

JIFSAN Good Aquacultural Practices Program

HACCP Application in Shrimp Hatchery Operations



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Hatchery-related Critical Control Points (CCPs) include brood stock acquisition, influent water, brood stock feeds, and live feeds.

Brood stock acquisition (CCP) are used to identify when shrimp may contain Listed Specific Pathogens (LSPs). A Certificate of Compliance (COC) assures that at the time of inspection, the product tested is found to be in compliance with stipulated requirements. A COC for Specific Pathogen Free (SPF) certification is required for each shipment of brood stock received. A Critical Limit (CL) is a maximum or minimum level that is established for monitoring of each CCP. A CL in brood stock receipt is the presence of an appropriate COC. A Corrective Action (CA) is an action that must be taken when monitoring of a CCP indicates a CL has been exceeded. With regard to brood stock receipt, without a COC, the CA is either rejection of the shipment, or placement of the brood stock into quarantine.

A second brood stock acquisition (CCP) is when shrimp may contain LSPs. During brood stock quarantine, brood stock should be tested for LSPs. In addition, a sentinel program whereby individual animals are isolated under stress should be implemented. These sentinel animals should subsequently be tested for LSPs. Brood stock quarantine monitoring tests brood stock for LSPs. Critical Limit is satisfied when there are no detectable LSPs on shrimp. If LSP is positive, then

Example of LSPs

Taura syndrome (TSV)
White Spot disease (WSV) (WSSV)
Yellow Head disease (YHV)
Infectious Hypodermal and
Haematopoietic Necrosis (IHHN)

- you must destroy the quarantined animals and
- disinfect the quarantine facility. Implementation
- of a sentinel program includes monitoring brood
- stock for LSPs.
- Influent water for the hatchery is considered a CCP
- because this water may contain LSPs. No detectable
- LSPs should be in the water. Influent water should
- be appropriately sterilized, dosages monitored,
- and repeated if dosages are not achieved. Conduct
- periodic testing of water for detectable LSP. If LSPs
- are detected, disinfection of incoming water with:
- (100 ppm sodium hypochlorite for 10 minutes);
- UV (90,000 uw/cm² for 60 minutes); or ozone (0.5
- ug/ml for 10 minutes). Monitor chlorine levels,
- UV bulb, ozone concentration, and contact times.
- Repeat if dosages are not achieved.
- After implementation of the sentinel program, if
- monitoring of shrimp for LSPs is positive, review
- entire water treatment process.
- Brood stock feed is a CCP because feed ingredients
- may contain LSPs. COCs are required for all
- ingredients possibly containing LSPs. Periodic
- testing of feed supplies for LSPs should be
- conducted, as well as periodic reviews of records
- and COCs from suppliers. Review the COC for
- every shipment. If there is no COC, reject the
- shipment. Test the feed periodically for LSPs, and
- review the records of the supplier on a regular
- basis. If LSPs are detected in the feed, disinfect the
- live feeds production facility. Verify certificate of
- compliance (COC) from suppliers to maintain
- LSP-free feed products.

Hatchery-Related Standard Operating Procedures (SOPs)

- Standard Operating Procedures (SOPs) are written
- practices and procedures designed to enhance
- production and product quality and safety. SOPs
- for the hatchery are identified for the control of
- human and animal disease vectors as well as for
- facility/equipment disinfection.

Verification records: Brood stock acquisition

Verification	Record
No LSP from brood stock supplier	Facility SPF certification
Review of shrimp receipt and shipping records	SPF records for each shipment
Periodic brood stock supplier site visit	Record of site visit
Periodic review of protocols from supplier	Facility protocol records
Testing of shrimp for LSPs	Analytical test records
Sentinel system	Sentinel testing records

Verification records: Hatchery shrimp feed

Verification	Record
Detectible LSP-free feed history	COC forms from shipments
Periodic site visits	Site visit records
Periodic review of feed shipment receipt records	Record of site visit
Periodic review of protocols from supplier	COC forms from all shipments
Periodic testing of feeds for detectible LSPs	Analytical test records
Sentinel system	Sentinel testing records

Verification records: Hatchery water supply

Verification	Record
Verification of disinfection records	Treatment dosage from each batch
Check calibration records	Records for all equipment used
Periodic testing of feeds for detectible LSPs	Analytical test records
Sentinel system	Sentinel testing records

Control of Human Disease Vectors (SOP)

Humans may transfer LSPs. SOPs for control of human disease vectors include limiting personnel access, appropriate entry and exit disinfection, employee training and record keeping, and maintenance of facility access and disinfection records.

Control of Animal Disease Vectors (SOP)

Animals may also transfer LSPs. Appropriate SOPs for control of animal disease vectors include fencing, animal excluder devices, employee training programs, maintenance of fencing and animal excluder inspections.

Disinfection of Facilities And Equipment (SOP)

Disinfection of facilities and equipment are hatchery SOPs because facilities and equipment may transfer LSPs. These SOPs include tank and equipment disinfection, and maintenance of employee training records and disinfection records. Chlorinate (100 ppm sodium hypochlorite for 10 minutes) and dry hatchery and live feeds production tanks between production runs. Sterilize all equipment in dips (100 ppm sodium hypochlorite for 10 minutes). Maintain and test concentrations. Maintain employee training programs and records thereof. Maintain records of all disinfection treatments.

References

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Operational flow diagram

