee conditions, where applicable) shall be safe and healthy for all workers in accordance with national laws and regulations and International Organization standards. Employers must conduct risk assessments to identify hazards and any risk to the health and safety of the employees, take reasonable steps to eliminate or control these risks, and inform, educate, and protect the employees from these risks.

- 2.5.1 Workers handling brood-stocks and PL shall have a valid and current medical certificate that verifies that they are not suffering from any contagious or communicable disease.
- 2.5.2 A person with a contagious or communicable disease shall not be permitted access into the hatchery.
- 2.5.3 Workers shall be instructed and/or trained in animal health as relates to the hatchery, and food, personal hygiene, and sanitation matters related to their work activities. All training shall be properly documented, as follows:
  - Training location, date and subject material
  - Name and qualifications of Trainer
  - Names and responsibilities of attendees
- 2.5.4 Workers shall be provided with adequate training in the application of the HACCP principles and good hygiene practices.
- 2.5.5 Workers shall wear neat, tidy, and sanitary clothing while working in the hatchery.
- 2.5.6 Hatchery shall have an adequate number of flush lavatories (toilets) and the lavatories must not open directly into the working areas.

- 2.5.7 Hatchery shall have an adequate number of wash basins with hand cleaning agents.
- 2.5.8 Hatchery shall have disinfecting foot baths at the entry of the hatchery.
- 2.5.9 Cleaning and disinfecting agents shall only contain chemicals that are approved by national and international government agencies for such approved uses.

## **2.6 ENVIRONMENTAL PROTECTION AND SUSTAINABILITY**

The industry will promote responsible and sustainable management practices to ensure the preservation and enhancement of the natural environment. Facilities shall not damage or alter the conditions of coastal wetlands, mangroves, or seagrass beds or other ecological communities near the production site.

### **2.6.1 Site selection saving mangrove and public wetlands:**

- Site selection shall not result in destruction of mangrove and/or public wetlands.
- Site selection for a *Macrobrachium* or Galda shrimp hatchery must be at an environmentally suitable location.
- Hatchery site shall be outside any mangrove area or wetland or environmentally sensitive area
- Hatchery construction and operations shall not result in any loss of mangroves or wetlands or affect sensitive coastal ecosystems or sanctuaries
- The site must permit easy transportation of hatchery inputs and outputs
- The site must have easy access to clean sea water of good quality and clean fresh water of good quality
- Operation of a marine shrimp hatchery shall not interfere with the natural environment and other normal activities of the location, including access to traditional fishing or gathering grounds for local inhabitants
- Hatchery operation shall not pollute the environment
- Hatchery must have facilities for waste water disposal in an environmentally acceptable way

## **2.7 BROODSTOCK MANAGEMENT**

### **2.7.1 Broodstock Origin:**

- Hatchery shall use only local species collected from the local environment and shall not import any shrimp or use any non-native species without documented approval from the Competent Authorities and observing the national quarantine rules for importation of live animals, which would include the reporting of suspected outbreaks of any diseases transmissible to humans through food to the Competent Authorities
- Hatchery animals shall be adequately contained and their escape to the open water environment shall be adequately protected.

- Hatchery shall use only mature brood shrimp collected from outside the 40 m zone with specially designed and equipped brood shrimp collection crafts. Broodstock shall not be collected with commercial trawlers.

**2.7.2 Broodstock Health:**

- Hatchery shall test all brood stocks for viruses, pathogens and contaminants and preserve records on all tests conducted.
- Hatchery shall establish a documented shrimp health monitoring plan and control procedures, including those relating to brood shrimp and pests to minimize the risk of disease or contamination.
- Hatchery shall establish health monitoring and control procedures through regular sanitary inspections to eliminate the risk of microbiological hazards
  - microbiological hazards (e.g., salmonella);
  - contaminants (e.g., metals, dioxins, PCBs); and
  - diseases, particularly the following: taura syndrome, yellow head disease and white spot disease.
- Hatchery shall not use any unchecked or PCR-positive, that is, virus-infected, or otherwise diseased brood shrimp for hatchery use and shall not use brood shrimp exceeding the permitted levels of microbiological hazards or contaminants.
- Hatchery shall properly dispose of infected or dead shrimp, either by burning or burying in safe distance from the hatchery.

**2.8 SAFE DISCHARGE OF LIQUID AND SOLID WASTE:**

Hatchery shall monitor effluent at least bi-monthly to confirm that the hatchery effluent water meets the following standards.

<b>Parameter</b>	<b>Units</b>	<b>Standard</b>
pH	Standard pH units	6.0 – 9.0
Total suspended solids (TSS)	mg/L	Not more than 50
Soluble phosphorus	mg/L	0.3 or less
Total ammonia nitrogen (TAN)	mg/L	3.0 or less
5-day biochemical oxygen demand (BOD <sub>5</sub> )	mg/L	30 or less
Dissolved oxygen (DO)	mg/L	5 or more

**Biochemical oxygen demand or BOD** is a chemical procedure for determining the amount of dissolved oxygen needed by aerobic organisms in a body of water to break down organic material present in a given water sample at certain temperature over a specific time period. It is not a precise quantitative test, although it is widely used as an indication of the organic quality of water. It is most commonly expressed in milligrams of oxygen consumed per litre of sample during 5 days of incubation at 20 °C.

- Hatchery shall treat the waste water before discharging it into any open water system to assure that the BOD of the discharged water meets the above criteria and is not in excess of that of the open water.

- Discharged water shall not contain residues of any uncertified chemicals.
- Hatchery shall store and handle waste and hazardous substances so as to prevent contamination.
- Human waste/sewage shall be disposed of safely to prevent contamination of the hatchery environment.

### **2.8.1 Storage and Disposal of Hatchery Supplies:**

- Fuel, lubricants, and agricultural chemicals shall be stored and disposed of in a safe and responsible manner.
- Fuel and combustible materials storage areas shall be marked with appropriate warning signs.
- Paper and plastic refuse shall be disposed of in a sanitary and responsible way.
- All chemicals shall be properly labeled including information on chemical composition, potential safety hazards and expiration date.
- Fuels, lubricants and chemicals should not be stored in or near living quarters, kitchen and dining areas or harvest equipment storage areas.
- Hatcheries shall take precautions to avoid spills or explosions.
- Measures shall be taken to exclude pests.
- Garbage and other solid waste including hatchery packing materials shall be properly disposed of; either by removal or burning or composting in an environmentally acceptable manner.

## **2.9 FOOD SAFETY**

All precautions must be taken so that the shrimp will remain safe for human consumption at all stages. The list of measures listed below is intended to ensure compliance with overarching food safety requirements.

### **2.9.1 Drug and Chemical Management:**

- Only nationally and internationally approved Aquaculture Medicinal Products (AMPs), other pharmacologically active substances, chemicals and growth hormones should be used at their approved doses
- Nationally and internationally banned drugs including antibiotics and other Veterinary Medicinal Products (VMPs), pharmacologically active substances, growth hormones and dyes should not be used. Of particular interests for hatchery are chloramphenicol, metabolites of nitrofurans (SEM, AHD, AOZ and AMOZ) and dyes (Crystal Violet, Leuco-crystal Violet, Malachite Green and Leuco-malachite green). These drugs and chemicals are banned in all countries.
- Chemicals or drugs which are not banned but restricted due to their health hazard potentials, either in Bangladesh or the country of export, shall be avoided, or shall be used only to the extent permitted by the restrictions in place in Bangladesh and the country of export (such as EU maximum residue limits on certain substances).
- Prescribed withdrawal period for any drug or pharmacologically active substances shall be followed.
- Approved therapeutic agents shall be used and stored as directed on product labels.

- Feed to be used at the hatchery either for brood shrimp or for larval stages shall be free from drugs and pharmacologically active substances that are prohibited – nationally and internationally. The feed shall also not contain any approved drugs and chemicals in excess of their permissible levels.
- Hatchery shall only use nationally and internationally approved additives, preservatives and growth promoters
- Therapeutic agents that are manufactured and prescribed for disease control shall not be used for general prophylactic or preventive purposes.
- For products intended for export into the U.S., feed shall not contain ingredients, food additives, or colorant additives that are not approved by FDA or “generally recognized as safe” (GRAS).
- Hatcheries shall maintain a traceable record-keeping system that will document procurement and usages of drugs, chemicals and other therapeutic agents

## **2.10 SELLING AND TRANSPORTATION OF PL**

**2.10.1** Hatchery shall not sell PL younger than PL-10 to farmers.

### **2.10.2 Transportation techniques:**

- Hatchery shall transport PL only under conditions that do not alter their health status.
- Hatchery shall sell PL only in polyethylene bags supplied with adequate oxygen.
- Hatchery shall use insulated carrier and ice for long distance transportation of the PL to maintain a relatively low and stabilized (20 – 22°C) temperature of the water containing the PL.
- Hatchery shall ensure that the water used in the oxygen bag is free from nationally and internationally prohibited chemicals.
- Hatchery must state on PL bags: (i) Age of the PL in days, (ii) Declaration that the PL are not infected with WSSV or YHV and free from prohibited antibiotics and other prohibited chemicals.

## **2.11 BIOSECURITY**

Since most disease outbreaks can be traced to the importation of infected stocks or the use of unscreened stocks, it is imperative that hatcheries implement robust biosecurity measures to prevent inadvertent contamination of the facility. These measures shall address personnel as well as broodstock and PL items.

**2.11.1** The hatchery premises shall be well protected from unauthorized access of outsiders and any access of wild or domestic animals shall be prohibited.

**2.11.2** Hatchery, including any and all equipment, containers and crates used therein, shall be kept clean and, where necessary after cleaning, disinfected.

**2.11.3** Hatchery must take account of the results of any relevant analyses carried out on samples taken from shrimp or other samples that have importance to human health.

- 2.11.4 Hatchery must take appropriate remedial action when informed of problems identified during official controls.
- 2.11.5 Dead shrimp or PL shall be burned or responsibly buried.
- 2.11.6 Hatchery discharge water must be treated to eliminate potential disease organisms.
- 2.11.7 Visitors shall register at hatchery office.
- 2.11.8 All vessels or tanks used to transport PL shall be thoroughly cleaned and disinfected prior to re-use for PL shipment.
- 2.11.9 Workers shall be trained in the importance of hatchery biosecurity.
- 2.11.10 Hatchery owners are to ensure that PL are protected against contamination.
- 2.11.11 Equipments, containers, crates, etc that have been used in infected tanks, must be cleaned and disinfected properly before reuse.
- 2.11.12 Good Hygiene Practices (GHPs) should be implemented in all sections of the hatchery. All equipment, containers, crates, etc. shall be kept cleaned and disinfected where applicable
- 2.11.13 High degree of personal hygiene of the operators and workers should be ensured

## **2.12 TRACEABILITY RECORDS**

***[Traceability is a system by which shrimp (or any other food products) and any inputs that may have been incorporated into the shrimp can be traced from its origin to the consumer level. In order to accomplish this, all links in the supply chain must keep sufficiently detailed records, as summarized below.]***

- 2.12.1 Hatchery shall systematically record sources (geographical areas) for all suppliers and dates of brood- stocks received.
- 2.12.2 Hatchery shall maintain records of all drugs and chemicals used, including source data, reasons for use, product traceability codes (for example, lot numbers), and dates and dosages of application and withdrawal periods.
- 2.12.3 Hatchery shall maintain records of the nature and sources of feeds, dates and quantities used.
- 2.12.4 Hatchery shall maintain records of:
  - Buyers' names and addresses along with dates
  - PL number and lot number of the PL sold to each buyer

- 2.12.5** Hatchery shall maintain records on the occurrence of diseases that may affect the safety of shrimp products.
- 2.12.6** Hatchery shall maintain records on the results of any analyses carried out on samples taken from brood shrimp or other samples taken for diagnostic purposes that have importance for human health.
- 2.12.7** Hatchery shall maintain records any relevant reports on checks carried out on brood shrimp.
- 2.12.8** Record keeping should be done as per the format to be given by the Competent Authority.

### **3. BLACK TIGER OR BAGDA SHRIMP (*PENAEUS MONODON*) FARM**

Shrimp productivity depends to a large extent on good animal husbandry. Production efficiencies can often be increased with little additional cost, either in monetary or environmental terms. For instance, overstocking and stocking PL directly to the grow-out pond without any acclimatization, predator control or nursing can cause high mortalities. Water management is critical to coastal shrimp aquaculture.

Disease can cause heavy losses and can be difficult to control and isolate when disease management is lacking, when traceability of PL supplies is limited and when the design of water supply/flushing structures is poor. Poor pond water quality management also leads to higher levels of animal stress and disease-related mortality. The following management practices are recommended to improve productivity, reduce the risk of disease, and reduce the potential for conflicts over land and water use.

#### **3.1 LEGAL OWNERSHIP OR RIGHT TO THE USE OF THE FARM LAND AND INFRASTRUCTURE**

- 3.1.1** Farm operator must have legal documentation that proves he has the legal rights to use the farm either as an owner or as a leaseholder.
- 3.1.2** If the farm operator is a leaseholder, he will have to have (a) a lease document with clearly spelt out conditions and signed both by the lease holder and the farm owner and (b) a lease money clearance certificate from the farm owner.
- 3.1.3** Both farm owner and lessee must have a copy of the lease document with details of lease conditions and signed by each party and with at least one witness for each party.

#### **3.2 REGISTRATION WITH AND LICENSE FROM AN APPROPRIATE ORGANIZATION**

- 3.2.1** Farm must be registered with and licensed by the Department of Fisheries or any organization authorized by the Government of Bangladesh
- 3.2.2** The farms will get license if they are in compliance with the existing regulations, standards, codes and good practices applicable for the establishment and operation of the farms.

#### **3.3 COMMUNITY HARMONY**

- 3.3.1** Farms shall work in harmony with the local community.
- 3.3.2** Farms shall not create any obstacles for the local communities to access the public mangrove areas, fishing grounds or other public resources.
- 3.3.3** Sea water intake and outlet pipes, wells or other structure of the farm shall not cause erosion or other physical damage to the shoreline or beachfront where they are located.
- 3.3.4** Farm shall not interfere with other normal activities of the local community.

### **3.4 LABOUR STANDARD COMPLIANCE**

- 3.4.1** Farm shall comply with the National Labour Law for the farming sector.
- 3.4.2** Farm shall compensate all workers according to applicable national regulation. Payroll and/or compensation records shall be maintained for all employees and be available for inspection.
- 3.4.3** Farm shall not employ child labour.
- 3.4.4** There shall be no discrimination, abuse, or harassment based on gender, age, or religion in employment, including hiring, salary benefits, advancement, discipline, termination or retirement.
- 3.4.5** Workers who take maternity leave must not face dismissal nor threat of dismissal, loss of seniority or deduction of wages and must be able to return to their former employer at the same rates of pay and benefits.
- 3.4.6** There must not be any use of bonded or forced labour.
- 3.4.7** Facility owners and employees shall respect the religious, cultural, and traditional beliefs and practices of the local community.

### **3.5 WORKERS' HEALTH AND HYGIENE ISSUES**

Working conditions (and employee living conditions, where applicable) shall be safe and healthy for all workers in accordance with national laws and regulations and International Organisation standards. Employers must conduct risk assessments to identify hazards and any risk to the health and safety of the employees, take reasonable steps to eliminate or control these risks, and inform, educate, and protect the employees from these risks.

- 3.5.1** Workers handling shrimp products shall have a valid and current medical certificate that verifies that they are not suffering from any contagious or communicable disease.
- 3.5.2** No one with any contagious disease or wounds in hands should be allowed to handle shrimp.
- 3.5.3** A person with a contagious or communicable disease shall not be permitted access into the farm.
- 3.5.4** Workers shall be instructed and/or trained in animal health as relates to the shrimp farm, and food, personal hygiene, and sanitation matters related to their work activities. All training shall be properly documented, as follows:
  - Training location, date and subject material
  - Name and qualifications of trainer
  - Names and responsibilities of attendees
- 3.5.5** Workers shall be provided with adequate training on Good Aquaculture Practices, Good Hygiene Practices and application of HACCP principles in the farm

- 3.5.6 Workers shall wear clean clothing while working at the farm.
- 3.5.7 Farm shall have an adequate number of sanitary toilets and the toilets must be well separated from the farming area and it must be well protected from any kind of seepage.
- 3.5.8 Farm shall have an adequate number of wash basins with hand cleaning and disinfecting agents.
- 3.5.9 Cleaning and disinfecting agents shall only contain chemicals that are approved by national and international government agencies for such approved uses.

### 3.6 ENVIRONMENTAL PROTECTION AND SUSTAINABILITY

The shrimp farming industry will promote responsible and sustainable management practices to ensure the preservation and enhancement of the natural environment. Facilities shall not damage or alter the conditions of coastal wetlands, mangroves, or sea-grass beds or other ecological communities near the production site.

#### 3.6.1 Site Selection and Saving Mangroves:

- Any new farm shall be located outside the mangrove area and shall not cause any damage to neighboring mangrove cover.
- Mangroves shall not be removed for the construction of ponds, canals, or any other purpose.
- Any existing farm in a mangrove area shall plant mangrove plants on the strip of land, if existing and available to him, in between the adjacent river and the riverward dike of the farm.
- Farm shall not occupy any part of common property wetland or obstruct or interfere with the flowing canal.
- Site selection shall not result in destruction of mangrove and/or public wetlands.
- Shrimp farm should be built in an environmentally suitable location and out of the flood prone area.
- The farm site shall be outside of any mangrove area or wetland or environmentally sensitive area.
- Farm construction and operations shall not result in any loss of mangroves or wetlands or affect sensitive coastal ecosystems or sanctuaries.
- The site must permit easy transportation of farm inputs and outputs.
- The site must have easy access to good quality sea or brackish water, suitable for the culture of *Penaeus monodon*.
- Operation of a shrimp farm shall not interfere with the natural environment and other normal activities of the location, including access to traditional fishing or gathering grounds for local inhabitants.
- Farm operations shall not pollute the environment.
- Farm must dispose of waste water in an environmentally acceptable way.

#### 3.6.2 Farm Design, Construction and Operation:

- Design and construction of the farm dikes, intake or drainage canals or the sluice should be fit for the purpose.
- Gates shall not result in loss of any mangrove or erosion of river banks or neighboring land.
- Farm design, construction, or operation shall not obstruct or change the flow of any neighboring canal.
- Pond construction shall not expose any acid-sulfate soil.
- Farm design, construction, or operation shall not cause soil erosion.
- Water from one pond shall not have access to another pond
- Pond's effective depth will be 1.0 – 1.5 meters.
- Pond should have sufficient freeboard (height above pond operation level) to avoid overtopping during severe rains or floods.

**3.6.3 Soil/Water Conservation:**

- Pond will use only surface water, no underground (bore) water.
- Farm construction and operations shall not allow any saline water to seep into neighboring agricultural land or cause salinization of underground water supplies (aquifers).

**3.6.4 PL Source:**

- For the sake of environmental sustainability, farmers shall not use PL from wild sources as this reduces natural bio-diversity and compromises traceability, but shall use PL from a certified hatchery.
- Farmer shall use only PCR-negative and disease-free healthy hatchery PL.
- Farm shall comply with government regulations regarding the importation of native and exotic shrimp seed stocks.

**3.6.5 Water Quality and Effluent Management:**

- Farms shall monitor effluent water at least bi-monthly to confirm the following required water quality parameters:

Parameter	Units	Standard
pH	Standard pH units	6.0 – 9.0
Total suspended solids (TSS)	mg/L	Not more than 50
Soluble phosphorus	mg/L	0.1 or less
Total ammonia nitrogen (TAN)	mg/L	3.0 or less
5-day biochemical oxygen demand (BOD <sub>5</sub> )	mg/L	30.0 or less
Dissolved oxygen (DO)	mg/L	5.0 or more

- Farms shall treat the effluent water before discharging it into any open water system to assure that the BOD of the discharged water is not in excess of that of the open water.

- Water samples should be collected at a point where the effluent leaves the farm property. For farms with multiple effluent points a composite sample shall be collected.

### **3.6.6 Biosecurity:**

- Water exchange should be managed carefully and kept to a minimum when possible:
  - In order to not impact the environment with excess effluents.
  - To avoid introduction of potential disease carrying vectors (crabs, other shrimp species, etc.)
- Shrimp ponds should have separate screened inlets and outlets and water should be carefully filtered to keep competitors, predators, and disease carrying organisms out.
- A fine mesh fence, at least two feet high and buried six inches into the ground, can be built around the perimeter of the shrimp farm to keep out virus carrying crabs and other small animal pests.
- Gates and barriers should be constructed to keep dogs and farm animals out.
- Visitors shall register at farm office.
- All vessels used to transport PL shall be thoroughly cleaned and disinfected prior to re-use for PL shipment.
- Workers shall be trained on the importance of farm biosecurity.
- Farm owners are to ensure that shrimp are protected against contamination.
- Equipments, containers, crates, etc that have been used in infected tanks, must be cleaned and disinfected properly before reuse.
- Good Hygiene Practices(GHPs) should be implemented in all sections of the farm. All equipment, containers, crates, etc. shall be kept cleaned and disinfected where applicable.
- Farm shall take an account of the results of any relevant analyses carried out on samples taken from shrimp or other samples that have importance to human health.
- Farm shall take appropriate remedial action when informed of problems identified during official controls.

### **3.6.7 Sediment Management:**

Farms shall manage its sediment resulted from pond bottom, canals and settling basins within the farm but not throw them away into open water or others' land, causing ecological or social problems.

### **3.6.8 Fisheries Resources Conservation:**

The conservation of marine fisheries resources (fish meal and fish oil) is a growing concern for the entire aquaculture community. All shrimp and fish farmers should be aware of the amounts and sources of the formulated feeds offered to their products.

- Feed Conversion Ratio (FCR): Farms should record the FCR for each harvest according to the following formula:
- $FCR = \text{Total Amount of Feed Fed} \div \text{Total Amount of Shrimp Produced}$

### **3.7 STORAGE AND DISPOSAL OF FARM SUPPLIES**

Farms use fuel to power aerators, tractors and other farm vehicles. Farms likewise use agricultural chemicals for fertilizer and cleaning and disinfection. Improper storage of these materials presents a potential environmental and worker safety issue. Food safety can also be compromised if these materials are stored in such a way that could lead to cross contamination.

