UNOFFICIAL TRANSLATION

MINISTERIAL REGULATION

ON THE ESTABLISHMENT OF THAI AGRICULTURAL STANDARD ON GOOD AQUACULTURE PRACTICES FOR HATCHERY OF DISEASE FREE PACIFIC WHITE SHRIMP (*Litopenaeus vannamei*) AS A MANDATORY STANDARD

B.E. 2559 (2016)

By virtue of Section 5 paragraph one and Section 15 paragraph two of the Agricultural Standards Act, B.E. 2551 (2008), the Minister of Agriculture and Cooperatives hereby issues this Ministerial Regulation as follows:

Section 1 This Ministerial Regulation shall come into force after two hundred and seventy days as from the date of its publication in the Royal Gazette.

Section 2 The Thai Agricultural Standard TAS 7432-2015 in accordance with the Notification of the Ministry of Agriculture and Cooperatives on the Establishment of Thai Agricultural Standard : Good Aquaculture Practices for Hatchery of Disease Free Pacific White Shrimp (*Litopenaeus vannamei*) under the Agricultural Standards Act, B.E. 2551 (2008) dated on 21 September B.E. 2558 (2015) shall be established as a mandatory standard.

Given on the 5th September B.E. 2559 (2016)

(General Chatchai Sarikalya)
Minister of Agriculture and Cooperatives

Remark : Rationale for the promulgation of this Ministerial Regulation is that : Culture of the Pacific white shrimp in Thailand has confronted with the problem on diseases, in particular, the acute heptatopancreatic necrosis disease (AHPND) in the larval and postlarval Pacific White Shrimp. This causes loss to farmers. Thereof a control of *Litopenaeus vannamei* nauplius production is required in order to prevent disease transmitted from bloodstock to the nauplii and control the spread of disease throughout aquaculture area, by establishing requirements on good aquaculture practices for *Litopenaeus vannamei* nauplius production. The Notification of the Ministry of Agriculture and Cooperatives on the Establishment of Thai Agricultural Standard on Good Aquaculture Practices for Hatchery of Disease Free Pacific White Shrimp (*Litopenaeus vannamei*) has been established under the Agricultural standard Act. B.E. 2551 (2008), dated 3rd November 2557 (2014), followed by public hearing from stakeholders in accordance with Section 18 of the Agricultural standard Act B.E. 2551 (2008). It is deemed necessary to establish the Thai Agricultural Standard: Good Aquaculture Practices for Hatchery of Disease Free Pacific White Shrimp (*Litopenaeus vannamei*) as a mandatory standard.

THAI AGRICULTURAL STANDARD

GOOD AQUACULTURE PRACTICES FOR HATCHERY OF DISEASE FREE PACIFIC WHITE SHRIMP (*Litopenaeus vannamei*)

1. SCOPE

1.1 This Thai Agricultural Standard covers hatchery producing Pacific white shrimp *Litopenaeus vannamei* nauplii.

1.2 This Thai Agricultural Standard establishes requirements on good aquaculture practices for *Litopenaeus vannamei* nauplius production, covering from broodstock receiving up until shrimp nauplii ready to be moved from the hatching pond or other hatching containers, in order to obtain *Litopenaeus vannamei* nauplii free from target diseases.

2. DEFINITIONS

For the purpose of this standard:

2.1 Pacific white shrimp means a marine shrimp of the scientific name of *Litopenaeus vannamei* or any recognised synonyms.

2.2 Pacific white shrimp at nauplius stage means shrimp larvae after hatching and before entering into zoeal stage.

2.3 Pacific white shrimp broodstock means sexually mature shrimp that are collected, reared, or imported for breeding purposes.

2.4 Disease free Pacific white shrimp means Pacific white shrimp broodstock and nauplii that are free of the diseases listed in Annex A.

2.5 Pacific white shrimp hatchery means premises specifically used to produce Pacific white shrimp nauplii such as a production office, water pumping station, water preparation ponds, water storage facility, air blower station, quarantine area, natural feed culturing area, broodstock house, nauplius production house, packing area, and effluent water treatment system.

2.6 Natural feed means live animals or plants, including animal parts or plant parts that have not been processed and can be used to feed Pacific white shrimp broodstock.

2.7 Formulated feed means instant pre-mixed aquatic animal feed as defined under the Animal Feed Quality Control Act B.E.2525 (1982) and its amendments.

3. REQUIREMENTS

Pacific white shrimp hatchery shall follow the requirements as specified in Table 1.

