

Hatchery Post Larvae Yield and Health in Vannamei Shrimp

Background

Vietnam is among the world leaders in shrimp production. In all countries and food production, key environmental pressures and management practices can have both positive and negative impacts on the overall production. In Vietnam and other shrimp producing countries, producers face water quality and disease issues which impact their production and profits.

Ensuring the quality of hatchery raised Post Larvae (PL's) is a critical step and a major component toward improving overall shrimp production. To achieve optimal production, hatchery PL's must be strong, healthy and disease free.

Shrimpveter Laboratory is a Vietnam Nong Lam University Department of Aquaculture Pathology independent 3rd party researcher. BiOWiSH Technologies employed Shrimpveter Laboratories to evaluate the impact of BiOWiSH™ products and practices on Vannamei shrimp production.

Objectives

The objective of this study was to determine if adding BiOWiSH™ AquaFarm and BiOWiSH™ MultiBio 3PS to shrimp production management practices helps maintain optimal water quality and establishes a healthy gut microbiome that suppresses problematic Vibrio growth, resulting in stronger Vannamei shrimp PL's.

Solution

Addition of BiOWiSH™ AquaFarm directly to tank water controls and reduces ammonia and nitrite that can form, or surge unexpectedly, in tank water during various growth stages of hatchery production. BiOWiSH™ AquaFarm also helps maintain healthy populations of beneficial heterotrophic bacteria during hatchery production while controlling the levels of both yellow and green Vibrio in tank water.

Addition of BiOWiSH™ MultiBio 3PS to hatchery feed promotes improved gut and immune health in post larvae inhibiting Vibrio growth in the gut microbiome, and improving PL health and survivability.



Results:

BiOWiSH™ AquaFarm and BiOWiSH™ MultiBio 3PS:

1. Quickly reduced and controlled ammonia and / or nitrite increases in tank water during production.
 - Reduced ammonia surges in total nitrogen from 1 ppm to 0.2 ppm in 24 hours.
 - Reduced nitrite surges from 0.3 ppm to nondetectable levels in 24 hours.
2. Maintained healthy populations of beneficial bacteria in tank water during hatchery production.
 - Supported and maintained a healthy population of heterotrophic beneficial bacteria (10^5 to 10^6 cfu/mL).
3. Controlled and suppressed problematic Vibrio growth during hatchery production.
 - Controlled Yellow Vibrio populations during production to $<10^2$ to 10^4 cfu/mL, and reduced population surges that can occur during production stages in as short as 24 hours.
 - Controlled Green Vibrio to $<10^1$ or less, and reduced population surges that can occur during production stages in as short as 24 hours.
 - Luminous Vibrio (nondetectable).

Conclusion

According to the study results BiOWiSH™ products dramatically improved water quality, maintained a healthy population of heterotrophic beneficial bacteria, and suppressed problematic Vibrio. Addition of the BiOWiSH™ products were simple and does not cause a disruption to common management practices.

Instituting BiOWiSH™ products into the hatchery phase improves the survivability and growth of PL's when they are moved to the next production stages



Implementation Program

Test Design Details:

- From Nauplii to Early Mysis: BiOWiSH™ AquaFarm is dosed at 4 ppm
 - From Mysis to PL12: BiOWiSH™ AquaFarm is dosed at 8 ppm
 - BiOWiSH™ MultiBio 3PS is dosed at 1 ppm
 - Artemia enrichment with BiOWiSH™ AquaFarm at 5 ppm
- 1,000,000 Nauplii stocked in 5000 L tank (200 Nauplii/L)
 - 3 replicate tanks at each treatment
- Two growing phases. Once shrimp larvae reach PL1-2, they are transferred to a second rearing tank in order to reduce organic matter accumulation.
- Commercial Grade Feed; 4 feeding times per day
- BiOWiSH™ AquaFarm is added directly in water daily.
 - BiOWiSH™ MultiBio 3PS is daily added in feed.
 - Prior to Nauplius stocking for 6-8 hours, BiOWiSH™ AquaFarm is also applied to culture water to create good buffer for larvae. The products are added in the morning after sunrise.
- Test Duration: Nauplii to PLs 10-12



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