- Fuel, lubricants, and agricultural chemicals shall be stored and disposed of in a safe and responsible manner.
- Paper and plastic refuse shall be disposed of in a sanitary and responsible way.
- All chemicals shall be properly labeled including information on chemical composition, potential safety hazards and expiration date.
- Fuels, lubricants and chemicals should not be stored in or near living quarters, kitchen and dining areas or harvest equipment storage areas.
- Farms shall take precautions to avoid spills or explosions.
- Measures shall be taken to exclude pests.
- Garbage and other solid waste shall be properly disposed of, either by removal or burning or composting in an environmentally acceptable manner.

### **3.8 FOOD SAFETY**

All precautions must be taken so that the shrimp will remain safe for human consumption at all stages. The list of measures listed below is intended to ensure compliance with overarching food safety requirements.

Regular veterinary controls shall be undertaken to ensure compliance with relevant food safety requirements in Bangladesh and the country of export.

#### **3.8.1 Microbial Sanitation:**

- Untreated human sewage (including household waste water) shall not be released from the farm or neighborhood into local ecosystems or the ponds.
- Only fertilizers that are approved nationally and internationally shall be used in ponds. For instance, cow dung, poultry litter and human wastes shall not be used as fertilizers.
- No animals or birds shall be allowed inside the farm premises.
- No run off water likely to carry microbiological hazards, contaminants or disease shall be allowed to enter the ponds (e.g., residue from nearby agriculture or aquaculture or animal husbandry); no equipment likely to carry microbiological hazards, contaminants or disease shall be used.

#### **3.8.2 Drug and Chemical Management:**

- A land having a history of agricultural pesticide contamination, particularly with long life pesticides, shall not be used.
- Agricultural pesticides with residual effects in shrimp shall not be used in the field used for agriculture-aquaculture rotation. Pesticides shall only be used to the extent compatible with regulations in force in Bangladesh and the country of export (such as maximum residue levels in force in the EU).

- Antibiotics, drugs and other chemical compounds that are banned in Bangladesh or the country of export shall not be used any time. Of particular interest are chloramphenicol and the nitrofurans group. These antibiotics are banned in all countries and should never be used under any circumstances.
- Chemicals or drugs which are not banned but restricted due to their health hazard potentials, either in Bangladesh or the country of export, shall be avoided, or shall be used only to the extent permitted by the restrictions in place in Bangladesh and the country of export (such as EU maximum residue limits on certain substances)
- Approved therapeutic or other pharmacologically active substances may be used as directed on product labels for control of diagnosed diseases or required management, not prophylactic or preventive purposes
- Prescribed withdrawal period for any drug shall be followed.
- Farms shall only use nationally and internationally approved additives, preservatives and growth promoters.

### **3.9 FEED AND FEED MANAGEMENT:**

- Feed or feed ingredients to be used at the farm shall be certified by the manufacturers to be free from drugs, including antibiotics or other substances (including artificially formulated growth hormones), that are prohibited nationally and internationally.
- For products intended for export into the U.S., feed shall not contain ingredients, food additives, or color additives that are not approved by FDA or “generally recognized as safe” (GRAS).
- Any uncooked feed ingredients of animal origin (For instance dead animals, snail meat, crab meat, etc.) shall not be used.
- The use of supplemental feeds should be managed and controlled to limit over-feeding, improve the food conversion-ratio, and minimize contamination of the pond and outside-environment feeding frequency.
- Feed that contains shrimp, or crab or any other crustacean shell, shall not be used, these may contain SEM (Semicarbazide, which is a metabolite of nitrofurans)
- Any oversupply of feed shall be strongly discouraged to avoid water pollution, besides wastage of expensive feed.

### **3.10 HARVEST AND TRANSPORT**

#### **3.10.1 Shed and Shrimp Dumping Facilities at Harvesting Points:**

- Farm shall have a clean shed with a raised and smooth cemented or mosaic floor for dumping and sorting shrimp after harvest; if such a platform is not possible, farm shall place shrimp on a thick and clean plastic sheet spread under the shed.
- Farms shall use only food grade plastic baskets for holding shrimp.
- Farm shall not use any bamboo baskets or mats of bamboo, old drums used for other purposes, jute or other plant materials.

#### **3.10.2 Water Supply:**

- Farm shall have adequate supply of clean water for washing shrimp, shrimp handling and transport equipment and all other facilities.
- Farm shall have supply of potable water for the workers.

### **3.10.3 Ice supply:**

- Farm shall have adequate ice storage facilities made of materials that can be effectively cleaned and disinfected regularly.
- Ice shall be procured only from those factories that are licensed by appropriate authorities to have used water free from arsenic or excessive iron or other hazardous substances and of an acceptable microbiological standard.

### **3.10.4 Synchronizing Farm Harvesting and Shrimp Transportation to Depot/Processing Factory at the Earliest to Ensure Freshness of the Shrimp:**

- Farmer and depot or its agents will work together to synchronize harvesting at the farms, supplying adequate ice of good hygienic quality to the farms, transporting of the shrimp in ice to depot and then to factories within the shortest possible time to ensure shrimp freshness and more efficiently utilize the processing facilities.
- The supplier or its agent will organize and supervise shrimp harvest, gather shrimp in the farm side shed, wash the shrimp in clean water and put the shrimp in ice water filled.
- Shrimp shall only be transported under conditions that do not alter their food safety status.
- Farm shall put shrimps in a chill tank immediately after harvest to cool the shrimp uniformly to temperature below 5°C.
- Farm shall put the shrimp in shrimp box with layers of high quality flake or finely crushed block ice in 1:1 ratio.
- The iced shrimp shall be transported in an insulated motor van/carrier vessel to depot as quickly as possible; in the absence of an insulated motor van, a paddle van may be used, but it must have a hood providing adequate shade to the shrimp boxes.

### **3.10.5 Daily Cleaning and Sanitation – Standard Operating Procedure (SOP):**

- Sweep to remove solid wastes and dirt particles.
- Rinse with clean water to remove fine particles of dirt.
- Apply food grade detergent, workout foam with a brush or ‘green pad’ and thoroughly clean shrimp dumping floor or plastic sheet, weighing balance, shrimp boxes, ice crushing box, iced water cooling tank, etc.
- Rinse with clean water.
- Apply sanitizer in the form of 100-200ppm chlorine water to shrimp dumping floor, plastic sheet, shrimp boxes, ice crushing boxes, cooling tank, weighing balance, etc.
- After cleaning and sanitizing, completely dry all parts.
- Keep lavatories clean and disinfected at all times.
- Any person with any contagious disease or wounds in hands shall be prohibited from handling shrimp.

- Farm shall store and handle waste and hazardous substances so as to prevent contamination.

### **3.11 TRACEABILITY RECORDS**

*[Traceability is a system by which shrimp (or any other food products) and any inputs that may have been incorporated into the shrimp can be traced from its origin to the consumer level. In order to accomplish this, all links in the supply chain must keep sufficiently detailed records, as summarised below.]*

- 3.11.1** Farm shall systematically record data in the DoF (Competent Authority) prescribed Record Book
- 3.11.2** Pre-stocking pond preparation data:
  - Date and quantities of lime.
  - Fertilizers or other chemicals used.
- 3.11.3** Record keeping mentioned in this section should be done as per the format to be given by the Competent Authority.
- 3.11.4** Farm shall record supply-water sources and microbiological data.
- 3.11.5** Farm shall maintain records of all drugs and chemicals used, including, source data, reasons for use, product traceability codes (for example, lot numbers), and dates and dosages of application.
- 3.11.6** Farm shall maintain records of the nature and sources of feeds, product traceability codes, to the extent available, and dates and quantities used.
- 3.11.7** Shall maintain records of sources of PL.
- 3.11.8** Shall maintain records of the shrimp buyers' names and addresses along with dates.
- 3.11.9** Farm shall maintain records of:
  - Buyers' names and addresses along with dates
  - Pond or lot number and kilos of Black Tiger or Bagda sold to each buyer.
- 3.11.10** Farm shall maintain records on the occurrence of diseases that may affect the safety of shrimp.
- 3.11.11** Farm shall maintain records on the results of any analyses carried out on samples taken from the pond (soil, water, and shrimp).

## **4. GALDA SHRIMP (*MACROBRACHIUM*) FARMS**

### **4.1 LEGAL OWNERSHIP OR RIGHT TO THE USE OF THE FARM LAND AND INFRASTRUCTURE**

- 4.1.1** Farm operator must have legal documentation that proves he has the legal rights to use the farm either as an owner or as a leaseholder.
- 4.1.2** If the farm operator is a leaseholder, he must have (a) a current lease document with clearly spelt out conditions and signed both by the lease holder and the hatchery owner and (b) a lease money clearance certificate from the land owner
- 4.1.3** Both farm owner and lessee must have a copy of the lease document with details of lease conditions and signed by each party and at least one witness for each party.

### **4.2 REGISTRATION WITH AND LICENSE FROM AN APPROPRIATE ORGANIZATION**

- 4.2.1** Farm must be registered with, and licensed by, the Department of Fisheries or any organization authorized by the Government of Bangladesh.
- 4.2.2** The farms will get license if they are in compliance with the existing regulations, standards, codes and good practices applicable for the establishment and operation of the farms.
- 4.2.3** License to the farm operation may only be issued, or renewed, provided the farm complies with applicable regulations on food safety, hygiene standards, social responsibilities, environmental sustainability, food safety and local development plans.

### **4.3 COMMUNITY HARMONY**

- 4.3.1** Farms shall work in harmony with the local community.
- 4.3.2** Farms shall not create any obstacles for the local communities to access the public mangrove areas, fishing grounds or other public resources.
- 4.3.3** Sea water intake and outlet pipes, wells or other structure of the farm shall not cause erosion or other physical damage to the shoreline or beachfront where they are located.
- 4.3.4** Farm shall not deny local communities access to public mangrove areas, fishing grounds or other public resources.

### **4.4 LABOUR STANDARD COMPLIANCE**

- 4.4.1** Farm shall comply with National Labour Law applicable to farms.

- 4.4.2 Farm shall compensate all workers according to applicable national regulation. Payroll and/or compensation records shall be maintained for all employees and be available for inspection.
- 4.4.3 Farm shall not employ child labour.
- 4.4.4 There shall be no discrimination, abuse, or harassment based on gender, age, or religion in employment, including hiring, salary benefits, advancement, discipline, termination or retirement.
- 4.4.5 Workers who take maternity leave must not face dismissal nor threat of dismissal, loss of seniority or deduction of wages and must be able to return to their former employer at the same rates of pay and benefits.
- 4.4.6 There must not be any use of bonded or forced labour.
- 4.4.7 Facility owners and employees shall respect the religious, cultural, and traditional beliefs and practices of the local community.

#### **4.5 WORKERS' HEALTH AND HYGIENE ISSUES**

Working conditions (and employee living conditions, where applicable) shall be safe and healthy for all workers in accordance with national laws and regulations and International Organisation standards. Employers must conduct risk assessments to identify hazards and any risk to the health and safety of the employees, take reasonable steps to eliminate or control these risks, and inform, educate, and protect the employees from these risks.

- 4.5.1 Workers handling shrimp products shall have a valid and current medical certificate that verifies that they are not suffering from any contagious or communicable disease.
- 4.5.2 A person with a contagious or communicable disease shall not be permitted access into the farm.
- 4.5.3 Workers shall be instructed and/or trained in animal health as relates to the shrimp farm, and food, personal hygiene and sanitation matters related to their work activities. All training shall be properly documented, as follows:
  - Training location, date and subject material
  - Name and qualifications of Trainer
  - Names and responsibilities of attendees
- 4.5.4 Workers shall be provided with adequate on Good Aquaculture Practices, Good Hygiene Practices and application of HACCP principles in the farm.
- 4.5.5 Workers shall wear clean clothing while working at the farm.
- 4.5.6 Farm shall have an adequate number of sanitary toilets and the toilets must be well separated from the farming area and it must be well protected from any kind of seepage.

- 4.5.7 Farm shall have an adequate number of wash basins with hand cleaning agents.

#### 4.6 ENVIRONMENTAL PROTECTION AND SUSTAINABILITY

The *Macrobrachium* farming industry will promote responsible and sustainable management practices to ensure the preservation and enhancement of the natural environment. Facilities shall not damage or alter the conditions of coastal wetlands, mangroves, or sea-grass beds or other ecological communities near the production site.

##### 4.6.1 Site Selection saving mangrove and common property wetland:

Site selection for a shrimp farm shall be done in an environmentally suitable location. Site selection shall not result in destruction of public wetlands. Any new farm shall be located outside the wetland area and shall not cause any damage to neighbouring aquatic resources.

- Wetlands or other ecologically important habitats shall not be removed for the construction of ponds, canals or any other purpose.
- Any new farm shall be outside the mangrove area and shall not cause any destruction to neighboring mangrove cover.
- Any existing farm in a wetland area shall plant native plants on the strip of land, if existing and available to him, in between the adjacent river and the riverward dike of the farm.
- Farm shall not occupy any part of common property wetland or obstruct or interfere with the flowing canal.
- The site must permit easy transportation of farm inputs and outputs.
- Shrimp farm should be built in an environmentally suitable location and out of the flood prone area.
- The site must have easy access to good quality fresh or brackish water, suitable for the culture of *Macrobrachium*.
- Operation of a shrimp farm shall not interfere with the natural environment and other normal activities of the location, including access to traditional fishing or gathering grounds for local inhabitants.
- Farm operations shall not pollute the environment.
- Farm must dispose of waste water in an environmentally acceptable way.

##### 4.6.2 PL source:

- Farmer shall not use PL of wild sources for the sake of environmental sustainability, bio-diversity and traceability, but will use PL from a certified hatchery.
- Farmer shall use pathogen free and healthy hatchery PL.
- Farmers shall not use any PL illegally brought into the country.
- Farm shall comply with governmental regulations regarding the importation of any PL.

##### 4.6.3 Farm Design, construction and operation:

- Design and construction of the farm dikes, intake or drainage canals or the sluice should be fit for the purpose.

- Design and construction of the farm dikes, intake or drainage canals or the sluice gates shall not result in loss of any wetland or erosion of river banks or neighboring land.
- Pond shall not obstruct or change the flow of any neighboring canal or any major natural course of monsoon run-off water.
- Pond dyke shall not allow access of run-off water into the pond.
- Pond construction shall not expose any acid-sulfate soil.
- Pond design, construction, and operation shall not cause soil erosion.
- Water from one pond shall not have access to another pond.
- Pond's effective depth will be 1.0 – 1.5 meters.
- Pond should have sufficient freeboard (height above pond operation level) to avoid overtopping during severe rains or floods.
- Pond, if tide-fed, will have adequate reservoir ponds for sedimentation and water treatment both for incoming water for filling in the grow out pond and as well as for outgoing water for discharge at the end of the culture period
- Pond shall have facilities for draining out any residual water from the pond at the end of culture operation.
- Pond shall not allow any saline water to seep into neighboring agricultural land.
- Pond will not use any underground water for filling the pond.

**4.6.4 Water Quality and Effluent Management:**

- Farm shall monitor effluent water at least bi-monthly to confirm the following required water quality parameters:

<b>Parameter</b>	<b>Units</b>	<b>Standard</b>
pH	Standard pH units	6.0 – 9.0
Total suspended solids (TSS)	mg/L	Not more than 50
Soluble phosphorus	mg/L	0.3 or less
Total ammonia nitrogen (TAN)	mg/L	3.0 or less
5-day biochemical oxygen demand (BOD <sub>5</sub> )	mg/L	30.0 or less
Dissolved oxygen (DO)	mg/L	6 or more

- Farm shall treat the effluent water before discharging it into any open water system to assure that the BOD of the discharged water is not in excess of that of the open water.
- Water samples should be collected at a point where the effluent leaves the farm property. For farms with multiple effluent points a composite sample shall be collected.

**4.6.5 Sediment Management:**

- Farms shall contain sediment from ponds, canals, and settling basins and not throw them into open water or others' land, causing ecological or social problems.

**4.6.6 Soil/Water Conservation:**

The opinion of the Best Aquaculture Practices (BAP) Program is that underground water resources may be used but with careful monitoring to insure that aquifers are not negatively affected.

- Pond will use only surface water and shall not draw underground water for farming purpose.
- Farm construction and operations shall not allow any saline water to seep into neighboring agricultural land or cause salinization of underground water supplies (aquifers).

#### **4.6.7 Biosecurity:**

- Macrobrachium ponds should have separate screened inlets and outlets and water should be carefully filtered to keep competitors, predators, and disease-carrying organisms out.
- Gates and barriers should be constructed to keep dogs and farm animals out.
- Visitors shall register at farm office.
- All vessels used to transport PL shall be thoroughly cleaned and disinfected prior to re-use for PL shipment.
- Workers shall be trained in the importance of farm biosecurity.
- Farm owners are to ensure that shrimp are protected against contamination.
- Equipments, containers, crates, etc that have been used in infected tanks, must be cleaned and disinfected properly before reuse.
- Good Hygiene Practices (GHPs) should be implemented in all sections of the hatchery. All equipment, containers, crates, etc. shall be kept cleaned and disinfected where applicable.
- Farm, including any and all equipment, containers and crates used therein, shall be kept clean and, where necessary after cleaning, disinfected.
- Farm shall take an account of the results of any relevant analyses carried out on samples taken from shrimp or other samples that have importance to human health.
- Farm shall take appropriate remedial action when informed of problems identified during official controls.

#### **◆ Sediment Management:**

Farms shall manage its sediment resulted from pond bottom, canals and settling basins within the farm but not throw them away into open water or others' land, causing ecological or social problems.

#### **4.6.8 Fisheries Resources Conservation:**

The conservation of marine fisheries resources (fish meal and fish oil) is a growing concern for the entire aquaculture community. All shrimp and fish farmers should be aware of the amounts and sources of the formulated feeds offered to their products.

- Feed Conversion Ratio (FCR): Farms should record the FCR for each harvest according to the following formula:
  - $FCR = \frac{\text{Total Amount of Feed Fed (MT)}}{\text{Total Amount of Shrimp Produced (MT)}}$

#### **4.6.9 Storage and Disposal of Farm Supplies:**

Farms use fuel to power aerators, tractors and other farm vehicles. Farms likewise use agricultural chemicals for fertiliser and cleaning and disinfection. Improper storage of these materials presents a potential environmental and worker safety issue. Food safety can also be compromised if these materials are stored in such a way that could lead to cross contamination.

- Fuel, lubricants and agricultural chemicals shall be stored and disposed of in a safe and responsible manner.
- Fuels, lubricants and chemicals should not be stored in or near living quarters, kitchen and dining areas or harvest equipment storage areas.
- Paper and plastic refuse shall be disposed of in a sanitary and responsible way.
- All chemicals shall be properly labeled including information on chemical composition, potential safety hazards and expiration date.
- Farms shall take precautions to avoid spills or explosions.
- Measures shall be taken to exclude pests and other household animals by fence or similar measures.
- Garbage and other solid waste shall be properly disposed of, either by removal or burning or composting in an environmentally acceptable manner.

#### **4.7 FOOD SAFETY**

All precautions must be taken so that the shrimp will remain safe for human consumption at all stages. The list of measures listed below is intended to ensure compliance with overarching food safety requirements.

Regular veterinary controls shall be undertaken to ensure compliance with relevant food safety requirements in Bangladesh and the country of export.

##### **4.7.1 Avoidance of pesticide contamination:**

- A land having a history of agricultural pesticide contamination, particularly with long life pesticides, shall not be used.
- Agricultural pesticides with long residual effect shall not be used in the field used for agriculture-aquaculture rotation.
- Agricultural pesticides with residual effects in shrimp shall not be used in the field used for agriculture-aquaculture rotation. Pesticides shall only be used to the extent compatible with regulations in force in Bangladesh and the country of export (such as maximum residue levels in force in the EU).

##### **4.7.2 Microbial Sanitation:**

- Untreated human sewage (including household waste water) shall not be released from the farm or neighborhood into local ecosystems or the ponds
- Only fertilizers that are approved nationally and internationally shall be used in ponds. For instance, cow dung, poultry litter and human wastes shall not be used as fertilizers. --.
- No animal or bird pets shall be allowed inside the farm premises.

- No run-off water likely to carry microbiological hazards, contaminants or disease shall be allowed to enter the ponds (e.g., residue from nearby agriculture or aquaculture or animal husbandry); no equipment likely to carry microbiological hazards, contaminants or disease shall be used.

#### **4.7.3 Drug and Chemical Management:**

- Only drugs, including antibiotics, or chemicals, including artificially formulated growth hormones, approved on a national or international basis may be used for their approved uses.
- Antibiotics, drugs and other chemical compounds that are banned in Bangladesh and the country of export shall not be used. Of particular interest are chloramphenicol and the nitrofurans group. These antibiotics are banned in all countries and should never be used under any circumstances. The use of Malachite Green and Gentian violet is also prohibited for *Macrobrachium*.
- Chemicals or drugs which are not banned but restricted due to their health hazard potentials, either in Bangladesh or the country of export, shall be avoided, or shall be used only to the extent permitted by the restrictions in place in Bangladesh and the country of export (such as EU maximum residue limits on certain substances)
- Drugs shall not be used for prophylactic or preventive purposes.
- Approved therapeutic or other pharmacologically active substances may be used as directed on product labels for control of diagnosed diseases or required management, not prophylactic or preventive purposes
- The withdrawal period as prescribed by the pharmaceutical company for any curative medicine shall be followed.
- Feed to be used at hatchery either for brood shrimp or for larval stages shall be free from drugs that are prohibited – whether in Bangladesh or the country of exportation – or excessive levels of other hazardous chemicals (procuring safe feed is the responsibility of the hatchery operator).
- Farms shall only use nationally and internationally approved additives, preservatives and growth promoters.