Table 1 Requirements

Items	Requirements
1. Production principles	1.1 Availability of Standard Operating Procedures of hatchery to control target diseases. Standard Operating Procedures shall be implemented accordingly. 1.2 Targeted surveillance of the Department of Fishery shall be participated. 1.3 Availability of surveillance report showing that the hatchery is free of the target diseases for at least six consecutive months, except for a newly operating hatchery. However, such hatchery shall obtain inspection report showing the absence of target diseases.
2. Personnel	2.1 The operators in nauplius hatchery shall obtain knowledge, training and/or experience in Pacific white shrimp hatchery operations. 2.2 Control measures for personnel and visitors that may be the carrier of target diseases into the hatchery shall be in place.
3. Selection of disease free Pacific white shrimp broodstock	3.1 Select target disease free Pacific white shrimp broodstock. Their source shall be traceable. 3.2 Availability of effective quarantine system for Pacific white shrimp broodstock.
4. General management	4.1 Availability of an operating manual for Pacific white shrimp hatchery. Operating manual shall be implemented accordingly. 4.2 Closed housing operation shall be applied to Pacific white shrimp broodstock, nauplius production and disease quarantine areas. 4.3 Tools, equipment and systems used for each house shall be clearly separated and properly disinfected according to the technical methods before and after the use of each batch of broodstock. 4.4 Water used in the hatchery shall be of suitable quality or properly adjusted to the suitable quality for Pacific white shrimp nauplius production. Prevention of disease carriers from the water shall be implemented. Disinfection of water used in hatching and transporting shall be in accordance with technical methods. 4.5 Vehicle shall be disinfected at the hatchery entry and exit. 4.6 Pest shall be controlled and prevented from the production areas of the hatchery.

Items	Requirements
	4.7 No pet is allowed in the production areas of the hatchery. 4.8 Rubbish and waste shall be collected and discarded hygienically to prevent cross contamination. 4.9 Waste from bathroom and toilet shall be discarded hygienically. The contamination of such waste to the water system shall be prevented.
5. Feed management for Pacific white shrimp broodstock	5.1 Registered formulated feed in accordance with the Animal Feed Quality Control Act B.E.2525 (1982) and its amendments which is not deteriorated shall be used. Nevertheless, on farm and/or natural feed hygienically prepared and stored may be used. Inspection report for such on farm and/or natural feed indicating the absence of target diseases or risk mitigation method of target diseases shall be available. 5.2 Feed shall be kept in a secure place that is able to prevent contamination and keep the quality of the feed.
6. Pacific white shrimp health management	6.1 Measures shall be in place to prevent and control disease spreading within hatchery and from hatchery to outside. 6.2 Inspection report of shrimp random sampling indicating the absence of the target diseases shall be available. The broodstock shall be free of the diseases listed in Sections A.1 - A.6, Annex A. Shrimp nauplii shall be free of the disease described in Section A.6, Annex A. 6.3 In case abnormal mortality is found and target diseases are suspected, disease transmission shall be controlled and relevant competent authority shall be immediately informed.
7. Records	7.1 Record the production process and keep for at least three years.

ANNEX A

TARGET DISEASES

The target diseases are as follows:

A.1 White spot disease is a disease occurs in marine shrimp caused by White Spot Syndrome Virus (WSSV). The infected shrimps usually have white spots or rings under the exoskeleton on the carapace (cephalothorax), abdomen (body) and base of the tail. Occasionally, red to pinkish discoloration may also appear on the abdomen. The disease can cause rapid mortality in cultured shrimp.

A.2 Yellow head disease is a disease occurs in marine shrimp caused by Yellow Head Virus (YHV). The infected shrimps usually have yellowish coloration of the cephalothorax due to the discoloration of gill and hepatopancrease to pale and yellow colour. The disease can cause rapid mortality in cultured shrimp.

A.3 Taura Syndrome (TS) is a disease occurs in marine shrimp caused by Taura Syndrome Virus (TSV). The disease is often found in Pacific white shrimp. The clinical signs are usually dark red markings, especially on the tail and appendages. Sometimes, the disease may cause death. In case infected shrimps survive, advanced stage occurs with the black markings of ambiguous shape presented on the shell.

A.4 Infectious Hypodermal and Haematopoietic Necrosis Virus disease (IHHNV) is a disease occurs in marine shrimp caused by parvovirus so called Infectious Hypodermal and Hematopoietic Necrosis Virus (IHHNV). The infected shrimps usually have irregular and slow growth, cuticular deformities, bended rostrum, and fragile, misshape antennae. Mortality rate is low. Non-uniformity of shrimp size is commonly found in the affected crop.

A.5 Infectious Myonecrosis (IMN) is a disease occurs in marine shrimp caused by Infectious Myonecrosis Virus (IMNV). The clinical signs of infected shrimp are white discoloration of the muscle at the last abdominal segment which may spread to the other segments. Necrosis of muscle cells occurs and orange discoloration of the muscle like boiled shrimp may appear.

A.6 Early Mortality Syndrome (EMS) or Acute Hepatopancreatic Necrosis Disease (AHPND) is a disease occurs in marine shrimp caused by the infection of virulent strain of *Vibrio parahaemolyticus.* The infected shrimps usually show signs of hepatopancrease shrinkage and reduction of fat droplets within the hepatopancrease.