### **4.8 FEED AND FEED MANAGEMENT**

- 4.8.1** Feed or feed ingredients shall be certified by the manufacturers to be free from drugs, including antibiotics, or other chemicals, including artificially formulated growth hormones, that are prohibited nationally and internationally
- 4.8.2** For products intended for export into the U.S., feed shall not contain ingredients, food additives, or color additives that are not approved by FDA or “generally recognized as safe” (GRAS).
- 4.8.3** Any uncooked feed ingredients of animal origin For instance dead animals, snail meat, crab meat, etc. shall not be used.
- 4.8.4** Feed that contains shrimp, crab or any other crustacean shell, shall not be used, these may contain SEM (Semicarbazide, which is a metabolite of nitro furan)

- 4.8.5** The use of supplemental feeds should be managed and controlled to limit over feeding, improve the food conversion ratio, and minimize contamination of the pond and outside-environment feeding frequency.
- 4.8.6** Any oversupply of feed shall be strongly discouraged to avoid water pollution, besides wastage of expensive feed.

#### **4.9 HARVEST AND TRANSPORT**

##### **4.9.1 Shed and Shrimp Dumping Facilities at Harvesting Points:**

- Farm shall have a clean shed with a raised and smooth cemented or mosaic floor for dumping and sorting shrimp after harvest; if such a platform is not possible, the farm shall place shrimp on a thick and clean plastic sheet spread under the shed.
- Farms shall use only food grade plastic baskets for holding shrimp.
- Farm shall not use any bamboo baskets and mats of bamboo, old drum used for other purposes jute or other plant materials.

##### **4.9.2 Water Supply:**

- Farm shall have an adequate supply of clean water for washing shrimp, shrimp handling and transport equipment and all other facilities.
- Farm shall have a supply of drinking water for the workers.

##### **4.9.3 Ice Supply:**

- Farm shall have adequate ice storage facilities made of materials that can be effectively cleaned and disinfected regularly.
- Ice shall be procured only from those factories that are licensed by the appropriate authorities to have used water free from arsenic or excessive iron or other hazardous substances and of acceptable microbiological standard.

##### **4.9.4 Synchronizing Farm Harvesting and Shrimp Transportation to Depot/Processing Factory at the Earliest to Ensure Freshness of the Product:**

- Farmer and depot or its agents will work together to synchronize harvesting at the farms, supplying adequate ice of good hygienic quality to the farms, and transporting of *Macrobrachium* in ice to depot and then to factories within the shortest possible time to ensure freshness and more efficiently utilize the processing facilities.
- The supplier or its agent will organize and supervise harvest, gather shrimp in the farm side shed, wash the product in clean water and put in ice water filled chill tank as soon after harvest as possible to cool the product uniformly to temperature below 5°C.
- Farm shall put the *Galda* in boxes with layers of high quality flake or finely crushed block ice in 1:1 ratio.
- The iced product shall be transported in an insulated motor van/carrier vessel to depot as soon as possible; in the absence of an insulated motor van, a paddle

van may be used, but it must have a hood providing adequate shade to the boxes.

#### **4.9.5 Daily Cleaning and Sanitation – Standard Operating Procedure (SOP):**

- Sweep to remove solid wastes and dirt particles.
- Rinse with clean water to remove fine particles of dirt.
- Apply food grade detergent, workout foam with a brush or ‘green pad’ and thoroughly clean shrimp dumping floor or plastic sheet, weighing balance, shrimp boxes, ice crushing box, iced water cooling tank, etc.
- Rinse with safe water.
- Apply sanitizer in the form of 100-200ppm chlorine water to shrimp dumping floor, plastic sheet, shrimp boxes, ice crushing boxes, cooling tank weighing balance, etc.
- After cleaning and sanitizing, completely dry all parts.
- Keep lavatories clean and disinfected all the times.
- Any person with any contagious disease or wounds in hands shall be prohibited from handling shrimp.
- Farm shall store and handle waste and hazardous substances so as to prevent contamination.

#### **4.10 TRACEABILITY RECORDS**

*[Traceability is a system by which shrimp (or any other food products) and any inputs that may have been incorporated into the shrimp can be traced from its origin to the consumer level. In order to accomplish this, all links in the supply chain must keep sufficiently detailed records, as summarised below.]*

- 4.10.1** Farm shall systematically record data in the Record Book as prescribed by the DoF (Competent Authority).
- 4.10.2** Record keeping mentioned in this section should be done as per the format to be given by the Competent Authority.
- 4.10.3** Pre-stocking pond preparation data:
- Date and quantities of lime
  - Fertilizers, or other chemicals used.
- 4.10.4** Farm shall record supply-water sources and microbiological data.
- 4.10.5** Farm shall maintain records of all drugs and chemicals used, including, source data, reasons for use, product traceability codes (for example, lot numbers), and dates and dosages of application.
- 4.10.6** Farm shall maintain records of the nature and sources of feeds, product traceability codes, to the extent available, and dates and quantities used.
- 4.10.7** Farm shall maintain records of sources of PL.

**4.10.8** Farm shall maintain records on the occurrence of diseases that may affect the safety of shrimp.

**4.10.9** Farm shall maintain records of:

- Buyers' names and addresses along with dates
- Pond or lot number and kilos of Galda sold to each buyer.

**4.10.10** Farm shall maintain records on the results of any analyses carried out on samples taken from the pond (soil, water, and shrimp).

## **5. FEED MILL**

### **5.1 LEGAL OWNERSHIP AND RIGHT TO THE USE OF THE FEED MILL**

- 5.1.1** Feed miller must have a legal document that he has legal rights to use the feed mill either as an owner or as a leaseholder.
- 5.1.2** If the feed miller is a leaseholder, he shall have a lease money clearance certificate from the mill owner.
- 5.1.3** Both mill owner and miller must have a copy of the lease document with details of lease conditions and signed by each party and with at least one witness for each party.

### **5.2 REGISTRATION WITH AND LICENSE FROM AN APPROPRIATE ORGANIZATION**

- 5.2.1** The feed mill must be licensed by the Department of Fisheries or other Competent Authority.
- 5.2.2** The feed mill will get license if they are in compliance with the existing regulations, standards, codes and good practices applicable for the establishment and operation of the feed mill
- 5.2.3** The feed mill must have a manufacturing, marketing or distribution license or a license to hold its own products from the Competent Authority.
- 5.2.4** All vendors of shrimp and fish feed ingredients must be licensed and comply with the storage, marketing and transportation rules as set by the Competent Authority.
- 5.2.5** An importer of feed ingredients must have a license from the Competent Authority.
- 5.2.6** All imported feed ingredients must comply with the same conditions as laid down at Section 5.9.6 on Packaging Labeling below.

### **5.3 HARMONY WITH THE COMMUNITY**

- 5.3.1** Feed mill shall work in harmony with the local community.
- 5.3.2** Feed mill shall not deny local communities access to gathering grounds or other public resources

### **5.4 WORKERS' HEALTH AND HYGIENE ISSUES**

- 5.4.1** Workers handling feed ingredients and finished feed shall have a valid and current medical certificate that they are not suffering from any contagious disease.

- 5.4.2 A person with a contagious or communicable disease shall not be permitted access into the feed mill.
- 5.4.3 Workers shall be instructed and/or trained on food safety matters related to their work activities in the feed mill.
- 5.4.4 Workers shall be provided with adequate training on Good Manufacturing Practices (GMPs), the application of the HACCP principles and Good Hygiene Practices (GHPs).
- 5.4.5 Workers shall remove all jewelry and cover hair while working in the feed mill.
- 5.4.6 Workers shall wear neat and tidy dress while working in the feed mill.
- 5.4.7 The feed mill shall have an adequate number of flush lavatories and the lavatories must not open directly into the working areas.
- 5.4.8 The feed mill shall have an adequate number of wash basins with hand cleaning and sanitizing agents.

## **5.5 LABOUR STANDARD COMPLIANCE**

- 5.5.1 Feed mill shall comply with National Labour Law.
- 5.5.2 Feed mill shall have all the essential labour-related documentations as per requirements under the Labour Law and keep them up to date.
- 5.5.3 Feed mill shall strictly comply with the Child Labour Law.

## **5.6 ENVIRONMENTAL PROTECTION AND SUSTAINABILITY**

### **5.6.1 Construction and Operation:**

- Feed mill construction and operations shall not cause any harm to the locality.
- Feed mill construction and operations shall not cause any threat to the neighboring wetland as a result of factory effluents.
- Feed mill shall not pollute or disturb the neighboring environment or any part of the ecosystem.

### **5.6.2 Shrimp Meal and Fish Oil Conservation:**

- Aquafeed producers have an important role to play in adopting sustainable sourcing policies, formulating and manufacturing nutritionally balanced diets that increase feed efficiency, and providing reliable information to their customers.
- It is recommended that aquafeed producers actively favor marine oils and proteins derived from fisheries that are classified by reputable international third parties such as the FAO and ICES as sustainably fished, fully fished or underexploited.

- One example of an appropriate tool for developing a responsible sourcing plan is the Fishsource data bank created by the Sustainable Fisheries Partnership ([www.fishsource.org](http://www.fishsource.org)).
- Feed mills shall strive to reduce dependence on wild fisheries and obtain marine meals and oils from sustainable sources. Certified mills shall provide reliable information on inclusion of such ingredients in compound feeds.

## **5.7 LOCATION, LAYOUT DESIGN AND CONSTRUCTION**

### **5.7.1 Location:**

- The site shall be out of the flood prone area and above average monsoon flood or highest high tide line
- Feed mill shall be easily accessible by road and/or water transports for easy and quick transport of inputs to and finished feed from the feed mill for marketing.
- Feed mill must have easy access to and ample supply of potable water
- The environment of the feed mill shall be neat and clean.

### **5.7.2 Layout Design and Construction:**

- The feed mill floor shall be at least 45 cm above the surrounding ground level.
- The floor and the walls, up to 6 ft. height, should be smooth and made of non-absorbent material fit for regular cleaning and disinfecting.
- Feed mill design shall permit adequate maintenance, cleaning and disinfection.
- Feed mill design and construction shall avoid or minimize air-borne contamination.
- Feed mill design and construction shall protect against insects, rodents, lizards, birds and pet animals that may contaminate feed ingredients and finished feed with pathogenic germs and filth.
- Feed mill design and construction shall protect against the accumulation of dirt, contact with toxic materials, and the shedding of particles into feed.
- Feed mill design and construction shall provide adequate working space to allow hygienic performance of all operations.
- Feed mill design and construction shall provide suitable handling and storage conditions of feed ingredients (e.g., storage of feed at appropriate temperatures and humidity).
- Feed mill design and construction shall provide adequate cleanout procedures for all equipment used in the manufacture and distribution of feed
- Feed mill shall provide an adequate number of flush lavatories that do not open directly into working areas.
- Feed mill shall provide an adequate number of washbasins suitably located and designated for cleaning hands.
- Feed mill shall have foot dips with disinfectants before entering the feed making and handling areas.
- Feed mill shall have adequate natural and/or artificial lighting and ventilation.
- Feed mill shall have adequate drainage facilities designed and constructed to avoid the risk of contamination. Waste shall not flow from a contaminated area towards or into a clean area.

- Feed mill shall ensure facilities for waste disposal in an environment friendly way.
- Feed mill shall have a well separated and secured storage facility for cleaning compounds, disinfectants and other chemicals
- Feed mill shall ensure cleaning compounds, disinfectants and other chemicals are properly labeled, stored and used in a manner to prevent cross-contamination with feed
- Feed mill shall ensure that waste water goes directly into the drain not overflowing the working areas.
- Feed mill shall have adequate solid waste disposal arrangements.
- At the entry of the feed ingredient and finished feed storage and feed production area, there shall be a disinfecting foot-dip and hand washing and sanitizing facilities.

## **5.8 STORAGE AND DISPOSAL OF FEED MILL SUPPLIES AND WASTE**

- Fuel, lubricants and chemicals shall be stored and disposed of in a safe and responsible manner.
- Fuels, lubricants and chemicals should not be stored in or near living quarters, kitchen and dining areas or feed ingredient storage areas.
- Paper and plastic refuse shall be disposed of in a sanitary and responsible way.
- Unused or waste feed ingredients shall be segregated to avoid accidental incorporation into feeds and shall be disposed of properly.

## **5.9 FEED SAFETY**

All precautions must be taken so that the shrimp will remain safe for human consumption at all stages. The list of measures listed below is intended to ensure compliance with overarching food safety requirements.

Regular controls shall be undertaken to ensure compliance with relevant food and feed safety requirements in Bangladesh and the country of export. In case personnel or inspectors should identify any infected or contaminated feed in any lot, the entire lot in which the concerned feed was found shall be destroyed in a manner respectful of the environment.

### **5.9.1 HACCP Plan:**

- Feed mill shall have a current HACCP plan that documents all processes and process controls. Together with Good Manufacturing Practices (GMPs) the implementation of a HACCP plan (or equivalent) will form the basis for the systematic control of food safety related hazards.
- At a minimum the hazard analysis shall address:
  - Potential chemical contamination of ingredients with pesticides, heavy metals or other environmental contaminants.
  - Potential biological hazards such as E. coli, salmonella, etc.

### **5.9.2 Use of Drug and Chemicals:**

- Only nationally and internationally approved chemical and growth promoters may be used

- Feed mill shall not use any prohibited antibiotics, growth hormones, steroids, pesticides or any other hazardous chemicals in the feed or feed ingredients, nor shall feed mill use any feed ingredients already contaminated elsewhere with the above materials.
- For products intended for export into the U.S., feed shall not contain ingredients, food additives, or colorants that are not approved by FDA or “generally recognized as safe” (GRAS).

**5.9.3** Feed mill shall not use shrimp, crab or other crustacean shell as a feed ingredient, since the crustacean shell may contain high levels of nitrofurans, which is a group of prohibited antibiotics.

**5.9.4** Feedmill must have facilities and employed the facilities for disinfecting the ingredients by steaming.

**5.9.5 Maximum permissible level:**

- Feed mill may use any permitted chemicals provided the feed does not contain the chemicals beyond the nationally and internationally set maximum permissible/tolerance levels.

**5.9.6 Packaging and labeling:**

- No feed shall be marketed unless it is contained in an air tight packet or container with the declaration on it that the content is free from any drugs or chemicals that are not approved on a national or international basis for such use.
- The package or the box shall also provide the following information:
  - Maximum Residue Level (MRL) of any restricted chemicals used.
  - Manufacturer’s name, address and Registration Number.
  - Net weight of the feed in container.
  - Expected FCR
  - Names of ingredients used with percent composition of various nutrients.
  - Names of the farmed shrimp, fish or other animals for which the feed is meant.
  - Date of manufacture and date of expiry.
  - Recommended storage temperature and other storage specifications.
  - Traceability code.

**5.10 TRACEABILITY RECORDS**

*[Traceability is a system by which shrimp (or any other food products) and any inputs that may have been incorporated into the shrimp can be traced from its origin to the consumer level. In order to accomplish this, all links in the supply chain must keep sufficiently detailed records, as summarised below.]*

**5.10.1** Feed mill shall systematically record detailed sources, dates, traceability codes, to the extent available, and quantities of all imported or all locally procured feed ingredients, additives or any chemicals used in the feed preparations.

**5.10.2** Feed mill shall maintain a record of selling of feed along with the names and addresses of buyers, quantities of sales by dates and buyers, etc., as per requirement of the country's Competent Authority.

**5.10.3** Feed mill shall maintain records of allchemicals used, including source data, reasons for use, product traceability codes (for example, lot numbers) and dates and dosages of application.

## **6. SHRIMP COLLECTION AND SERVICE CENTRE / DEPOT**

### **6.1 LEGAL OWNERSHIP OR RIGHT TO THE USE OF THE DEPOT AND INFRASTRUCTURE**

- 6.1.1 The depot owner must have a legal document that he has legal rights to use the depot and the infrastructure either as owner or as a leaseholder.
- 6.1.2 In case the depot owner is a leaseholder, he shall have a lease money clearance certificate from the depot owner.
- 6.1.3 Both depot owner and lessee must have a copy of the lease document with details of lease conditions and signed by each party and with at least one witness designated by each party.

### **6.2 COMMUNITY HARMONY**

- 6.2.1 Depot shall work in harmony with the local community.

### **6.3 LABOUR LAW**

- 6.3.1 Depot operator shall comply with the National Labour Law.
- 6.3.2 Depot operator shall comply with the Child Labour Law.

### **6.4 REGISTRATION WITH AND LICENSE FROM AN APPROPRIATE ORGANIZATION**

- 6.4.1 Depot must be licensed by the Department of Fisheries
- 6.4.2 License may only be issued, or renewed, provided the depot complies with applicable regulations on food safety, social responsibilities, environmental sustainability and local development plans

### **6.5 WORKERS' HEALTH AND HYGIENE ISSUES**

- 6.5.1 **Medical fitness:** All workers handling shrimp must have a valid and current medical certificate that they are physically fit for handling shrimp and ice.
- 6.5.2 **Restrictions related to worker's health:** A person with a contagious or communicable disease and any open wounds on hands or limbs should not be permitted to handle shrimp
- 6.5.3 **Dress:** Workers should wear disinfected gum boot, hand gloves, and neat and tidy dress, preferably apron and head gear, while handling shrimp.
- 6.5.4 Depot owners are to ensure that workers are supervised and instructed and/or trained on HACCP principles and good hygiene practices related with their work.

### **6.6 ENVIRONMENTAL PROTECTION AND SUSTAINABILITY**

### **6.6.1 Site selection saving mangrove and common property wetland:**

- Any new depot shall be outside the mangrove area and shall not cause any damage to neighboring mangrove cover.
- Any existing depot in a mangrove area shall plant mangrove plants on the strip of land, if existing and available to him, in between the adjacent river and the depot.
- The depot does not occupy or deny access to any part of common property: road, wetland or flowing canal.
- The depot must have the ability to discharge solid and liquid wastes from the depot in an environmentally friendly way.

## **6.7 FOOD SAFETY**

All precautions must be taken so that the shrimp will remain safe for human consumption at all stages. The list of measures listed below is intended to ensure compliance with overarching food safety requirements.

### **6.7.1 Location:**

- Depot site must be out of flush flood and flood prone area
- Depot shall be easily accessible by road and/or water transports for easy transport of ice to the shrimp farms, easy landing of shrimp from farms to the depot and easy and quick transport of the shrimp to the processing plants.
- Depot must have easy access to an ample supply of potable water
- Depot must have easy access to hygienically safe ice.

### **6.7.2 Layout Design and Construction:**

- Depot floor shall be at or about 45 cm above the ground level.
- The floor and the walls, up to 6 ft. height, should be smooth and made of non-absorbent material fit for regular cleaning and disinfecting.
- Depot shall have sufficient working spaces allowing efficient and hygienic operation and cleaning.
- For dumping the shrimp, there shall be raised mosaic or tile-covered platforms, at least 30 cm high from the floor; this will protect the shrimp from being easily contaminated with dust or dirt.
- For easy handling and sorting of the shrimp by the workers standing on foot, there shall be stainless steel tables.
- Depot, along with its ice crushing area, will have an enclosure preventing entry of pet animals, birds and rodents.
- Doors and windows shall have insect and pests proof screens.
- Storage area for cleaning agents and disinfectants is to be well separated and secured from the shrimp handling and storage areas.
- Used water should go directly into the drain not overflowing the working areas.
- There should be an adequate number of flush lavatories, which are not to open directly into the area in which shrimp is handled.
- There should be an adequate number of washbasins, which are to be provided with materials for cleaning and disinfecting hands.

- Depot shall have adequate natural and artificial lighting arrangements.
- Depot shall have a good drainage system.
- Depot shall have adequate solid waste disposal arrangements.
- At the entry of the shrimp handling area, there shall be a disinfecting foot-dip and hand washing and sanitizing facilities.

**6.7.3 Synchronizing farm harvesting and shrimp transportation to depot and then to factories at the earliest to ensure freshness of the shrimp:**

- Depot and shrimp suppliers or their agents will work together to synchronize harvesting of the farms, supplying adequate ice of good hygienic quality to the farms, and transporting of the shrimp in ice to depot and then to factories within the shortest possible time to ensure shrimp freshness and more efficiently utilize the processing facilities.
- The supplier or its agent will organize and supervise shrimp harvest, gather shrimp in the farm side shed, wash the shrimp in clean water and put the shrimp in ice water filled chill tank immediately after harvest to cool the shrimp uniformly to temperature below 5°C.
- Shrimp shall only be transported under conditions that do not alter their food safety status.
- Shrimp shall be placed in a shrimp box with layers of high quality flake or finely crushed block ice in 1:1 ratio.
- Iced shrimp shall be transported in insulated motor van/carrier vessel to depot; in the absence of an insulated motor van, a paddle van may be used, but it must have a hood providing adequate shade to the shrimp boxes.
- Shrimp should not be exposed to the sun during transport.

**6.7.4 Shrimp shall not be de-headed or de-shelled at farm or depot:**

- Removing head and shell shall not be done in the depot. Shrimp head or shell shall be removed only at the processing factory premises under hygienic conditions.
- Sorting of the shrimp either for grading or separating bad quality shrimp must be completed as soon as possible.
- Handling of the shrimp must be done in hygienic condition.
- Depot must use hygienic ice from licensed ice factories.
- Depot shall use only approved and sanitized plastic boxes for shrimp storage or transport.
- Depot shall not use any bamboo baskets, hogla or jute mats and old drums used for other purposes for storage or packaging of shrimp.
- Shrimp must be repacked in layers of ice in food grade plastic shrimp box carried in refrigerated insulated covered carriers to the factories.

**6.7.5 Daily cleaning and sanitization at the end of work:**

- Sweep to remove solid wastes and dirt particles
- Rinse with potable water to remove fine particles of dirt
- Apply food grade detergent, workout foam with a brush or 'green pad' and thoroughly clean shrimp dumping floor or plastic sheet, weighing balance, shrimp boxes, ice crushing box, iced water cooling tank, etc.

- Rinse with potable water.
- Apply sanitizer in the form of 100-200ppm chlorine or 200ppm quat sanitizer (quaternary ammonium) to shrimp boxes, plastic wares, gloves, ice crushing boxes, weighing balance, etc.
- For floors, walls, foot-dips, toilets: Sanitizer concentration may be doubled.
- After cleaning and sanitizing, completely dry all parts.
- Keep lavatories clean and disinfected all the time.
- Nobody with any contagious or communicable disease or wounds in hands shall be allowed to handle shrimp. Clean the foot-dip every day and refill with fresh disinfecting liquid (200 ppm chlorine water).

## **6.8 TRACEABILITY**

*[Traceability is a system by which shrimp (or any other food products) and any inputs that may have been incorporated into the shrimp can be traced from its origin to the consumer level. In order to accomplish this, all links in the supply chain must keep sufficiently detailed records, as summarised below.]*

### **6.8.1 Shrimp Collection and Service Centre/Depot must obtain records from each supply farm or boat at least the following information:**

- Farm/boat Registration Number,
- Name and address of the supply farm/boat and its owner,
- Date and geographical location of harvesting of the shrimp or fish,
- Type of gear used for harvesting,
- Shrimp/fish iced or not immediately after harvest,
- Source of ice and license number of the ice plant producing the ice,
- Date of receiving the shrimp/fish by species and quantity

### **6.8.2 The depot, on the other hand, must provide to the next buyer of the shrimp the above and the following information:**

- Name and address of the depot
- License number of the depot
- Care provided to the shrimp/fish
- Date, quantity of shrimp/fish by species sold
- Name and address of the buyer

### **6.8.3 Shrimp Collection and Service Centre/Depot shall maintain records on:**

- Occurrence of diseases that may affect the safety of shrimp
- Results of any analyses carried out on samples taken from shrimp or other samples taken for diagnostic purposes, that have importance for human health
- Any relevant reports on checks carried out on shrimp

## **6.9 BIOSECURITY**

### **6.9.1 Shrimp Collection and Service Centre/Depot shall:**

- Ensure that shrimp are protected against contamination

- Ensure that the Shrimp Collection and Service Centre/Depot, including equipment, containers and crates used therein, shall be kept clean and, where necessary after cleaning, disinfected
- Take account the results of any relevant analyses carried out on samples taken from shrimp or other samples that have impacts on food safety
- Take appropriate corrective action when informed of problems identified during official controls

## **7. ICE PLANTS**

### **7.1 LEGAL OWNERSHIP OR RIGHT TO THE USE OF THE ICE PLANT LAND AND INFRASTRUCTURE**

- 7.1.1** Ice plant owner must have a legal document that he has legal rights to use the ice plant and the infrastructure either as owner or as a leaseholder.
- 7.1.2** In case the plant owner is a leaseholder, he shall have a lease money clearance certificate from the ice plant and infrastructure owner.
- 7.1.3** Both ice plant owner and lessee must a copy of the lease document with details of lease conditions and signed by each party and with at least one witness designated by each party

### **7.2 REGISTRATION WITH AND LICENSE FROM AN APPROPRIATE ORGANIZATION**

- The ice plant must be licensed by the Department of Fisheries. –
- License to the ice plant operation may only be issued or renewed, provided it complies with applicable regulations on food safety, hygiene standards, social responsibilities, environmental sustainability and local development plans.

### **7.3 LABOUR LAW**

- Ice plant operators shall comply with the National Labour Law.
- Ice plant operators shall comply with the Child Labour Law.

### **7.4 WORKERS' HEALTH AND HYGIENE ISSUES**

#### **7.4.1 Restrictions related to workers health:**

- **Medical fitness:** All workers handling ice must have a valid medical certificate that they are physically fit to handle product and ice.
- **Contagious or communicable diseases:** A person with a contagious or communicable diseases likely to be transmitted through food or afflicted, for example, by wounds in hands, should not be permitted to handle ice.
- **Dress:** Workers should wear disinfected gum boot, hand gloves and neat and tidy dress, preferably apron and head gear, while handling ice.
- Plant owners are to ensure that workers are supervised and instructed and/or trained on Good Manufacturing Practices(GMPs),HACCP principles and Good Hygiene Practices (GHPs) related with their work activities.

### **7.5 ENVIRONMENT**

#### **7.5.1 Site selection saving mangrove and common property wetland:**

- Any new ice plant shall be outside the mangrove area and shall not cause any destruction to neighboring mangrove cover.

- Any existing ice plant in a mangrove area shall plant mangrove plants on the strip of land, if existing and available to him, in between the adjacent river and the ice plant.
- Ice plant must have the ability to discharge solid and liquid wastes from the ice plant in an environmentally friendly way.

#### **7.5.2 Tidal and monsoon flood level:**

- Ice plant site shall be above the monsoon flood or highest high tide levels.

### **7.6 COMMUNITY RELATIONSHIP**

- The ice plant shall not deny access to or occupy any part of common property, road, wetland or flowing canal.
- Ice plant shall operate in such a way as not to create any social conflict with the community.

### **7.7 FOOD SAFETY**

All precautions must be taken so that the shrimp will remain safe for human consumption at all stages. The list of measures listed below is intended to ensure compliance with overarching food safety requirements.

#### **7.7.1 Location:**

- Ice plant shall be easily accessible by road and /or water transports for easy and quick transport of the ice to the depot and farms.
- Ice plant must have easy access to an ample supply of potable waterfree from excessive iron, arsenic or other hazardous chemicals, silt and pathogenic bacteria loads.
- Ice plant site shall be neat and clean.

#### **7.7.2 Layout design and construction:**

Layout design, construction, and size of ice plant are to:

- Ensure that the ice plant floor is at least 45 cm high above the ground level.
- Ensure that the floor and the wall up to 6 ft height are made of non-absorbent material fit for regular cleaning and disinfecting.
- Permit adequate maintenance, cleaning and disinfection.
- Avoid or minimize air-borne contamination.
- Provide adequate working space to allow hygienic performance of all operations.
- Protect against insects, birds, pets and household animals that may contaminate ice factories and the ice with germs and filth.
- Protect against the accumulation of dirt, contact with toxic materials, the shedding of particles into ice and the formation of condensation or undesirable mould on surfaces.
- Permit good food hygiene practices, including protection against contamination and in particular, pest control.

- Provide suitable temperature-controlled handling and storage conditions of sufficient capacity for maintaining ice at appropriate temperatures.
- Ensure all surfaces are maintained in a sound condition and easy to clean and disinfect.
- Provide adequate facilities for the cleaning, disinfecting and storage of working utensils, equipment, articles and fitting.
- Provide a raised platform of smooth and non-absorbent and non-toxic surface for keeping the ice blocks before their disposal; this will prevent any possible contamination from the floor.
- Provide an adequate number of flush lavatories, which should not open directly into rooms in which ice is handled.
- Provide an adequate number of washbasins suitably located and designated for cleaning hands.
- Have adequate natural and/or artificial lighting and ventilation.
- Have adequate drainage facilities designed and constructed to avoid the risk of contamination; waste waters shall not flow from a contaminated area towards or into a clean area.
- Ice must be made with potable water and is to be handled and stored under conditions that protect it from contamination.
- Ensure facilities for waste disposal in an environment friendly way.
- Ensures that cleaning agents and disinfectants are to be stored in a well separated and secured place which will be away from the ice handling and storage areas
- Ensure that used water goes directly into the drain not overflowing the working areas.
- Have disinfecting foot-dip and hand wash basins at the entrance of the ice factory and at the places where necessary
- Ensure that cans, lids and other equipments and tools that come in contact with ice shall be made of materials approved by the competent
- Ensures that cans, lids and other equipments and tools that come in contact with ice shall always be kept in good condition of repair.
- Ensures that unloading, carrying and crushing of ice shall be done in a hygienic manner.

### **7.7.3 Daily cleaning and sanitization:**

- Ice plant owners are to ensure that ice is protected against contamination during cleaning and sanitation operations.
- Ice plant owners are to clean and sanitize walls, floors, cans, lids, tools and equipments regularly, preferably at the end of the days operation
- Perform dry cleaning first and then sweeping to remove solid wastes and dirt particles.
- Rinse with potable water to remove fine particles of dirt.
- Apply food grade detergent, workout foam with a brush or 'green pad' and thoroughly clean all parts of the fish landing sites, fish handling tables, implements, weighing balance, shrimp boxes, etc.
- Rinse with potable water.
- Apply sanitizer:

- Cans, lids, equipments and tools: 100-200 ppm chlorine or 200ppm quat sanitizer (quaternary ammonium)
- Floors, walls, food dips, toilets: Sanitizer concentration could be doubled.
- After cleaning and sanitizing, completely dry all parts.
- Keep lavatories clean and disinfected at all times.
- Any person with any contagious or communicable disease or wounds in hands shall be prohibited from handling ice.
- Ice plant shall not use any bamboo baskets, hogla or jute mats and old drums used for other purposes for storage or packaging of ice.
- Ice must be carried in refrigerated or insulated or covered carriers
- Workers or visitors shall wash and disinfect their hands at the hand washing basins and disinfect feet in foot-dip (200 ppm chlorine) before entering the ice production and handling areas

## 7.8 TRACEABILITY

***[Traceability is a system by which shrimp (or any other food products) and any inputs that may have been incorporated into the shrimp can be traced from its origin to the consumer level. In order to accomplish this, all links in the supply chain must keep sufficiently detailed records, as summarised below.]***

- Ice plant must be licensed with an authorized organization.
- Ice plant must maintain records of the sources of water and report on the quality analysis of the water with which ice has been made.
- Ice plant must obtain records from each buyer the following information:
- Name and address of the buyer farm/boat/depot and its owner and the dates of selling ice to them;
- Farm/boat/depot Registration/License Number of the buyers.

## **8. FISHING BOATS AND VESSELS**

### **8.1 LABOUR STANDARD COMPLIANCE**

**8.1.1** The boat/vessel must comply with the National Labour Law for the workers of the boat/vessel.

**8.1.2** The boat/ vessel must comply with the Child Labour Law.

### **8.2 LAYOUT DESIGN AND CONSTRUCTION**

**8.2.1** For all boats and vessels:

(a) For ease of cleaning and disinfecting:

- All boats and vessels should be designed and constructed to minimize sharp inside corners and projections and dead ends in order to avoid dirt traps.
- Construction should facilitate ample drainage.
- There shall be a good supply of potable water.
- Fish landing deck or space must be of non-absorbent materials that can be easily and effectively cleaned and disinfected.
- Surfaces with which fishery products come into contact must be made of corrosion-resistant material that is smooth and easy to clean and disinfect.
- Surface coatings must be durable and non-toxic.
- Equipment and material used for working on fishery products be made of corrosion-resistant, easy to clean and disinfect.

(b) For minimizing contamination:

- Boats/Vessels and containers must be designed so as not to cause contamination of the products with bilge-water, sewage, fuel, oil, grease or other objectionable substances.
- Deck areas for handling fish shall be completely separated from storing areas for fuel, chemicals, cleaning agents, etc.
- Boats/vessel shall be equipped with suitable holds, tanks or containers for the storage of fishery products with ice.
- Fish hold shall be designed and constructed to ensure that maximum stowage height of fish is 1 meter.
- Surface must be of suitable corrosion-resistant material that is smooth and easy to clean; surface coatings must be durable and non-toxic.
- Equipment and material used for working on fishery products be made of corrosion-resistant, easy to clean and disinfect.
- Water storage must be situated away from any contamination sources.

**8.2.2** Additional requirements for boats and vessels making voyages of more than 24 hours and require to preserve fresh fishery products for voyage period.

- Boats/vessel shall be equipped with suitable sanitary facilities and hand wash basins for the crew.

- Boats/vessel shall contain adequate insulated holds for ice and iced fish with facilities for drainage of melt water from the iced fish holds.
- There shall be separate holds or tanks for storage of bait if the fishing vessel is a long liner.
- Boats/Vessel shall be equipped with a first aid box containing adequate antiseptic and waterproof wound dressings.
- Holds must be separated from the engine compartments and from the crew quarters by partitions which are sufficient to prevent any contamination of the stored fishery products.
- Holds and containers used for the storage of fishery products must ensure their preservation under satisfactory conditions of hygiene.
- If vessels equipped for chilling fish in cooled clean sea water of good quality, tanks must incorporate devices for achieving a uniform temperature throughout the tanks. Such devices must achieve a chilling rate that ensures that the mix of fish and clean sea water of good quality reaches not more than 3°C after 6 hours after loading and not more than 0°C after 16 hours and allow the monitoring and, where necessary, recording of temperatures.
- Boats/vessel shall contain adequate amount of drinking water for the crew.

### **8.2.3 Additional requirements for freezer and factory vessels (1/2):**

- Vessel must have a receiving area that is easy to clean reserved for taking fishery products on board, designed to allow each successive catch to be separated.
- Vessel must protect the products from the sun or any source of contamination.
- Vessel must have a hygienic system for conveying fish from the receiving area to the work area.
- Vessel must have freezing equipment with sufficient capacity to lower the temperature rapidly so as to achieve a core temperature of minus 18°C.
- Vessel must contain refrigeration equipment to maintain fishery products in the storage holds at or below minus 18°C.
- Refrigerated hold must be equipped with an easily readable temperature-recording device.
- Fish sorting, processing and packaging areas should be easy to clean and disinfect.
- Vessel shall provide suitable wash hand basins, soap and paper towels or other means of hand drying.
- Taps should be non-hand operable and designed to prevent the spread of contamination.
- Vessel shall ensure hygienic storage and disposal of waste.
- If waste is stored and processed on board, separate areas must be allocated for that purpose.
- Vessel shall provide separate holds for storage of by-products.
- Vessel shall provide separate areas for storage of i) packaging materials ii) chemicals and iii) cleaning materials

## **8.3 FOOD SAFETY**

All precautions must be taken so that the shrimp will remain safe for human consumption at all stages. The list of measures listed below is intended to ensure compliance with overarching food safety requirements.

### **8.3.1 Icing fish immediately after harvest:**

- Action of the decomposing bacteria and enzyme can be greatly reduced by lowering down fish temperature around 0 – 5°C.
- Fish should best be chilled in adequate ice, immediately after its harvest.
- Put a layer of ice in the fish hold or fish box and then put a layer of fish and then again a layer of ice; continue this way until the box or the hold is full.
- Proportion of ice and fish should be 1:1.
- Use ice made of potable water free from pathogenic organisms, heavy metals, pesticides or other hazardous chemicals, filths and dirt.
- Fish hold to ensure that maximum stowage height of fish is 1 meter to avoid crushing effect of off upper layers on bottom layers of fish.

### **8.3.2 Handle fish carefully to avoid any physical injuries to the fish:**

- Easy bacterial contamination through injuries.
- Fish with injuries will not be acceptable to export markets.

### **8.3.3 Take precautionary measures to avoid contamination of the net with engine oil**

### **8.3.4 Fishermen should avoid fishing in areas known to be heavily contaminated with hazardous chemicals**

### **8.3.5 Cleaning and sanitization at the end of day's operation:**

- Perform dry cleaning by way of sweeping to remove solid wastes and dirt particles.
- Rinse with clean sea water to remove fine particles of dirt.
- Apply food grade detergent, workout foam with a brush or 'green pad' and thoroughly clean all parts of the fish landing sites, fish handling tables, implements, weighing balance, fish boxes, etc.
- Rinse with potable/safe water.
- Apply sanitizer
  - Food contact surfaces, handling, grading and packing tables: 100-200ppm chlorine or 200ppm quat sanitizer (quaternary ammonium).
  - Floors, walls, food dips and toilets: Sanitizer concentration be doubled.
- After cleaning and sanitizing, completely dry all parts.
- Keep lavatories clean and disinfected all the time.
- Any person with any contagious or communicable disease or wounds in hands shall be prohibited from handling fish.

### **8.3.6 Food Additives:**

Vessel shall only use nationally and internationally approved additives

## **8.4 REGISTRATION WITH AND LICENSE FROM AN APPROPRIATE ORGANIZATION**

- 8.4.1** The boat/vessel must be licensed by the Department of Fisheries.
- 8.4.2** License for the boat/vessel must only be issued, or renewed, provided the boats/vessels comply with applicable regulations on hygiene standard in Bangladesh and the country of export
- 8.4.3** Where applicable, consignment must be accompanied by valid catch certificate issued by the Competent Authority
- 8.4.4** Consignment of shrimps must be accompanied by valid animal health and veterinary certificates issued by the Competent Authority

## **8.5 TRACEABILITY**

*[Traceability is a system by which shrimp (or any other food products) and any inputs that may have been incorporated into the shrimp can be traced from its origin to the consumer level. In order to accomplish this, all links in the supply chain must keep sufficiently detailed records, as summarised below.]*

### **8.5.1 Fishing boat must keep records of at least the following information and deliver the information to the buyer of the fish:**

- (i) Boat Registration Number
- (ii) Name and address of the owner of boat
- (iii) Date and geographical location of harvesting of the fish
- (iv) Quantity of fish harvested by species, date and geographical area
- (v) Type of gear used
- (vi) Fish iced or not immediately after harvest with good quality ice made from licensed ice factory
- (vii) Source of ice
- (viii) Date of delivering the fish by species and quantity
- (ix) Name and address of the buyers

### **8.5.2 Fishing boat shall maintain records on:**

- (i) Results of any analyses carried out on samples taken from fish or shrimp or other samples taken for diagnostic purposes that have importance for food safety
- (ii) Any relevant reports on checks carried out on fish or shrimp

## **8.6 BIOSECURITY**

- 8.6.1** Fishing boat and vessel owners are to ensure that shrimp are protected against contamination
- 8.6.2** Fishing boats and vessels, including equipment, containers and crates used therein, shall be kept clean and disinfected
- 8.6.3** Fishing boat and vessel owner shall take an account of the results of any relevant analyses carried out on samples taken from shrimp or othersthat have importance to food safety.
- 8.6.4** Fishing boat and vessel owner shall take appropriate corrective action when informed of problems identified during official controls.

## **9. SHRIMP OR FISH CARRIER /TRANSPORT VAN**

### **9.1 DESIGN AND CONSTRUCTION**

- 9.1.1** For transportation of iced products, insulated van and for frozen products refrigerated van shall be used
- 9.1.2** Fresh and chilled fish products must be kept at melting ice temperature or at or below 5°C. Frozen products (at its core) at or below minus (-) 18°C, a temperature fluctuation of only 2 degree shall be allowed.
- 9.1.3** Fish transport van or vehicle must be suitably constructed and equipped to maintain a constant low temperature throughout the period of transport.
- 9.1.4** The transport vehicle should be designed and constructed to minimize sharp inside corners and projections in order to avoid dirt traps.
- 9.1.5** The inside surfaces of the fish hold must be smooth and should be made of materials that are non-absorbent, non-corrodible and can be easily cleansed and sanitized.
- 9.1.6** Fish should never be transported exposed to the sun.

### **9.2 REGISTRATION WITH AND LICENSE FROM AN APPROPRIATE ORGANIZATION**

- 9.2.1** The transport vehicle must be registered with and licensed by the Department of Fisheries or any GoB authorized organization.
- 9.2.2** The refrigerated or insulated motor vehicle shall be registered with Bangladesh Road Transport Authority (BRTA) and must have fitness certificate.
- 9.2.3** License to the transport vehicle must only be issued, or renewed provided the vehicles complies applicable regulations on food safety and hygiene standards.
- 9.2.4** Consignment of shrimps must be accompanied by valid animal health and veterinary certificates issued by the Competent Authority.

### **9.3 LABOUR LAW**

- 9.3.1** The transport vehicle operators will comply with the National Labour Law and shall not use child labour.

### **9.4 WORKERS' HEALTH AND HYGIENE ISSUES**

- 9.4.1 Medical fitness:** All workers handling fish or shrimp during transportation must have a valid and current medical certificate that they are physically fit to handle fish.

**9.4.2 Restrictions related to worker's health:** A person with a contagious disease and any open wounds on hands or limbs should not be permitted to handle fish during transportation.

**9.4.3 Dress:** Workers should wear neat and clean dress while handling fish during transportation.

**9.4.4** Workers should not wear jewelry while handling fish during transportation and hair should be covered.

**9.4.5 Training:** (i) The transport operators must be trained in food hygiene and sanitation matters related with their work and (ii) Personal cleanliness and hygiene.

## **9.5 FOOD QUALITY AND SAFETY**

**9.5.1** Keep fish transport vehicles, vessels and containers, boxes and other implements clean and in good repairs and hygienic condition all the time; fish must be transported in such a way as not adversely to affect food safety or their viability

**9.5.2** Shrimp exported to be sold as fresh or cooked shrimp must remain compliant at all times during transport with relevant quality (e.g. freshness) standards applicable in the country of exportation

**9.5.3** All precautions must be taken so that the shrimp will remain safe for human consumption at all stages.

### **9.5.4 Routine cleaning and sanitization at the end of day's operation:**

- At the end of day's operation, brush all parts of the fish carrier vehicle or vessel, fish handling implements, fish boxes, etc. with food grade detergent, thoroughly wash with potable water
- Disinfect all parts with sanitizing agents
  - Shelves, shovels, boxes, etc.: 100-200 ppm chlorine or 200 ppm quat sanitizer (quaternary ammonium)
  - Interior part of the fish hold that does not come in contact with fish: Sanitizer concentration could be doubled
- After cleaning and sanitizing, completely dry all parts.
- No body with any contagious disease or wounds in hands should be allowed to handle fish.
- Parking place of shrimp or fish carrier van must be clean and well maintained.

### **9.5.5 Transportation of non-fish items:**

- Where transport carrier vehicle or vessel and/or containers have been used for transporting anything other than fish, there is to be effective cleaning and disinfecting between loads to avoid the risk of cross contamination.

## **9.6 TRACEABILITY**

*[Traceability is a system by which shrimp (or any other food products) and any inputs that may have been incorporated into the shrimp can be traced from its origin to the consumer level. In order to accomplish this, all links in the supply chain must keep sufficiently detailed records, as summarised below.]*

**9.6.1 The transport operator must obtain the following information from the supplier:**

- Name and address of the fish/shrimp depot/landing center/supplier
- Licence number of the fish/shrimp depot/landing center/supplier.
- Shrimp/fish iced or frozen
- Date and time of receiving the shrimp/fish
- Full traceability particulars of the shrimp or fish

**9.6.2 The transport operator, on the other hand, must provide to the next buyer of the fish the above and the following information:**

- Name and address of the vehicle operator
- Registration (BRTA) and licence (Fish Inspection & Quality Control) numbers.
- Care provided to the fish
- Date and quantities of fish or shrimp by species delivered to the buyer
- Name and address of the buyer

**9.6.3 Transport operator shall maintain records on:**

- Any relevant reports on checks carried out on fish or shrimp (For instance, checks on fish or shrimp temperature, shrimp adulteration, etc.)

**9.7 BIOSECURITY**

**9.7.1** Shrimp/fish carrier transport owners are to ensure that shrimp/fish are protected against contamination

**9.7.2** Shrimp/fish carrier transport vans/vessels, including equipment, containers and crates used therein, shall be kept clean and disinfected

**9.7.3** Take account the results of any relevant analyses carried out on samples taken from shrimp/fish or other samples that have importance to food safety

**9.7.4** Take appropriate corrective actions when informed of problems identified during official controls

## **10. CODE OF CONDUCT FOR FISH / SHRIMP PROCESSING PLANTS**

### **Introduction**

The Code of Conduct (“CoC”) for the shrimp processing industry is a systematic approach to managing shrimp production to achieve international quality standards and to manage the environment for the whole production line, from farm to processing plant, to maintain a sustainable shrimp culture industry and to develop quality shrimp production techniques.

A shrimp processing plant shall have the following three (3) characteristics:

1. It shall ensure sanitary and phytosanitary standard during production;
2. It shall ensure production of high-quality shrimp products that are safe to eat;  
and
3. It shall implement and follow an environmentally friendly and sustainable production process.

CoC certification of a processing plant will help consumers and the industry feel confident that their shrimp products are fresh, clean, and safe for human consumption.

### **OWNERSHIP AND RIGHT TO OPERATE A SHRIMP PROCESSING PLANT AND INFRASTRUCTURE**

- The shrimp processing plant operator must have a legal document stating that it has the legal right to operate either as an owner or as a leaseholder.
- If the shrimp processing plant operator is a leaseholder, he must have (a) a current lease document with clearly spelt out conditions and signed both by the leaseholder and the processing plant owner and (b) a lease money clearance certificate from the processing plant owner.
- Both shrimp processing plant owner and leaseholder must keep a notarized copy of the lease document with details of lease conditions and signed by each party and with at least one witness from each party.
- The deed agreement must mention the validity of the lease.

### **REGISTRATION WITH AND LICENSE FROM AN APPROPRIATE ORGANIZATION**

- The processing plant must be registered and licensed with and obtain any required permits from the Department of Fisheries or any organization authorized by Government of Bangladesh.
- A license will only be given to the processing plant if the plant is in compliance with all relevant national regulations concerning food safety, social responsibilities, environmental sustainability and local development plans.

- Processing plants that process shrimp and shrimp products for export to the United States (“U.S.”) must comply with U.S. Food and Drug Administration (“FDA”) registration requirements.
- Processing plants that process shrimp and shrimp products for export to the European Union (“EU”) must comply with all applicable registration and food hygiene and food safety requirements.
- Processing plants must be approved by the national competent authority as eligible to export EU countries and the processing plants must be enlisted in the European Commission through national competent authority.

### **HARMONY WITH THE COMMUNITY**

Shrimp processing plants shall work in accord with the local community.

- Shrimp processing plants shall not create any environmental hazards or obstacles for the local communities and shall not destroy any public mangrove areas, fishing grounds or other public resources.
- Processing plant shall not create any nuisance through its activities (for instance, waste disposal) to the local community.
- Shrimp processing plants shall not hinder or interfere with other normal activities of the local community.

### **ENVIRONMENTAL PROTECTION AND SUSTAINABILITY**

#### **Site selection of shrimp processing establishment:**

- Shrimp processing plant site selection shall not result in destruction of mangroves and/or public wetlands.
- Shrimp processing plants shall be in an environmentally suitable location.
- Shrimp processing plant shall be outside of any mangrove area or wetland or environmentally sensitive area.
- Shrimp processing plant constructions and operations shall not result in any loss of mangroves or wetlands or affect sensitive coastal ecosystems or sanctuaries.
- Shrimp processing plant sites must permit easy transportation of plant inputs and outputs.
- Processing plants must have a source of sufficient potable water.

- Operation of shrimp processing plants shall not interfere with the natural environment and other normal activities of the location, including access to traditional fishing or gathering grounds for local inhabitants.
- Shrimp processing plant operations shall not pollute the environment.
- Shrimp processing plant must have adequate facilities for waste water treatment and disposal in an environmentally acceptable way.

#### **LABOUR STANDARD COMPLIANCE**

- Shrimp processing plants shall comply with the National Labor Law applicable to processing plants.
- Shrimp processing plants shall not employ child labor and shall strictly comply with the Child Labour Law.
- Shrimp processing plants shall have written labor compliance and service rules.

#### **WORKERS' HEALTH AND PERSONAL HYGIENE**

Working conditions (and employee living conditions, where applicable) shall be safe and healthy for all workers in accordance with national laws and regulations and International Organization standards. Employers must conduct risk assessments to identify hazards and any risk to the health and safety of the employees, take reasonable steps to eliminate or control these risks, and inform, educate, and protect the employees from these risks. Shrimp processing plants must ensure that those who come in contact with shrimp directly or indirectly are not likely to contaminate the shrimp.

Workers must behave in an appropriate manner.

#### **Training:**

- Workers shall be provided with adequate training in the application of the HACCP principles and Good Hygiene Practices (GHPs) prior to be engaged in the processing plant and on a continuing basis.
- All training shall be properly documented, as follows:
  - i. Training location, date and subject material;
  - ii. Name and qualifications of Trainer; and
  - iii. Names and responsibilities of attendees.
- Workers who come into direct contact with raw materials must be trained at regular interval.
- Workers shall be formally instructed and/or trained on food safety and personal hygiene

- Training of individual employees shall be recorded.

**Personal Hygiene Requirements:**

- Processing plant shall maintain a notice board in a conspicuous place stating that all workers shall maintain a high degree of hygiene and sanitation.
- Processing plant operator shall effectively supervise the hygienic procedures conducted by plant staff.
- Prior to be engaged in the plant, each worker shall have received a medical certificate from a registered doctor stating that the person is not a carrier of and is not suffering from any contagious or communicable disease.
- A person with a contagious or communicable disease shall not be permitted access into the shrimp processing plant and shall not handle food in any capacity.
- Persons who have an infected wound or open lesion are not permitted to work in any food handling areas unless the injury is treated and completely protected by a secure, waterproof covering. The processing plant shall maintain written policies and procedures requiring that all employees report wounds and infected lesions and cover such wounds and lesions with a secure waterproof bandage or other covering.
- If a person has an illness, open lesion, or any other abnormal source of microbial contamination by which there is a reasonable possibility of food or food products or packaging becoming contaminated, that person shall be excluded from any operations that may be expected to result in such contamination until the condition is corrected.
- Processing plant shall employ its own medical doctors for routine health checks of employees and must have annual medical check of the facility for workers.
- Processing plant shall maintain written policies and procedures requiring that all employees report contagious illnesses, and that they do not return to work until declared fit to handle shrimp.
- No person shall enter the processing plant without washing, cleaning, and disinfecting his or her hands and feet in running water.
- Every person engaged in handling or processing shrimp shall wash his or her hands thoroughly with warm water and liquid soap immediately before commencing each work shift, after each absence from duty, e.g. use of lavatories, after handling contaminated materials, and between the handling of incompatible shrimp and shrimp products. After washing their hands, workers must disinfect them.
- While handling shrimp and shrimp products, employees shall wash their hands immediately after sneezing, coughing, or touching their face or hair or any insanitary objects.
- Processing plants shall have an adequate number of wash basins with hand cleaning and disinfecting agents.

- Processing plants shall have disinfecting foot baths at the entrances.
- Cleaning and disinfecting agents shall only contain chemicals that are approved by the competent authority for such approved uses.
- **Clothing, Jewelry, and Personal Appearance**
- Workers must maintain an appropriate degree of personal hygiene.
- Workers shall wear neat and tidy dress while working in the shrimp processing plant.
- Workers shall be provided with clean, suitable protective clothing.
- Normal clothing worn under protective clothing shall not be in contact with food products directly or indirectly.
- Protective clothing shall be removed immediately after leaving a processing area and shall not be worn in lunch rooms, lavatories, or other nonproduction areas.
- Protective clothing shall be stored under sanitary conditions, separate from employee normal clothing and separate from lavatories and welfare rooms.
- Protective clothing shall be kept in good condition.
- Every person engaged in processing work shall wear disposable gloves and head gear
- Employees shall wash, disinfect and dry hands before putting gloves on. Used gloves shall not be left on work tables or other product contact surfaces during breaks. Used gloves shall be dropped in waste basket.
- All gloves shall be washed and sanitized when contaminated, at every work break, and at the end of every work shift.
- Water proof garments shall be thoroughly cleaned after each work shift.
- Water proof garments shall be stored under sanitary conditions in separate place.

Employees handling shrimp shall abide by the followings:

- Shall no use nail polish;
- Shall not wear jewellery, including earrings, rings, bracelets and bangles (can be used if they are covered in an acceptable manner).
- Items such as pens, pencils, and thermometers shall not be kept in employees' coat or shirt pockets while working.
- Employees working in the food handling areas shall wear sanitary hair nets that cover hair completely.

- Hairnets worn by staff shall be clean and have sufficiently fine mesh to restrain hair, and shall be kept in good condition.
- All facial hair with the exception of a neatly trimmed moustache shall be covered.

#### **Prohibited Activities**

- Eating, chewing, drinking, spitting and smoking are strictly prohibited in the processing plant.

### **PLANT LAYOUT, DESIGN, AND CONSTRUCTION**

- Floors, walls, doors, door frames, and roofs of product handling and storage areas shall be constructed of approved material that is light-colored, smooth, waterproof, durable, non-absorbent, non-toxic, and easy to clean and disinfect
- Every joint of the shrimp processing plant (*i.e.*, floor to wall, wall to wall and wall to roof) must be parabolic for ease of cleaning and disinfection
- Up to 1.8 meters of the wall must be smooth, durable, waterproof, light-colored and easily washable.
- There shall be sufficient numbers of hand wash basins with knee or foot-operated taps, hand-dips for disinfecting hands and foot bath for disinfecting feet at the entrances of the processing plant.
- There shall be a gumboot/boot washing facility at the entrance of the processing.

#### **Ceilings:**

- Ceilings shall be constructed of approved materials that are light-coloured, smooth, durable, waterproof, non-absorbent, non-toxic, and easy to clean and disinfect.
- Ceilings shall be free from cracks, crevices and open joints.
- Ceilings in each room shall be of acceptable height (at least 3.5 meters) for the operations carried out, and allow for adequate lighting and ventilation.

#### **Doors and Windows:**

- All doors and windows and any open part of the processing plant must be covered and netted in such a way that no dirt, insects, pests, or flies that may affect the safety of the products, can enter into the processing plant.
- The entrances of the processing plant shall be equipped with self-closing double doors made of smooth, non-absorbent and non-corrosive materials.
- Doors and door frames shall be of sufficient height and width for the operation, and frames shall be sealed to the surrounding wall.

- Door and window hardware shall be made of approved materials that are easy to clean and maintain.
- Door, window, door and window frames shall be kept clean and in good condition.

**Drains:**

- Floors shall be sloped to provide adequate drainage such that during operations, there is no standing water or pooling. Where standing water or pooling occurs, it shall be removed regularly in a sanitary manner.
- Each processing and product storage room shall be equipped with floor drains which have sufficient capacity to quickly remove waste water.
- Floor and other drain lines in operational areas must not connect with sanitary sewer lines within the plant.
- Drains shall be covered with corrosion-resistant removable covers and screens. Drain covers shall have openings which permit removal of waste water without the potential for becoming plugged with organic material.
- Drains are to be trapped, vented, and equipped with gates to prevent backflow.

**Overhead Pipes:**

- Where possible, pipes should not be located over processing or working surfaces.
- Pipes over processing areas shall be covered with approved insulation or other approved means for preventing condensation from dripping onto product or product contact surfaces.

**Lavatory:**

- The processing plant shall have an adequate number of flush lavatories.
- The number of toilets provided shall meet the requirements based on the number of employees.
- Separate welfare and lavatory facilities shall be provided for employees working in clean and dirty areas.
- Flush toilets shall be present in adequate numbers for both sexes, based on the following ratios:

1 to 9 employees – 1 toilet;  
 10 to 24 employees – 2 toilets;  
 25 to 49 employees – 3 toilets;  
 50 to 100 employees – 5 toilets;  
 Every 30 employees over 100 – 1 additional toilet.

- Lavatories shall not open directly into any working areas.
- Lavatories shall be located so that employees do not have to cross an incompatible area to gain access.
- Lavatory must be kept clean and in good condition.
- Lavatory must be equipped with a rubbish bin with a lid.
- Flush toilets shall be equipped with floor drains that will prevent any overflow of water or sewage from entering or contaminating a processing area.
- The room in which a toilet facility is located shall:
  - have self-closing doors that completely fill doorway openings;
  - be ventilated to the outside;
  - be well-lit;
  - have walls, doors, and ceilings that are smooth, light in color and that can be readily cleaned; and
  - have a floor that is constructed of impervious material – not vinyl tiles, sheet vinyl, or similar floor coverings – and that can be readily cleaned.
- A sanitary sewage drainage system for the lavatory must be provided. The sewage treatment system must be separate from the wastewater treatment system and operational draining system, including the piping system.
- Coat hooks or similar facilities shall be provided outside the lavatory area, so that workers do not wear protective clothing or carry food into the lavatory area.
- There shall be separate lavatories for males and females and the number of toilets shall conform to the applicable CODEX standard for general food hygiene.

**Lavatory Hand-Washing Facilities:**

- There shall be sufficient numbers of hand wash basins with knee or foot-operated taps and hand-dips in the toilet area with sufficient liquid soap and disinfecting agent.
- Lavatory hand-washing facilities shall be supplied with approved liquid soap in wall mounted dispensers, single-use paper towels in suitable dispensers, and waste receptacles.
- A notice shall be posted in lavatories instructing staff to wash their hands after using the facilities.

**Hand-Washing Facilities:**

- Sanitary washbasins shall be conveniently located in or visible from all food handling areas and in locations where personnel must pass them when returning to food handling areas.
- The number of washbasins available and accessible shall be adequate for the number of workers and the activities being performed.
- Washbasin taps shall be knee or foot operated.
- Washbasins are supplied with approved liquid soap in wall mounted dispensers that are easily accessed and operated by the user.

**Water Temperature and Pressure:**

- Washbasins shall be supplied with potable hot and cold running water.
- Water pressure at washbasins shall be adequate for effective hand washing and rinsing.
- Single use paper towels in suitable dispensers shall be supplied at each hand washing station.
- Waste receptacles for paper waste shall be provided adjacent to washbasins.

**Boot-Washing Facilities:**

- Boot dips or boot washing facilities shall be provided at entrances to processing rooms.
- Boot-washing facilities shall contain an approved sanitizer and shall be maintained in operating condition during processing operations.
- Boot-washing hoses shall be supplied with hot water, and located and used so that they do not contaminate the processing environment.

**Dress-Changing Room:**

- At the entrance of the processing plant, there shall be separate dress-changing facilities for male and female workers.
- There shall be an adequate number of dress-changing rooms for the use of the workers.
- In the dress-changing rooms, every worker shall have a separate cabinet for used and unused clothing. The space of the dress-changing room shall be consistent with the number of workers.

- There shall be an arrangement of sufficient lighting in the dress-changing room.

**Water Facility:**

- The processing plant must have arrangements for a sufficient supply of potable water.
- Consistent with production capacity, the processing plant must have a water reservoir for conservation of potable water.
- The processing plant must have arrangements for a sufficient supply of hot water for the facility available at an appropriate place in the processing plant.
- The water quality should meet the applicable CODEX or WHO standards, or national standards.

**Adequacy and Direction of Airflow (Ventilation):**

- Each room shall be equipped with ventilation which is acceptable for the activity being conducted, and is capable of removing undesirable odours, steam and smoke.
- The ventilation system shall direct air flow from the cleanest to the least clean areas so that air from contaminated areas does not flow into processing rooms.
- Openings for ventilation shall be covered with animal and insect-proof screens or similar devices that are easy to remove for cleaning purposes.
- Ventilation in processing and refrigerated areas shall be such that there is no condensation on ceilings, other overhead structures, or walls.

**Lighting Arrangement:**

- The processing plant must have an arrangement of sufficient light as directed by the competent authority.
- The lighting should be arranged in such a way that every shrimp and other utensil can easily identified.
- All electric lines and switches must be protected from water, and bulbs or tubes must be covered with waterproof, shatterproof, transparent materials.
- No hanging lights shall be permitted in the shrimp processing plant.
- Light fixtures shall be easy to clean and disinfect.
- Light intensity in processing areas and product storage and handling areas is at least 220 lux (20 foot-candles).
- Light intensity in areas where inspection is conducted is at least 800 lux (75 foot candles).

- Light intensity in maintenance, utility and storage rooms is at least 110 lux (10 foot-candles).
- For all areas not specified above, the plant should maintain 500 lux emission of light.

**Processing Area/Line:**

- The shrimp processing plants shall be designed to prevent cross-contamination and must put in place measures to prevent cross-contamination.
- The processing line should be straight or U-shaped and never V- or Z-shaped.
- If there is any risk of contamination, the potentially contaminated area should be separated from the rest of the processing area by a partition or other device in order to ensure processing activities run smoothly.
- Separate processing lines shall be maintained for different types of products and species.
- Materials relating to any product which shall not be used for human consumption should be separated from the processing area.
- There shall be an adequate and separate place and facility for storing, cleaning, and disinfecting equipment, utensils and other essential materials.
- A separate processing line for value-added products should be maintained and should follow the applicable CODEX standard or any other applicable international or national rules and regulations.

**Processing Equipment and Utensils:**

- The equipment, machinery, and furniture which will be used in processing activities should be made of stainless steel or rust-proof material and their design shall be sanitary in nature.
- No wooden utensils or furniture, which will come in direct contact with shrimp or shrimp products, shall be allowed to be used in the processing plant.
- The material used in processing activities must be non-absorbent, non-corrosive, and easy to clean and disinfect.
- The conveyer belt or any part of processing equipment which will come in contact with shrimp must be easy to clean and disinfect.
- Any knife, scissor, hammer, grinder, or blender used in the processing plant should be made of stainless steel or another substance which shall be durable, rust-proof, non-absorbent and non-corrosive.

**Containers:**

- All boxes, receptacles, bins, tanks and trays used for shrimp processing shall be made of approved material and shall be smooth and free of cracks and crevices.
- Receptacles used to hold shrimp, other than live shrimp, shall have provisions for drainage.

**Product Flow:**

- The plant layout and product flow shall be such that offal and contaminated and diseased shrimp and shrimp products are directed away from edible products.
- Product flow shall be such that ready-to-eat products are not backtracked into areas where raw shrimp are handled or stored.
- Product flow shall be such that ready-to-eat products do not cross-over the path of raw shrimp or any other source of contamination.
- Separate rooms and facilities shall be provided for handling, processing and storing edible shrimp and shrimp products.

**Storage of Hazardous Goods, Janitorial and Maintenance Supplies:**

- There shall be separate rooms for the storage of cleaning and janitorial supplies and equipment, maintenance supplies and equipment, and incompatible or hazardous chemicals.

**Waste Disposal:**

- The processing plant shall use an easily cleanable, durable, covered foot-operated bin in order to dispose of waste in a hygienic manner.
- The processing plant must have the ability to destroy or remove waste hygienically.
- The processing plant must take precautions so that during waste disposal and destruction, there is no opportunity to create any environmental hazard, pollution, or cross-contamination.

**Facility Required for Cold/Chilled Storage:**

- Floor, wall, and roof of cold storage shall be smooth, waterproof, and constructed to be easily cleaned and disinfected.
- The height of roof shall be at least 3.5 meters.
- There shall be an arrangement of sufficient lighting in the cold storage area to permit the writing on the carton to be read easily.
- The electric fittings shall be waterproof and bulbs shall be fitted with covers.

- In the cold storage rack, deck, dunnage, furniture, and other items shall be made of non-absorbent and rust-resistant materials.
- The cold storage area shall be fitted with an automatic temperature recording thermometer so that the temperature can be recorded at all times, and the thermometer must be placed in a conspicuous part of the cold storage area for easy visibility.
- The doors of the cold storage area shall be heat-resistant and shall be fitted with an automatic self-starting air curtain.
- The master carton shall be kept systematically on the rack or dunnage at least 25cm from the wall in a row so that cold air can move throughout the cold storage area.
- There shall be an ante room in the front of the cold storage area for the purpose of controlling the temperature of the cold storage area, packing of the commodity, and verifying the quality of the commodity.
- For the purpose of verifying the quality of the commodity in the cold storage area, there shall be a supply of potable water, a weight measurement machine, a balance, a plastic basket, a basin, a steel table, and any other necessary equipment or supplies.
- Jackets, gloves, and gumboots shall be available for use by workers in the cold storage area.
- The cold storage area shall be designed so that no insects, rats, moles, birds or other animals may enter the cold storage area or its courtyard.
- There shall be a separate room within the cold storage area for the purpose of storing packing materials.
- The aforesaid conditions shall only be applicable on one unit cold storage.

**Grounds and Beaches:**

- The grounds of the processing plant shall be kept clean.
- Unused equipment and material shall be stored away from the plant building in such a manner as to discourage pests and contaminants that may affect the safety of the products.
- Grass and bushes shall be maintained in a way that will discourage pests and other diseases that may affect the safety of the products.
- Decorative plantings shall be at least 1 meter from the building.
- All frequently used plant entrance/exit doors shall be self-closing.
- Plant entrance/exit doors shall be kept closed when not in use.

- The building exterior shall be well-maintained and free of holes or openings that may offer entry points or nesting sites for animals.

## **PLANT OPERATIONS**

### **Written Programs for Maintenance of Building and Equipment:**

- There shall be a written preventive maintenance program for all equipment and all plant facilities, including transport vehicles where applicable.
- There shall be a complete schedule for the periodic maintenance of facilities and equipment.
- There shall be an appropriate form for recording periodic and unscheduled maintenance on the facilities and equipment.
- The record of periodic maintenance shall indicate that the maintenance schedule is followed and maintenance is carried out as required.
- The maintenance program shall lists all chemicals used for maintenance purposes.
- All chemicals including maintenance chemicals should be nationally and internationally approved for use in food processing plants and should be used according to the manufacturer's instruction.
- The maintenance program shall include procedures to be followed to protect the integrity of food products during emergencies, breakdown, or equipment failure.

### **Condition of Equipment and Facilities:**

- Building and shrimp processing and handling equipment shall be maintained in acceptable operating condition.
- Equipment shall be located so that it and the surrounding area may be cleaned completely, without adversely affecting any other process or equipment.
- Equipment for each process shall be located to avoid contamination of other equipment or products during operations.
- During operations, there shall be no repairs or alterations to the building or equipment that may jeopardize the integrity and safety of shrimp products.
- No materials or objects shall be stored in inappropriate areas.

### **Sanitation Control Procedures (SCP):**

- If the facility processes shrimp or shrimp products for export to the U.S., in order to comply with applicable regulations, it must have and implement a written sanitation standard operating procedure.

- The processor shall monitor the conditions and practices during processing with sufficient frequency to ensure, at a minimum, conformance with Good Manufacturing Practices pursuant to U.S. law as set out in 21 CFR part 110 that are both appropriate to the facility and the food being processed and relate to the practices required by this Code of Conduct.
- The processor shall correct in a timely manner those conditions and practices that are not met.
- Each processor shall maintain sanitation control records that, at a minimum, document the monitoring and corrections described above.

**Cleaning of the Plant:**

- All cleaning operations shall be done according to a documented cleaning schedule.
- The surroundings of processing plants shall be kept clean.
- Floors, drains, walls, roofs, and other part of the processing plants shall be cleaned and disinfected before and after the start of processing operations.
- Cleaning and disinfection shall be done in such a way to prevent residue of the sanitizer from coming into contact with or contaminating shrimp or shrimp products.

**Cleaning Chemicals:**

- A list of all chemicals used in the plant shall be included in the sanitation program.
- Only nationally or internationally approved chemicals including cleaning and disinfecting agents shall be used, and proof of approvals shall be included in the sanitation program.
- Cleaning and sanitizing agents shall be readily available in adequate quantities.
- Material safety data sheets shall be available for all chemicals in use.

**Cleaning Equipment and gears:**

- Adequate, appropriate and effective cleaning equipment shall be available.
- Cleaning equipment and gears shall be conveniently located and accessible.
- The equipment, utensils and other materials that will come in contact with shrimp shall be cleaned and disinfected before the start and finish of each shift.

**Sanitation of Toilet Facilities:**

- Lavatory and welfare facilities shall be cleaned according to the sanitation program and schedule, and shall be maintained in a clean, sanitary, functional condition during operations.
- Lavatory and welfare facilities shall be included in the written sanitation procedures, schedule and log.

**Adequacy of Cleaning Procedures and Sanitizing Practices:**

- Cleaning and sanitizing procedures shall be carried out as outlined in the sanitation program and according to the cleaning schedule. Rooms and equipment in the plant and transport vehicles and containers used in transport shall be visibly clean when procedures are completed.
- An approved residual sanitizer shall be applied after every cleaning and again prior to start-up of operations if the room has not been used for an extended period.

**Specifications/Policies for and Monitoring of Outside Cleaning Services:**

- Where cleaning and sanitizing services are contracted to an outside company, the plant's written sanitation program shall include a written contract with the contracting company, which specifies that legislated requirements will be met.
- The contract shall refer to the plants written cleaning and sanitizing procedures, schedules, equipment and chemicals, and designate trained staff employed by the contractor to perform the work.
- If cleaning/sanitizing services are contracted, there shall be a written protocol that specifies monitoring procedures, reporting protocols, designated employees and supervisors, and required corrective actions.
- If cleaning/sanitizing services are contracted, the operator shall maintain a record of monitoring procedures which includes observed deficiencies, corrective actions, and designated employees.

**Freezing and cold storage facilities:**

- Freezing Temperature of frozen products should be maintained at -35°C to -40°C (-31 to -40°F)
- The cold storage area shall be maintained at a constant temperature of -18°C to -25°C (0.4-13°F) or below. The temperature shall be recorded automatically and the record shall be maintained for at least 24 months.
- During freezing, the core temperature of frozen shrimp shall be maintained at -18 to -20°C (0.4- to -4°F) or below.

- In cold storage, shrimp shall be preserved in such a manner to protect against any dehydration and oxidation of products.
- Crab, turtle, tortoise or any other animal meat or any essence containing material shall not be put together in cold storage.
- No shrimp may be kept open or outside of cartons in the cold storage area, to prevent shrimp from becoming oxidized or dehydrated.
  - No food, non-food material or any other flavoured material may be stored with frozen shrimp in the cold storage area.
  - Chilled storage shall be maintained at a temperature of below 5°C (41°F) and it shall be recorded properly.
  - Ice storage temperature shall be maintained at 0°C (32°F) or below and it shall be recorded automatically.
  - At all stages of processing except freezing in freezers, shrimp should be kept at 5°C (41°F) or below.
  - Freezing facilities shall be able to reduce the temperature of a one-inch block of unwrapped fillets to -21°C at core (-5.8°F) in two hours or less.
  - Blast freezers shall have the capacity to freeze by means of air temperature at -30°C (-49°F) with an air velocity of not less than 400 feet per minute.
  - Once the temperature of the thickest section of whole fish in the blast freezer reaches -21°C (-22°F), it shall be removed from the blast freezer to the holding freezer.
  - Every frozen storageshall be equipped with a thermometer located at an easily visible place where it will indicate the average air temperature in the room.
  - Chill storagetemperatures shall be routinely monitored and recorded during operations based on a pre-determined schedule.
  - When chill storage temperatures are found to exceed 4°C (39.4°F), appropriate corrective measures shall be taken to protect shrimp products.
  - In chill storage, condensation shall not drip on or near exposed shrimp products.
  - Condensation from cooling units shall be contained in properly built and maintained trays and lines that are connected to floor drains.
  - There shall be no ice build-up on coolingunits.

**Packaging and labeling of Processed Shrimp:**

- All processed products shall be packed in corrugated and laminated inner and master carton.
- Proper labelling procedures shall be maintained.
- Common English name and scientific name of the shrimp or fish
- Name and address of the processor, licence number, brand name and the master carton number
- Drained or net weight of the product
- Date of processing
- Date of expiry of the product
- Names of the ingredients and their percentage (if used)
- Shift code, source code (Traceability code) and consignment number
- Bar code or other codes used for identifying source, and
- Nutritional information

**Storage and Disposal of Processing Supplies:**

- Fuel, lubricants, and other chemicals shall be stored and disposed of in a safe and responsible manner.
- Paper and plastic refuse shall be disposed of in a sanitary and responsible way.

**Hazardous Materials:**

- All toxic compounds and other hazardous products shall be stored in their original containers and working or stock solution shall be properly relabelled
- Hazardous products shall be used according to manufacturers' instructions.
- Use of hazardous products shall not pose a risk to shrimp or any food contact surface

**Calibration of weights and measures:**

- A written procedure for the periodic calibration of all weighing and measuring equipments (weighing scales, thermometers, pH meters, etc.) shall be developed and implemented, specifying responsible staffs and frequencies.
- Calibration of weights and measures shall be recorded in a suitable permanent log chart.
- There shall be regular, periodic checks to ensure that all wall-mounted thermometers are present and functioning.

**Water Use:**

- The temperature of water used for washing shrimp or fish should be maintained at or below 10°C (50°F).
- Only potable water shall be used with regard to each stage of processing.

**Water Quantity/Pressure:**

- The water supply shall be consistently adequate for operational requirements.
- Water pressure shall be consistently adequate for operational requirements

**Water Quality:**

- Water used in food handling and processing areas shall be potable, with microbiological test results as follows:
  - # *E.coli* = 0 per 100 ml of water
  - # *Enterococci* = 0 per 100 ml of water
- Non-potable water used for fire protection, boilers or auxiliary services, shall flow in clearly identified lines and pipes separate from the potable water system, and there shall be no connection between the two systems.

**Water Source and Storage:**

- Water shall come from an acceptable source. The operator shall possess written proof that water meets the requirements of the standards given in the shedule of the Fish& Fish Product (Inspection & Quality Control Rules.
- Source intakes shall be positioned to prevent contamination of the water supply.
- Storage tanks and all hoses and fittings shall be designed and maintained in a way that prevents contamination.

**Protection of Water from Contamination:**

- Hoses and other plumbing connections shall be equipped with vacuum breakers to prevent back-siphonage.
- There shall be no cross-connecting water lines that may lead to contamination of the water system.

**Water Temperature Range:**

- The temperature of the water supply at the hose nozzles used for cleaning and sanitizing equipment and facilities shall be maintained within 43 to 54°C (110–130°F).

**Water Treatment:**

- An approved disinfection system shall be installed to provide continuous disinfection of the water supply.
- Where applicable, records of disinfections shall be maintained and shown that the system is monitored by the operator at least daily.
- If an ultraviolet system is used, the operator shall monitor and document the functionality of the disinfecting system at least daily.
- If ozonation is used, the functionality of the system shall be monitored and documented at least daily.
- If Reverse Osmosis (RO) is used, the functionality of the system shall be monitored and documented at least daily.

**Steam:**

- Steam that comes in contact with food or food contact surfaces shall be potable.
- Boiler chemicals shall be approved for use and listed in the written sanitation program.
- Steam shall be supplied in quantities adequate for operational requirements.

**Ice:**

- Ice manufactured and/or used at the processing plant shall be potable and tested periodically to confirm potability.
- Results of ice testing for potability shall be recorded and maintained and corrective actions shall be taken when adverse results are found.
- Ice purchased from a supplier shall be certified to be manufactured from potable water.
- Equipment used for the manufacture, handling and storage of ice shall be approved by competent authority.
- Equipment used for manufacturing, storage and handling of ice shall be routinely cleaned and sanitized before use and shall be maintained in a sanitary condition during use.
- Personnel shall handle ice in a sanitary manner which prevents contact with unsanitary surfaces.

- Ice that has been used to chill shrimp shall not be reused for any purpose.
- Ice shall be preserved in a hygienic way to prevent contamination of the shrimp.

**Pest Control Procedures:**

- The operator shall have a comprehensive written pest control program that addresses the control of rodents, insects and any other pests that may affect the safety of the products.
- There shall be a written schedule for plant inspections and pest control procedures.
- Routine pest control inspections shall be completed by a designated and trained person.
- Records of completed pest control inspections, including locations, sightings and corrective actions, shall be maintained.

**Pesticide Use:**

- The pest control program shall contain a written list of all pesticides and pest control devices currently in use.
- Bait boxes shall be placed in acceptable locations in the plant.
- Only designated, trained employees shall have access to pest control devices and pesticides.
- During application of pesticides, food products and surfaces shall be protected.
- After pesticides are used, food contact surfaces shall be adequately washed and sanitized before the start of operations.
- Pesticides shall be stored in a locked area accessible only to designated, trained personnel.
- Storage and labelling of pesticides shall meet all applicable legislations.

**Exclusion of Animals:**

- Dogs, cats and other animals or birds are not allowed inside the processing plant or within 10 meters of the entrances.

**Contractor Specifications/Policies:**

- The outside contractor for pest control shall possess a license to use pesticides, and must provide the operator with a copy.

- Where pest control services are contracted to an outside company, the plant's written pest control program shall include a written contract with the contracting company, which specifies that legislated requirements will be met.
- The contract shall provide written pest control procedures, schedules, equipment and chemicals, and shall identify trained staff employed by the contractor to perform the work.

**Monitoring:**

- The activities of the contracting company shall be routinely monitored by a designated, trained, plant employee.
- The procedure for monitoring the contracted pest control company shall be included in the written pest control program.
- Monitoring of the pest control contractor's activities shall be recorded.

**WASTE DISPOSAL**

- All waste, including liquid waste, shall be disposed of hygienically.
- The waste disposal system shall have sufficient capacity to handle all waste produced
- The waste water and sewage disposal system shall meet all regulatory requirements.
- Waste shall be handled and disposed of in a manner that does not attract pests.
- The waste disposal system shall be maintained in good order and repair.
- If the plant is equipped with a catch basin, grease trap or an interceptor used for the purpose of separating solid matter from the plant effluent, these facilities shall not be located in an area where edible shrimp and shrimp products are being handled.
- Matter skimmed from catch basins, grease traps or interceptors shall not be moved through an area where edible products are being handled.

**Removal of Refuse/ Solid Waste Handling:**

- Offal and other refuse shall be removed from processing areas at least daily, or more frequently if necessary.
- A solid waste disposal method shall be in place.
- The method of disposal shall not constitute a food safety hazard.
- Where incineration is used as a garbage disposal method, there shall be no potential for contamination of food products.

**Offal Equipment Use and Identification:**

- Offal bins and receptacles shall be used to store offal only
- Offal bins and receptacles shall be marked to indicate their intended use

**FOOD SAFETY**

- As a general matter, all shrimp and shrimp products must be protected from adulteration with lubricants, fuel, pesticides, cleaning compounds, sanitizing agents, condensate, and other chemical, physical, and biological contaminants.

**Hazard Analysis & Critical Control Points (“HACCP”) Management System**

- If the facility processes shrimp or shrimp products for export to the U.S. and/or the EU, in order to comply with FDA regulations and EU food safety requirements, the facility shall have, implement and maintain a written HACCP plan in order to ensure food safety.
- The HACCP plan shall be specific to each location where shrimp and shrimp products are processed by the processor, and to each kind of shrimp and shrimp product that is processed, but the plan may group kinds of shrimp and shrimp products or production methods together if the food safety hazards, critical control points (“CCPs”), critical limits, and procedures required to be identified and performed are identical for those products or methods.
- At a minimum, the HACCP plan shall:
  - List food safety hazards that are reasonably likely to occur and that must be controlled for each product. Consideration should be given to whether any food safety hazards are reasonably likely to occur as a result of the following:
    - Natural toxins;
    - Heavy materials;
    - Radioactive material;
    - Microbiological contamination;
    - Chemical contamination;
    - Pesticides;
    - Drug residues;
    - Decomposition in scombroid toxin-forming species or in any other species where a food safety hazard has been associated with decomposition;

- Parasites, where the processor has knowledge or has reason to know that the parasite-containing fish or fishery product will be consumed without a process sufficient to kill the parasites, or where the processor represents, labels, or intends for the product to be so consumed;
  - Unapproved use of direct or indirect food or color additives; and
  - Physical hazards.
- List the CCPs for each of the identified food safety hazards, including as appropriate:
  - CCPs designed to control food safety hazards that could be introduced in the processing plant environment; and
  - CCPs designed to control food safety hazards introduced outside the processing plant environment, including food safety hazards that occur before, during, and after harvest;
- List the critical limits that must be met at each of the CCPs;
- List the procedures, and frequency thereof, that will be used to monitor each of the CCPs to ensure compliance with the critical limits;
- Include any corrective action plans that have been developed, to be followed in response to deviations from critical limits at CCPs;
- List the verification procedures, and frequency thereof, that the processor will use; and
- Provide for a recordkeeping system that documents the monitoring of the CCPs. The records shall contain the actual values and observations obtained during monitoring.
- The HACCP plan must be signed and dated by the most responsible individual on-site at the processing facility or by a higher level official of the processor and must be dated and signed (1) upon initial acceptance; (2) upon any modification; and (3) upon verification of the plan whenever any changes occur that could affect the hazard analysis or alter the plan in any way or at least annually.
- Whenever a deviation from a critical limit occurs, the processor shall take corrective action.
- If a facility fails to establish and comply with an appropriate HACCP plan, the relevant EU competent authority or FDA may refuse to allow importation of products from that facility.

## Recordkeeping

- The HACCP plan shall provide for a recordkeeping system that documents the monitoring of the CCPs, and contains the actual values and observations obtained during monitoring.
- Shrimp processing plants must keep records on:
  - The nature and origin of feed to the shrimp;
  - Veterinary medicinal products or other treatments administered to the shrimp, dates of administration and withdrawal periods;
  - The occurrence of diseases that may affect the safety of the products;
  - The results of any analyses carried out on samples taken from shrimp or other samples taken for diagnostic purposes, that have importance for human health; and
  - Any relevant reports on checks carried out on shrimp. All such records shall include:
    - The name and location of the processor or importer;
    - The date and time of the activity that the record reflects;
    - The signature or initials of the person performing the operation; and
    - Where appropriate, the identity of the product and the production code, if any. Processing and other information shall be entered on records at the time that it is observed.
- All required records shall be retained at the processing facility or importer's place of business in the EU and U.S. for at least 1 year after the date they were prepared in the case of refrigerated products and for at least 2 years after the date they were prepared in the case of frozen, preserved, or shelf-stable products, or for a longer period if appropriate.
- Records that relate to the general adequacy of equipment or processes being used by a processor, including the results of scientific studies and evaluations, shall be retained at the processing facility or the importer's place of business in the U.S. for at least 2 years after their applicability to the product being produced at the facility, or for a longer period if appropriate.
- If the processing facility is closed for a prolonged period between seasonal packs, or if record storage capacity is limited on a processing vessel or at a remote processing site, the records may be transferred to some other reasonably

accessible location at the end of the seasonal pack but shall be immediately returned for official review upon demand.

- All required records, plans, and procedures shall be available for official review and copying at reasonable times.

#### **Verification of HACCP Plan by Importer**

- Importers of shrimp products to the U.S. and EU must have in place, implement and maintain a permanent written procedure or procedures to ensure that the shrimp are safe for consumption.
- Importers must maintain a copy of the processor's HACCP plan and a written guarantee that shrimp is processed in accordance with the plan.

#### **Handling Only Wholesome Shrimp**

- The operator shall ensure that only wholesome shrimp products that are not tainted or decomposed are used in shrimp processing.
- Employees shall be trained to segregate and remove unacceptable shrimp prior to processing
- Employees shall be trained to segregate and remove unacceptable shrimp during processing.
- Employees shall handle unacceptable shrimp in a sanitary manner, and shall wash and sanitize their hands and other food contact surfaces if contaminated with unwholesome, tainted or decomposed shrimp.
- Shrimp that falls on the floor shall be removed and disposed of as inedible.

#### **Handling of Decomposed, Tainted or Unwholesome Shrimp**

- There shall be clearly marked or coded containers of acceptable construction used for containing and disposing of inedible, decomposed, tainted or unwholesome shrimp or shrimp products.
- Inedible shrimp containers shall not be in contact with edible shrimp, containers or processing equipment.
- Inedible shrimp containers shall be cleaned and sanitized before being brought into the processing area.
- Personnel who handle inedible shrimp containers shall not handle edible shrimp, containers or processing equipment, or they shall do so only after washing hands and ensuring that their protective clothing is cleaned and sanitized.
- Inedible shrimp containers shall be removed from the processing area promptly.

- There shall be a separate room or area for the storage of inedible products. Inedible products shall not be shipped via the same shipping facility as edible products.
- There shall be facilities for cleaning and sanitizing inedible containers in a manner that will not contaminate the processing environment.
- Inedible shrimp containers shall not be stored in edible product storage areas.

### **Dressing and Filleting Fishes**

- Prior to any processing, round fish shall be washed with running potable water.
- Automated cutting blades and all fish contact surface of dressing, eviscerating and filleting machines shall be continuously rinsed with potable water, and shall be maintained visibly clean.
- Fish processing equipment shall be monitored regularly to ensure that contamination is not caused by the equipment, and that it is routinely adjusted as required.
- Fish exiting automated eviscerating and/or filleting machinery shall be checked continually and any internal organs that may remain attached are trimmed off and any contaminated Fishmeat is appropriately trimmed or removed as inedible product.
- Manually eviscerated and filleted Fish shall be handled cleanly and workers shall have access to hand and equipment rinses. Contaminated Fishmeat shall be removed as inedible product, or trimmed appropriately.

### **Chemical Management**

- Restricted chemicals or other substances shall not be used. The plant must ensure that any use of chemicals will not affect the safety of the shrimp and fish products.

## **SELLING AND TRANSPORTATION OF SHRIMP/FISH AND SHRIMP/FISH PRODUCTS**

### **Techniques to Be Used**

- The processing plant shall use an insulated carrier and ice for long distance transportation of the shrimp to maintain a relatively low and stabilized temperature at 0 to 5°C (32- 41°F).
- For transportation of frozen products, a refrigerated, insulated van should be used.
- During transportation, the temperature of all frozen products shall be maintained at -18°C ( -0.4°F) or below, a temperature fluctuation of 2°C shall be accepted.

### **Transportation Conditions**

- The interior of shrimp product transport vehicles shall be constructed of approved material that is smooth, durable, impervious to moisture, non-absorbent, non-toxic, and easy to clean and disinfect, and is installed in an acceptable manner.
- The interior of transport containers shall be maintained in good condition.

### **Receiving Monitoring**

- Shrimp, and shrimp products and other incoming loads shall be delivered in acceptable, clean and sanitary, and where applicable, refrigerated vehicles.
- Shrimp, and shrimp products received shall be immediately stored in an appropriate area under required temperature conditions.
- There shall be written procedures in place for monitoring the product integrity and suitability of received loads of shrimp products, packaging materials and ingredients.
- There shall be written procedures to be followed when received loads to meet foodsafety requirements.
- The condition of each load of shrimp products, packaging materials and ingredients received shall be recorded on a suitable form, together with corrective actions taken when deviations are found.
- With each load of shrimp received, there shall be documentation of the origin of the shrimp.

### **Prior Notice of Imports**

- Processing plants shall comply with all import requirements for the U.S. and EU, including the requirement to provide prior notice to U.S. FDA before food arrives in the U.S., as set out in 21 CFR §§ 1.276-1.285, and the specific import requirements set out in EU legislation, in particular Commission Regulation (EC) No 136/2004.

## **PRODUCT LABELING AND PACKAGING**

- All cartons and cases used to pack containers of shrimp shall be legibly marked on one end with the name of the establishment, and the processing date (day, month, and year) in such a manner that the information can be readily determined by an inspector.
- All containers of pickled, spiced or marinated shrimp shall be legibly marked with the name of the establishment, and the processing date (day, month, and year) in such a manner that the information can be determined by an inspector.
- All cans of shrimp shall be embossed on one end, identifying the name of the establishment, and the processing date (day, month, and year) in such a manner that the information can be determined by an inspector.
- All hermetically sealed glass containers containing shrimp shall be permanently marked, or have a label affixed identifying the name of the establishment, and the processing date (day, month, and year) in such a manner that the information can be determined by an inspector.
- All products packaged and labeled in the form in which they will be sold to U.S. consumers must contain labels that comply with U.S. law as set out in 21 CFR 101, and their labels must include, at a minimum:
  - A statement of identity or name of the food;
  - A net quantity statement or the amount of product contained in the package;
  - The name and address of the manufacturer, packer, or distributor;
  - The ingredient list;
  - Nutrition labelling; and
  - Identification of allergens.
- All products packaged and labeled in the form in which they will be sold on the EU market must contain labels that comply with applicable EU food labeling legislation. As of December 13, 2014, their labels must include, where applicable, at a minimum:
  - Name of the food;
  - A list of ingredients;
  - Quantity of certain ingredients or categories of ingredients;
  - Net quantity of the food;
  - Date of minimum durability or the ‘use by’ date;
  - Any special storage conditions and/or conditions of use;
  - Name or business name and address of the food business operator;

- Country of origin;
- Instructions for use where it would be difficult to make appropriate use of the food in the absence of such instructions;
- With respect to beverages containing more than 1,2 % by volume of alcohol, the actual alcoholic strength by volume;
- A nutrition declaration.

### **Packaging Materials**

- All containers and packages used for packaging shrimp products shall be made of food grade materials and shall be approved by the national competent authority
- All containers and packages in the form in which they will be sold on the EU market must comply with applicable EU food contact materials legislation, including Good Manufacturing Practices for materials and articles intended to come into contact with food.
- Packaging must be protected from adulteration with lubricants, fuel, pesticides, cleaning compounds, sanitizing agents, condensate, and other chemical, physical, and biological contaminants.
- Containers and packages shall be clean and in good condition when used and shall be used as intended.
- After packaging, packages of shrimp product shall be handled in such a way that the package and product integrity are protected from physical damage or temperature abuse.

### **Packaging Equipment**

- Packaging equipment shall be constructed of acceptable material, and shall be designed so that it can be cleaned and sanitized.
- Packaging equipment shall be located so that the flow of products is in one direction only, and so that no cross-over or back tracking of cooked or smoked and raw products occurs.
- Packaging equipment shall operate consistently and reliably to provide package seals and closures which will protect the integrity and safety of shrimp products.
- Packaging equipment shall be maintained in clean condition during operations so that shrimp products are not contaminated by unacceptable shrimp products, lubricants or any other extraneous or toxic material.

## **TRACEABILITY RECORDS**

*[Traceability is a system by which shrimp (or any other food products) and any inputs that may have been incorporated into the shrimp can be traced from its origin to the consumer level. In order to accomplish this, all links in the supply chain must keep sufficiently detailed records, as summarized below.]*

- Processing plants shall systematically record sources (geographical areas), suppliers and dates of raw materials received.
- All shrimp products exported to EU or US markets shall be traceable. In particular, but not limited to:
  - The traceability of shrimp and feed, and any other substance intended to be, or expected to be, incorporated into the final shrimp product shall be established at all stages of production, processing and distribution;
  - Processing plants shall be able to identify any person from whom they have been supplied with shrimp and feed, or any substance intended to be, or expected to be, incorporated into the final shrimp product;
  - Processing plants shall have in place systems and procedures which allow for this information to be made available to the competent authorities on demand;
  - Processing plants shall have in place systems and procedures to identify the other businesses to which their products have been supplied. This information shall be made available to the competent authorities on demand;
  - Shrimp shall be adequately labelled or identified to facilitate its traceability, through relevant documentation or information in accordance with the relevant requirements of more specific provisions. Processing plants shall maintain records of any drugs used during cultivation of shrimp.
- Processing plants shall maintain records of the sources of feeds, dates and quantities used during cultivation.
- Processing plants shall maintain records of the buyers' names and addresses along with dates and lot numbers.
- Processing plants shall use visible code numbers for detecting the source of raw material.

### **National Residue Control Plan (“NRCP”)**

- To detect the source of contamination, a National Residue Control Plan (NRCP) should be followed.
- Processing plants should have their own FRCP(Factory Residue Control Plan) for monitoring residues of Aquaculture Medicinal Products (AMPs) or chemical contaminants which may pose risk to public health.

## **HACCP Implementation**

- As described above, processing plants must have written Standard Operating Procedures (“SOPs”) and Sanitation Standard Operating Procedures (“SSOPs”) according to U.S. and EU guidelines.
- To monitor the effectiveness of HACCP implementation, every processing plant shall have its own laboratory.

## **Written Sanitation Record and Documentation**

- The plant shall have a written sanitation program which outlines cleaning and sanitizing specifications and procedures for all rooms and all equipment, including transport vehicles and containers used in transport vehicles.
- The sanitation document must record and date all routine cleaning and sanitizing activities.
- The sanitation document shall include provisions for identifying designated staff and recording of observed deficiencies and corrective actions taken.
- Records of buying and selling any products part of the processing chain must be maintained and traceable.
- Documentation and recordkeeping must follow HACCP principles.
- Processing plants must make records available to the national competent authority and regulatory authorities of the importing countries like U.S.FDA and FVO of EU

## **AUDITOR CERTIFICATION**

- Department of Fisheries (“DOF”) officers who have been appointed to be CoC quality auditors are classified into three (3) different groups as follow:
  - Hatchery and farm auditors;
  - Shrimp distributor auditors ;and
  - Processing plant auditors.
- CoC certificate will be issued and signed by authorized DOF personnel.

## **Quality CoC Certification Procedure**

- Any person who would like to obtain a Quality CoC certification must:  
Before the audit:
  - Apply to the project and follow the CoC instruction;

- Submit the request for an audit by the DOF auditors
- After the request is received, officers from DOF will visit the site and inspect the site to determine if the CoC requirements are met.

After the audit:

- If the person seeking to obtain the certification fails the audit, he/she should improve his/her practices and then resubmit the request.
  - If he/she pass the audit, he/she will obtain a CoC shrimp farm certification, CoC distributor certification, or CoC processing plant certification
- If the person seeking to obtain the certification has obtained CoC shrimp farm or CoC distributor certification, he/she may sell shrimp to a CoC certified processing plant. The CoC processing plants can request DOF to provide the Quality label of their shrimp products that certifies their shrimp for export.

### **Documents Required for an Audit Request**

#### **Farm/Hatchery**

- One (1) copy of Farm/hatchery registration/licence document
- One (1) copy of farm/hatchery Location map
- One (1) copy of farm/hatchery owner identification
- One (1) copy of personal identification, if the submitting person is not the owner of farm hatchery a Power of Attorney form must be submitted
- One (1) copy of expired certification is required in case of renewal of certification".

#### **Shrimp Distributor**

- One (1) copy of shrimp business permission registration/licence from the national competent authority
- Other necessary documents

#### **Shrimp Processing Plant**

- One (1) copy of shrimp processing plant licence document
- Other necessary documents

### **Place to Submit Inspection Requests**

- For all CoC inspection requests, all documents shall be submitted to the Department of Fisheries

### **Validity of Certification**

- A CoC certification of farm/hatchery shall be valid for six (6) months, one (1) year, or two (2) years depending on the results of the inspection.
- A shrimp distributor CoC certification shall be valid for six (6) months, one (1) year, or two (2) years depending on the results of the inspection
- Shrimp processing plant CoC certification shall be given to a CoC complying plant and CoC certification labeling shall only be used by this plant for exportation. The CoC certificate shall be valid for one(1) year

## ANNEX 1

### Best Aquaculture Practices (BAP) Seafood Processing Plant Food Safety Standard

Recommended Testing & Verification Standards for Antibiotics & Chemicals for Raw Material and Processed Product				
#	Acceptable Test Methods	Substance and/or Metabolite	Maximum Residual Limit	Minimum Required Performance Limit (MRPL)
1	LC/MC/MS/ELISA	Chloramphenicol	0 ppb	0.3 ppb
2	AOZ/ELISA	Furazolidone	0 ppb	0.1 ppb
3	AMOZ/ELISA	Furaltadone	0 ppb	0.1 ppb
4	SEM/ELISA	Nitrofurazone	0 ppb	0.1 ppb
5	AHD /ELISA	Nitrofurantoin	0 ppb	0.1 ppb
6	ELISA	Sum of Malachite green & Leucomalachite green	0 ppb	2 ppb
7	ELISA	Sum of Crystal violet & Leucocrystal violet	0 ppb	Not set (Reporting limit ≤0.50 ppb)
8	ELISA	Tetracyclines (TTC/OTC/CTC)	100 ppb	
		ppb = parts per billion		

\*ELISA test for initial screening and LC/MS/MS for confirmation of positives.

ELISA            Enzyme-linked immunoabsorbent assay  
 LC/MS/MS    Liquid chromatography/mass spectrometry  
 TTC            Tetracycline  
 OTC            Oxytetracycline  
 CTC            Chlortetracycline)

**ANNEX 2**  
**Best Aquaculture Practices (BAP)**  
**Seafood Processing Plant Food Safety Standard**

*Note: These tests are required for CoC certification.*

**Recommended microbial limits for seafood products<sup>1</sup>**

SI No.	Product category	Microorganism	n	c	Limit per gram or per square cm	
					m	M
01	Fish and Frozen fish	Aerobic plate count	5	3	5x 10 <sup>5</sup>	10 <sup>7</sup>
		<i>Escherichia coli</i>	5	3	11	500
		<i>Salmonella</i>	5	0	0	
		<i>Vibrio parahaemolyticus</i>	5	2	100	1,000
		<i>Staphylococcus aureus</i>	5	2	1,000	10,000
02	Precooked breaded fish products	Aerobic plate count	5	2	5x 10 <sup>6</sup>	10 <sup>7</sup>
		<i>Escherichia coli</i>	5	2	11	500
		<i>Staphylococcus aureus</i>	5	1	1,000	10,000
03	Frozen raw crustaceans	Aerobic plate count	5	3	10 <sup>6</sup>	10 <sup>7</sup>
		<i>Escherichia coli</i>	5	3	11	500
		<i>Staphylococcus aureus</i>	5	2	1,000	10,000
		<i>Salmonella</i>	5	0	0	--
		<i>Vibrio parahaemolyticus</i>	5	1	100	1,000
04	Frozen cooked crustaceans	Aerobic plate count	5	2	5x 10 <sup>5</sup>	10 <sup>7</sup>
		<i>Escherichia coli</i>	5	2	11	500
		<i>Staphylococcus aureus</i>	5	0	1,000	
		<i>Salmonella</i>	10	0	0	
		<i>Vibrio parahaemolyticus</i>	5	1	100	1,000
05	Cooked crab meat	Aerobic plate count	5	2	10 <sup>5</sup>	10 <sup>6</sup>
		Thermal tolerant coliforms	5	2	500	5,000
		<i>Escherichia coli</i>	5	1	11	500
		<i>Staphylococcus aureus</i>	5	0	1,000	
		<i>Listeria</i>	5	0	0	
		<i>Salmonella</i>	30	0	0	
		<i>Vibrio parahaemolyticus</i>	10	1	100	1,000
06	Cooked shrimp	Aerobic plate count	5	2	10 <sup>5</sup>	10 <sup>6</sup>
		Thermal tolerant coliforms	5	2	100	1,000
		<i>Escherichia coli</i>	5	1	11	500
		<i>Staphylococcus aureus</i>	5	2	50	500
		<i>Salmonella</i>	30	0	0	
		<i>Listeria</i>	5	0	0	
07	Fresh and Frozen bivalve mollusks	Aerobic plate count	5	0	5x 10 <sup>5</sup>	
		<i>Escherichia coli</i>	5	0	16	
		<i>Salmonella</i>	20	0	0	
		<i>Vibrio parahaemolyticus</i>	10	0	100	1,000

n=number of representative sample units.

c=maximum allowable number of sample units which exceed microbial level m.

m=microbial level which separates good quality from marginally acceptable quality.

M=hazardous or unacceptable microbial level.

<sup>1</sup>= Adapted from Table 27 (ICMSF, 1986)

### ANNEX 3

***Note:** This annex reflects current Food and Drug Administration (FDA) guidance as of April 2014. The information contained within this annex is subject to change and it is the obligation of the producer to ensure compliance with current regulations and guidelines.*

#### U.S. Food and Drug Administration: Fish and Fishery Products Hazards and Controls Guidance

Fourth Edition – April, 2011, Appendix 5

<b>TABLE A-5 FDA AND EPA SAFETY LEVELS IN REGULATIONS AND GUIDANCE</b>		
<i>(Edited to include only references to shrimp and scampi)</i>		
<b>Product</b>	<b>Organism or Substance</b>	Acceptable limit
Ready-To-Eat Fishery Products (Minimal Cooking By Consumer)	Listeria monocytogenes	Absence of organism in 25 gram sample.
All Fish	Salmonella spp.	Absence of organism in 25 gram sample
Ready-To-Eat Fishery Products (Minimal Cooking By Consumer)	Vibrio cholera	Absence of toxigenic O1 or O139 or non-O1 and non-O139 in 25 gram sample.
Ready-To-Eat Fishery Products (Minimal Cooking By Consumer)	Vibrio parahaemolyticus	Levels equal to or greater than $1 \times 10^4/g$ (Kanagawa positive or negative).–
Ready-To-Eat Fishery Products (Minimal Cooking By Consumer)	Vibrio vulnificus	Absence of organism
All fish	Clostridium botulinum	1. Absence of viable spores or vegetative cells in products that will support their growth; or 2. Absence of toxin.
All fish	Polychlorinated Biphenyls (PCBs)	2.0 ppm (edible portion) <sup>1</sup>
All fish	Aldrin and dieldrin	0.3 ppm (edible portion)
All fish	Chlordane	0.3 ppm (edible portion)
All fish	Chlordecone	0.4 ppm crabmeat and 0.3 ppm in other fish (edible portion)
All fish	DDT, TDE, and DDE	5.0 ppm (edible portion)
All fish	Endothall and its monomethyl ester	0.1 ppm <sup>1</sup>
All fish	Mirex	0.1 ppm (edible portion)
All fish	Diquat	0.1 ppm <sup>1</sup>
All fish	2,4-D	1.0 ppm. <sup>1</sup>
All fish	Chloramphenicol; Clenbuterol;	Drugs prohibited for extra-label use in animals – <b>no residue</b>

	Diethylstilbestrol (DES); Dimetridazole, Ipronidazole, and other Nitroimidazoles; Furazolidone, Nitrofurazone, and other nitrofurans; Fluoroquinilones; Glycopeptides.	<b>permitted.</b>
All fish	Methylmercury	1.0 ppm
All fish	Hard or sharp foreign object	Generally 0.3 (7 mm) to 1.0 (25 mm) in length

1 – These values are tolerances

Note: The term “fish” refers to fresh or saltwater finfish, crustaceans, other forms of aquatic life other than birds or mammals, and all mollusks, where such animal life is intended for human consumption , as defined in the Fish and Fishery Products, “Definitions,” 21 CFR 123.3(d).

## ANNEX 4

**Note:** *This annex reflects current FDA guidance as of April 2014. The information contained within this annex is subject to change and it is the obligation of the producer to ensure compliance with current regulations and guidelines.*

### **FDA High Enforcement Priority Aquaculture Drugs**

The FDA's Center for Veterinary Medicine (CVM) has identified a number of drugs and families of drugs historically used in fish without FDA approval that are of high enforcement priority. They should not be used in fish that is to be consumed, unless a sponsor obtains an approval or index listing for them. The following list identifies these compounds (CVM Program Policy and Procedures Manual Attachment: "Enforcement Priorities for Drug Use in Aquaculture" (Guide 1240.4200) (<http://www.fda.gov/downloads/AnimalVeterinary/GuidanceComplianceEnforcement/PoliciesProceduresManual/ucm046931.pdf>):

- Chloramphenicol;
- Nitrofurans;
- Fluoroquinolones and Quinolones;
- Malachite Green;
- Steroid Hormones.

(U.S. Food and Drug Administration: Fish and Fishery Products Hazards and Controls Guidance, Fourth Edition – April 2011, Chapter 11.)

## ANNEX 5

**Note:** *This annex reflects current FDA guidance as of April 2014. The information contained within this annex is subject to change and it is the obligation of the producer to ensure compliance with current regulations and guidelines.*

### **Drugs Prohibited by the FDA for Extra-Label Use**

The drugs and families of drugs listed below are prohibited for extra-label use in food-producing animals. 21 CFR 530.41(a). “Extra-label use” is defined as “actual use or intended use of a drug in an animal in a manner that is not in accordance with the approved labeling. This includes, but is not limited to, use in species not listed in the labeling, use for indications (disease or other conditions) not listed in the labeling, use at dosage levels, frequencies, or routes of administration other than those stated in the labeling, and deviation from the labeled withdrawal time based on these different uses.” 21 CFR 530.3(a).

- Chloramphenicol
- Clenbuterol
- Diethylstilbestrol (DES)
- Dimetridazole, Ipronidazole, and other Nitroimidazoles
- Furazolidone and Nitrofurazone
- Fluoroquinolones
- Glycopeptides

None of these drugs and families of drugs has been approved for use in fish.

(U.S. Food and Drug Administration: Fish and Fishery Products Hazards and Controls Guidance, Fourth Edition – April 2011, Chapter 11.)

## ANNEX 6

**Note:** This annex reflects current FDA guidance as of April 2014. The information contained within this annex is subject to change and it is the obligation of the producer to ensure compliance with current regulations and guidelines.

### FDA Approved Aquaculture Drugs

FDA-approved aquaculture drugs, with their approved sponsor, species for which they have been approved, and required withdrawal times are listed below. Additional details on conditions of use (e.g., dosage levels) can be obtained from the Code of Federal Regulations (CFR) as cited below; the labeling for the drug; the FDA CVM Website, (<http://www.fda.gov/AnimalVeterinary/DevelopmentApprovalProcess/Aquaculture/ucm132954.htm>).

FDA's determination that these substances are approved aquaculture drugs does not exempt facilities from complying with other federal, state, tribal, territorial and local environmental requirements. For example, in the United States, facilities using these substances would still be required to comply with the National Pollutant Discharge Elimination System requirements.

<p>Chorionic gonadotropin<sup>®</sup> <u>Chorulon</u></p>	<p>Chorulon<sup>®</sup>, supplied by Intervet, Inc., Roseland, NJ, is approved for use as an aid in improving spawning function in male and female brood finfish. The drug may be administered for up to three doses. The total dose should not exceed 25,000 I.U. chorionic gonadotropin in fish intended for human consumption. Federal law restricts this drug to use by or on the order of a licensed veterinarian (21 CFR 522.1081). Because residues are expected to be well below the safe concentration in the edible portion of fish, there is no tolerance level set for residues of gonadotropin in fish tissue (21 CFR 556.304).</p>
<p>Formalin Solution<sup>®</sup> Paracide-F<sup>®</sup></p> <p><u>Parasite-S<sup>®</sup>, Formacide-B<sup>®</sup></u> <u>and Formalin-F<sup>®</sup></u></p>	<p>Paracide-F<sup>®</sup>, supplied by Argent Laboratories, Redmond, WA, is approved for use as follows: in salmon, trout, catfish, largemouth bass, and bluegill for the control of external protozoa (Ichthyophthirius spp., Chilodonella, spp., Costia spp., Scyphidia spp., Epistylis spp., and Trichodina spp.) and monogenetic trematodes (Cleiodiscus spp., Gyrodactylus spp., and Dactylogyrus spp.); and on the eggs of salmon, trout, and esocids for the control of fungi of the family Saprolegniaceae (21 CFR 529.1030). There is no mandatory withdrawal time prior to harvest and no residue tolerance (formalin does not bioaccumulate in animals). This drug is approved as an over-the-counter (OTC) product, and a prescription is not required.</p> <p><u>Parasite-S<sup>®</sup>, Formacide-B<sup>®</sup> and Formalin-F<sup>®</sup></u> Parasite-S<sup>®</sup> is supplied by Western Chemical, Inc., Ferndale, WA. Formacide-B<sup>®</sup> is supplied by B.L. Mitchell, Inc.,</p>

	<p>Leland, MS. Formalin-F<sup>®</sup> is supplied by Natchez Animal Supply Company, Natchez, MS. Each is approved for use to control external protozoan parasites (<i>Chilodonella</i> spp., <i>Costia</i> spp., <i>Epistylis</i> spp., <i>Ichthyophthirius</i> spp., <i>Scyphidia</i> spp., and <i>Trichodina</i> spp.) and monogenetic trematodes (<i>Cleidodiscus</i> spp., <i>Dactylogyrus</i> spp., and <i>Gyrodactylus</i> spp.) on all finfish species; external protozoan parasites (<i>Bodo</i> spp., <i>Epistylis</i> spp., and <i>Zoothamnium</i> spp.) on Penaeid shrimp; and fungi of the family Saprolegniaceae on the eggs of all finfish species (21 CFR 529.1030). There is no mandatory withdrawal time prior to food animal harvest and no residue tolerance (formalin does not bioaccumulate in animals). These drugs are approved as OTC</p>
Florfenicol	<p><u>Aquaflor<sup>®</sup> Type A Medicated Article</u>  Aquaflor<sup>®</sup> Type A is supplied by Intervet, Inc., Millsboro DE/ Schering-Plough Animal Health Corporation, Roseland, NJ, and is approved for use in medicated feed for the control of mortality due to enteric septicemia of channel catfish (<i>Ictalurus punctatus</i>) associated with <i>Edwardsiella ictaluri</i>, control of mortality in freshwater-reared salmonids due to coldwater disease associated with <i>Flavobacterium psychrophilum</i>, and control of mortality in freshwater-reared salmonids due to furunculosis associated with <i>Aeromonas salmonicida</i>. The minimum withdrawal time before harvest is 12 days for catfish and 15 days for salmonids (21 CFR 558.261). The tolerance level for florfenicol amine (the marker residue) in muscle is 1 ppm (21 CFR 556.283). The product is restricted to use by or on the order of a licensed veterinarian (21 CFR 558.261). Extra-label use of medicated feed containing florfenicol is prohibited (21 CFR 558.6(a)(4) and (6)).</p>
<u>Aquaflor<sup>®</sup> CA1</u>	<p>Aquaflor<sup>®</sup> CA1 is supplied by Intervet, Inc./ Schering-Plough Animal Health Corporation, Roseland, NJ, and is approved for use in medicated feed for the control of mortality in catfish due to columnaris disease associated with <i>Flavobacterium columnare</i>. The drug can be used at any stage of production, from fingerling to food fish, as the sole ration for 10 consecutive days. The minimum withdrawal time before harvest is 12 days. The product is restricted to use by or on the order of a licensed veterinarian (21 CFR 516.1215). Extra-label use of medicated feed containing florfenicol is prohibited (21 CFR 558.6(a)(4) and (6)). Because Aquaflor<sup>®</sup> CA1 is a conditionally approved new animal drug, it extra-label use is also prohibited by 21 U.S.C. 360ccc(a)(1).</p>
Tricaine methanesulfonate (MS-222)	<p><u>Finquel<sup>®</sup> and Tricaine-S</u>  Finquel<sup>®</sup> is supplied by Argent Laboratories, Redmond, WA, and Tricaine-S is supplied by Western Chemical, Inc., Ferndale, WA, Tricaine-S. This drug is approved for use to</p>

	<p>temporary immobilization of fish, amphibians, and other aquatic cold-blooded animals. Tricaine methanesulfonate has been recognized as a valuable tool for the proper handling of these animals during manual spawning (fish stripping), weighing, measuring, marking, surgical operations, and transport. Use in fish intended for human consumption is restricted to the following families: Ictaluridae (catfish), Salmonidae (salmon and trout), Esocidae (pike), and Percidae (perch). There is a mandatory 21 day withdrawal time before harvest. In other non-food, aquatic, cold-blooded animals, the drug should be limited to hatchery or laboratory use (21 CFR 529.2503). These drugs are approved as OTC products, and a prescription is not required. There is no tolerance level set for residues in fish tissue.</p>
<p>Oxytetracycline:  <u>Terramycin<sup>®</sup> 200 for Fish (oxytetracycline dihydrate) Type A Medicated Article</u></p> <p><u>OxyMarine<sup>™</sup>, Oxytetracycline HCl Soluble Powder-343, Terramycin-343, TETROXY Aquatic</u></p>	<p>Terramycin<sup>®</sup> 200 for Fish (oxytetracycline dihydrate) Type A Medicated Article is supplied by Phibro Animal Health, Ridgefield Park, NJ. Terramycin<sup>®</sup> 200 for Fish is approved for use to treat bacterial hemorrhagic septicemia caused by Aeromonas liquefaciens and pseudomonas disease in catfish. For salmonids, Terramycin<sup>®</sup> 200 for Fish is approved for use to control ulcer disease caused by Hemophilus piscium, furunculosis caused by Aeromonas salmonicida, bacterial hemorrhagic septicemia caused by Aeromonas liquefaciens, pseudomonas disease and for control of mortality due to coldwater disease associated with Flavobacterium psychrophilium. This drug is also approved for use to mark skeletal tissue. For lobster, Terramycin<sup>®</sup> 200 for Fish is approved for use to control gaffkemia caused by Aerococcus viridians. Withdrawal times vary with indication as follows: for marking skeletal tissue in Pacific salmon, 7 days; for disease control in salmonids, 21 days; catfish, 21 days; lobster, 30 days (21 CFR 558.450).</p> <p>OxyMarine<sup>™</sup> is supplied by Alpharma, Inc., Fort Lee, NJ. Oxytetracycline HCl Soluble Powder-343 is supplied by Teva Animal Health, Inc., St. Joseph, MO. Terramycin-343 is supplied by Aquatic Health Resources. TETROXY Aquatic is supplied by Cross Vetpharm Group Ltd., Dublin, Ireland. Each of these drugs is administered by immersion, approved for use to mark skeletal tissue of all finfish fry and fingerlings as an aid in identification. These drugs are approved as OTC products, and a prescription is not required. A tolerance level of 2 ppm in muscle tissue (as the sum of tetracycline residues, including oxytetracycline, chlortetracycline, and tetracycline) has been established for all finfish and lobster (21 CFR 556.500).</p>
<p>Hydrogen peroxide  <u>35% PEROX-AID<sup>®</sup></u></p>	<p>35% PEROX-AID<sup>®</sup>, supplied by Eka Chemicals, Inc., Marietta, GA, is approved for the control mortality in</p>

	freshwater-reared finfish eggs due to saprolegniasis; freshwater-reared salmonids due to bacterial gill disease; and freshwater-reared coolwater finfish and channel catfish due to external columnaris disease. This drug is approved as an OTC product, and a prescription is not required. There are no limitations on acceptable daily intake; there is no required withdrawal time; and no tolerance has been set for residues in fish tissue. However, as with all new animal drugs, a licensed veterinarian is required to prescribe an extra-label use of 35% PEROXAID <sup>®</sup> to treat diseases or species not listed on the product label (21 CFR 529.1150).
Sulfamerazine	Sulfamerazine, supplied by Alpharma, Inc., Bridgewater, NJ, is approved for use only in trout (rainbow, brook, and brown) to control furunculosis. It may be used for treatment not more than 14 days. The withdrawal time is 21 days before harvest for marketing or stocking in stream open to fishing (21 CFR 558.582). A tolerance of zero is established for residues of sulfamerazine in the edible flesh (21 CFR 556.660).
Sulfadimethoxine/ormetoprim combination <u>Romet-30<sup>®</sup></u>	Romet-30 <sup>®</sup> , supplied by Pharmaq AS, Overhalla, Norway, is approved for use only in medicated feed only for control of enteric septicemia of catfish caused by Edwardsiella ictaluri and furunculosis in salmonids (trout and salmon) caused by Aeromonas salmonicida. Required withdrawal times are as follows: salmonids, 42 days; catfish, 3 days (21 CFR 558.575). The withdrawal time for catfish is shorter because any residues that might be present in the skin are removed during processing. The tolerance for Sulfadimethoxine and ormetoprim in the flesh is 0.1 ppm for each drug (21 CFR 556.490 and 556.640).

(U.S. Food and Drug Administration: Fish and Fishery Products Hazards and Controls Guidance, Fourth Edition – April 2011, Chapter 11.)

## ANNEX 7

**Note:** This annex reflects current FDA guidance as of April 2014. The information contained within this annex is subject to change and it is the obligation of the producer to ensure compliance with current regulations and guidelines.

### FDA Low Regulatory Priority Aquaculture Drugs

The FDA's CVM has identified a number of unapproved aquaculture drugs that are of low regulatory priority when used in food fish. The following list identifies these compounds and provides their indicated use and usage levels (CVM's Policy and Procedures Manual Attachment: "Enforcement Priorities for Drug use in Aquaculture" (Guide 1240.4200) (<http://www.fda.gov/downloads/AnimalVeterinary/GuidanceComplianceEnforcement/PoliciesProceduresManual/UCM046931.pdf>).

The FDA does not intend to take enforcement action against low regulatory priority substances if the following conditions are met: (1) the substances are used for the stated indications; (2) the substances are used at the stated levels; (3) the substances are used according to good management practices; (4) the product is of an appropriate grade for use in food animals; and (5) use of these products is not likely to result in an adverse effect on the environment.

FDA's enforcement position on the use of these substances should not be considered an approval, or an affirmation of their safety and effectiveness. The agency reserves the right to take a different position on the use of any or all of these substances at some time in the future.

FDA's determination that these substances are new animal drugs of low regulatory priority does not exempt facilities from complying with other federal, state, tribal, territorial and local environmental requirements. For example, in the United States, facilities using these substances would still be required to comply with the National Pollutant Discharge Elimination System requirements.

<b>Acetic Acid</b>	Used in a 1,000 to 2,000 ppm dip for 1 to 10 minutes as a parasiticide for fish.
<b>Calcium Chloride</b>	Used to increase water calcium concentration to ensure proper egg hardening. Dosages used would be those necessary to raise calcium concentration to 10 to 20 ppm CaCO <sub>3</sub> . Used up to 150 ppm indefinitely to increase the hardness of water for holding and transporting fish in order to enable fish to maintain osmotic balance.
<b>Calcium Oxide</b>	Used as an external protozoicide for fingerlings to adult fish at a concentration of 2,000 mg/L for 5 seconds.
<b>Carbon Dioxide Gas</b>	Used for anesthetic purposes in cold, cool, and warm water fish.
<b>Fuller's Earth</b>	Used to reduce the adhesiveness of fish eggs to improve hatchability.
<b>Garlic</b> (whole form)	Used for control of helminth and sea lice infestations of marine salmonids at all life stages.

<b>Ice</b>	Used to reduce metabolic rate of fish during transport.
<b>Magnesium Sulfate</b>	Used to treat external monogenic trematode infestations and external crustacean infestations in fish at all life stages. Used in all freshwater species. Fish are immersed in a 30,000 mg MgSO <sub>4</sub> /L and 7000 mg NaCl/L solutions for 5 to 10 minutes.
<b>Onion</b> (whole form)	Used to treat external crustacean parasites, and to deter sea lice from infesting external surface of salmonids at all life stages.
<b>Papain</b>	Used in a 0.2% solution to remove the gelatinous matrix of fish egg masses in order to improve hatchability and decrease the incidence of disease.
<b>Potassium Chloride</b>	Used as an aid in osmoregulation; relieves stress and prevents shock. Dosages used would be those necessary to increase chloride ion concentration to 10-2000 mg/L.
<b>Povidone Iodine</b>	Used in a 100 ppm solution for 10 minutes as an egg surface disinfectant during and after water hardening.
<b>Sodium Bicarbonate</b>	Used at 142 to 642 ppm for 5 minutes as a means of introducing carbon dioxide into the water to anesthetize fish.
<b>Sodium Chloride</b>	Used in a 0.5% to 1.0% solution for an indefinite period as an osmoregulatory aid for the relief of stress and prevention of shock; and 3% solution for 10 to 30 minutes as a parasiticide.
<b>Sodium Sulfite</b>	Used in a 15% solution for 5 to 8 minutes to treat eggs in order to improve their hatchability.
<b>Thiamine Hydrochloride</b>	Used to prevent or treat thiamine deficiency in salmonids. Eggs are immersed in an aqueous solution of up to 100 ppm for up to four hours during water hardening. Sac fry are immersed in an aqueous solution of up to 1,000 ppm for up to one hour.
<b>Urea &amp; Tannic Acid</b>	Used to denature the adhesive component of fish eggs at concentrations of 15g urea and 20g NaCl/5 liters of water for approximately 6 minutes, followed by a separate solution of 0.75 g tannic acid/5 liters of water for an additional 6 minutes. These amounts will treat approximately 400,000 eggs.

(U.S. Food and Drug Administration: Fish and Fishery Products Hazards and Controls Guidance, Fourth Edition – April 2011, Chapter 11.)

## ANNEX 8

**Note:** This annex reflects current European Union's Commission Regulation (EU) 37/2010 of April 2014. The information contained within this annex is subject to change and it is the obligation of the producer to ensure compliance with current regulations and guidelines.

### European Union Veterinary Residues: Banned Drugs

<b>This list appears in Table 2 of Commission Regulation (EU) 37/2010</b>
Substances in this list constitute a hazard to the consumer when present in foodstuffs at whatever level. Therefore, their presence in foodstuffs is not allowed.
List of pharmacologically active substances for which <b>no Maximum Residue Level (MRL) can be fixed.</b>
<ul style="list-style-type: none"><li>• <i>Aristolochia</i> spp. and preparations thereof</li><li>• Chloramphenicol</li><li>• Chloroform</li><li>• Chlorpromazine</li><li>• Colchicine</li><li>• Dapsone</li><li>• Dimetridazole</li><li>• Metronidazole</li><li>• Nitrofurans (including furazolidone)</li><li>• Ronidazole</li></ul>

## ANNEX 9

**Note:** This annex reflects current European Union's Commission Regulation (EU) 37/2010 of April 2014. The information contained within this annex is subject to change and it is the obligation of the producer to ensure compliance with current regulations and guidelines.

### European Union Veterinary Residues: List of MRLs of Pharmacologically Active Substances Allowed in Seafood

This list is adapted from Table 1 of Commission Regulation (EU) 37/2010				
Pharmacologically active substance(s)	Animal species	MRLs (µg/kg)	Target tissues	Other provisions (according to Article 14(7) of Regulation 470/2009)
Amoxicyllin	All food-producing species	50 50 50 50	Muscle Fat Liver Kidney	*
Ampicillin	All food-producing species	50 50 50 50	Muscle Fat Liver Kidney	*
Benzylpenicillin	All food-producing species	50 50 50 50	Muscle Fat Liver Kidney	*
Chlortetracycline	All food-producing species	100 300 600 200	Muscle Liver Kidney Eggs	*
Cloxacillin	All food-producing species	300 300 300 300	Muscle Fat Liver Kidney	*
Colistin	All food-producing species	150 150 150 200 300	Muscle Fat Liver Kidney Eggs	*
Cypermethrin	Salmonidae	50	Muscle and skin in natural proportions	
Danofloxacin	All food-producing	100 50	Muscle Fat	*

<b>This list is adapted from Table 1 of Commission Regulation (EU) 37/2010</b>				
<b>Pharmacologically active substance(s)</b>	<b>Animal species</b>	<b>MRLs (µg/kg)</b>	<b>Target tissues</b>	<b>Other provisions (according to Article 14(7) of Regulation 470/2009)</b>
	species except bovine, ovine, caprine, porcine and poultry	200 200	Liver Kidney	
Deltamethrin	Finfish	10	Muscle and skin in natural proportions	
Dicloxacillin	All food-producing species	300 300 300 300	Muscle Fat Liver Kidney	*
Difloxacin	All food-producing species except bovine, ovine, caprine and poultry	300 100 800 600	Muscle Fat Liver Kidney	*
Diflubenzuron	Salmonidae	1000	Muscle and skin in natural proportions	
Emamectin	Fin fish	100	Muscle and skin in natural proportions	
Enrofloxacin	All food-producing species except bovine, ovine, caprine, porcine, rabbits and poultry	100 100 200 200	Muscle Fat Liver Kidney	*
Erythromycin	All food producing species	200 200 200 200 150	Muscle Fat Liver Kidney Eggs	*
Florfenicol	Fin fish	1000	Muscle and skin in natural proportions	

<b>This list is adapted from Table 1 of Commission Regulation (EU) 37/2010</b>				
<b>Pharmacologically active substance(s)</b>	<b>Animal species</b>	<b>MRLs (µg/kg)</b>	<b>Target tissues</b>	<b>Other provisions (according to Article 14(7) of Regulation 470/2009)</b>
Flumequine	Fin fish	600	Muscle and skin in natural proportions	
Framycetin - see neomycin				
Isoeugenol	Fin fish	6.000	Muscle and skin in natural proportions	
Kanamycin	All food-producing species except fin fish	100 100 600 2500	Muscle Fat Liver Kidney	
Lincomycin	All food-producing species	100 50 500 1500 50	Muscle Fat Liver Kidney Eggs	*
Neomycin (including framycetin)	All food-producing species	500 500 500 5.000 500	Muscle Fat Liver Kidney Eggs	*
Oxacillin	All food-producing species	300 300 300 300	Muscle Fat Liver Kidney	*
Oxolinic acid	All food producing species	100 50 150 150	Muscle Fat Liver Kidney	*
Oxytetracycline	All food-producing species	100 300 600 200	Muscle Liver Kidney Eggs	*
Paromomycin	All food-producing species	500 1500 1500	Muscle Liver Kidney	* Not for use in animals from which milk or eggs are produced for human

<b>This list is adapted from Table 1 of Commission Regulation (EU) 37/2010</b>				
<b>Pharmacologically active substance(s)</b>	<b>Animal species</b>	<b>MRLs (µg/kg)</b>	<b>Target tissues</b>	<b>Other provisions (according to Article 14(7) of Regulation 470/2009)</b>
				consumption.
Phoxim	All food-producing species except fin fish.	25 550 50 30 60	Muscle Fat Liver Kidney Eggs	*
Sarafloxacin	Salmonidae	30	Muscle and skin in natural proportions	Not for use in animals from which eggs are produced for human consumption.
Spectinomycin	All food producing species	300 500 1.000 5.000	Muscle Fat Liver Kidney	* Not for use in animals from which eggs are produced for human consumption.
Sulphonamides (all substances belonging to the sulphonamide group)	All food-producing species	100 100 100 100	Muscle Fat Liver Kidney	* The combined total residues of all substances within the sulphonamide group should not exceed 100 µg/kg. Not for use in animals from which eggs are produced for human consumption.
Teflubenzuron	Salmonidae	500	Muscle and skin in natural proportions	
Tetracycline	All food-producing species	100 300 600 200	Muscle Liver Kidney Eggs	*
Thiamphenicol	All food producing species	50 50 50 50	Muscle Fat Liver Kidney	* Not for use in animals from which eggs are produced for human consumption.
Tilmicosin	All food	50	Muscle	*

<b>This list is adapted from Table 1 of Commission Regulation (EU) 37/2010</b>				
<b>Pharmacologically active substance(s)</b>	<b>Animal species</b>	<b>MRLs (µg/kg)</b>	<b>Target tissues</b>	<b>Other provisions (according to Article 14(7) of Regulation 470/2009)</b>
	producing species	50 1000 1000	Fat Liver Kidney	Not for use in animals from which eggs are produced for human consumption.
Trimethoprim	All food producing species except equidae	50 50 50 50	Muscle Fat Liver Kidney	* Not for use in animals from which eggs are produced for human consumption.
Tylosin	All food producing species	100 100 100 100 200	Muscle Fat Liver Kidney Eggs	*

\*For finfish, the muscle MRL relates to “muscle and skin in natural proportions”; MRLs for fat, liver and kidney do not apply to finfish.

## ANNEX 10

**Note:** This annex reflects current European Union's Commission Decisions 2004/25/EC and 2003/181/EC of April 2014. The information contained within this annex is subject to change and it is the obligation of the producer to ensure compliance with current regulations and guidelines.

### European Union Veterinary Residues: Additional Information Regarding Banned Veterinary Drugs.

For several substances which have been expressly prohibited from use in food producing animals in the EU (e.g., chloramphenicol, nitrofurans), or not authorised (e.g., malachite green), the concept of the minimum required performance limit (MRPL) has been established ([Commission Decision 2002/657/EC](#)).

MRPLs are defined as “minimum content of an analyte in a sample, which at least has to be detected and confirmed” and are the reference point for action in relation to the evaluation of consignments of food ([Commission Decision 2005/34/EC](#)).

To date, MRPLs have been established for the following substances:

Substance and/or metabolite	Matrices	MRPL	Reference
Chloramphenicol	Aquaculture products	0,3 µg/kg	<a href="#">Commission Decision 2003/181/EC</a>
Nitrofurans metabolites: - furazolidone - furaltadone - nitrofurantoin - nitrofurazone	Aquaculture products	1 µg/kg	
Sum of malachite green and leucomalachite green	Meat of aquaculture products	2 µg/kg	<a href="#">Commission Decision 2004/25/EC</a>

With regard to each of these EU limits/levels, Member States are required to ensure that they have validated laboratory analytical methods in place which are capable of meeting these thresholds



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সংস্করণ পত্রিকা, অতিরিক্ত, পৃষ্ঠা ১৫, ২০১৫

ক্রমিক নং	প্রাথমিক পর্যায়ে নাম	সর্বোচ্চ মাত্রা
(২)	প্লেড (Plumbum)	(অ) ০.৫০ মি.গ্রাম/কেজি বায়ু পানির মাত্রা; (আ) ০.৫০ মি.গ্রাম/কেজি সামুদ্রিক মাত্রা; এবং (ই) ০.৫০ মি.গ্রাম/কেজি ক্রোমিয়ামমস।
(৩)	হাইড্রজার্ম (Hydrargyrum)	(অ) ০.৫০ মি.গ্রাম/কেজি বায়ু পানির মাত্রা; (আ) ১.০০ মি.গ্রাম/কেজি সামুদ্রিক মাত্রা; এবং (ই) ০.৫০ মি.গ্রাম/কেজি ক্রোমিয়ামমস।
(৪)	ক্রোমিয়াম (Chromium)	(অ) ১.০০ মি.গ্রাম/কেজি বায়ু পানির মাত্রা; (আ) ১.০০ মি.গ্রাম/কেজি সামুদ্রিক মাত্রা; এবং (ই) ১.০০ মি.গ্রাম/কেজি ক্রোমিয়ামমস।
(৫)	আর্সেনিক (Arsenic)	(অ) ৫.০০ মি.গ্রাম/কেজি বায়ু পানির মাত্রা; (আ) ৫.০০ মি.গ্রাম/কেজি সামুদ্রিক মাত্রা; এবং (ই) ৫.০০ মি.গ্রাম/কেজি ক্রোমিয়ামমস।
(৬)	কপার (Cuprum)	(অ) ৫.০০ মি.গ্রাম/কেজি বায়ু পানির মাত্রা; (আ) ৫.০০ মি.গ্রাম/কেজি সামুদ্রিক মাত্রা; এবং (ই) ৫.০০ মি.গ্রাম/কেজি ক্রোমিয়ামমস।
(৭)	জিঙ্ক (Zinc)	(অ) ৫০.০০ মি.গ্রাম/কেজি বায়ু পানির মাত্রা; (আ) ৫০.০০ মি.গ্রাম/কেজি সামুদ্রিক মাত্রা; এবং (ই) ৫০.০০ মি.গ্রাম/কেজি ক্রোমিয়ামমস।

স্বাক্ষরিত এবং সীলিত করা হয়েছে।

রাষ্ট্রপতির আদেশক্রমে

মোঃ মুহিবুলআমিন

নিমিত্ত সহকারী সচিব।

মোঃ আজগল ইসলাম (উপসচিব), উপপরিচালক, বাংলাদেশ সরকারি প্রকাশন, ঢাকা কর্তৃক মুদ্রিত।  
আবদুর রশিদ (উপসচিব), উপপরিচালক, বাংলাদেশ ককম ও প্রকাশনা অফিস,  
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