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Impacts of acute hepatopancreatic necrosis syndrome



1 May 2013 Stephen G. Newman, Ph.D.



Short-term market dynamics affect long-term practices



Although APHNS/EMS may continue to spread, as with other diseases affecting farmed shrimp, there will likely be a moderation of impacts in years to come.

Few of those involved in the shrimp-farming industry are not familiar with acute hepatopancreatic necrosis syndrome (AHPNS), also known as early mortality syndrome (EMS). The disease has been well characterized, and it has been suggested that the early damage to the shrimp is a result of some form of hepatotoxic material. Work under way to determine the cause will hopefully result in a solid idea about how the problem can be controlled.

Meanwhile, the specter of the disease is weighing very heavily on global shrimp markets. Prices are up, with serious drops in production in the world's leading shrimp-farming countries. There are concerns that, with no immediate solutions in sight, the problem will continue to spread and further erode the stability of the market.

Disease part of aquaculture

As most knowledgeable aquaculturists know all too well, disease is a natural component of aquaculture. Some outside the sector use this fact to try to defame aquaculture as being environmentally disruptive and essentially non-sustainable. However, the absence of disease is unnatural, and there are no agricultural practices that do not, at the very least, occasionally suffer from the impacts of disease.

While it should be the goal of all science-based aquaculture to prevent diseases to the maximum extent possible, the unfortunate truth is that this ideal is not achievable or perhaps even ultimately desirable. Even those production systems that minimize the variables and optimize production are prone to disease outbreaks, and each environment can create conditions that allow what may not have been pathogens under some circumstances evolve into pathogens.

An ideal production environment would be one in which animals were not prone to stressors that impact their integral physiologic mechanisms. These do not exist, however, and while genetic selection will allow the production of animals that tolerate stressors without noticeable negative impacts, we are still in many respects in the early stages of shrimp domestication. We can expect to continue to see periodic widespread disease outbreaks, but with the hope they will become less frequent as we learn how to operate in a truly sustainable manner.

As more is understood about the nature of AHPNS, we will be able to more narrowly define what actually constitutes this disease. Many farmers experience mortality post-stocking, which can be the result of many different issues. AHPNS results in a classic pathology, which must be present to define the disease process. It is clear that secondary pathogens may play a role in the ultimate death of affected animals.

Disease spread

Controlling the underlying cause may not be simple or straightforward – and we will not know until the cause is identified what will turn out to be the case. There is little reason to believe the disease will suddenly become self-limiting. It appears to be spreading in a slow and inexorable manner. This does not bode well for the short-term prospects of limiting its impacts without significant paradigm changes.

Anecdotal observations suggest that stocking animals at much larger sizes, which would entail the widespread use of nursery systems, can stave off the worst part of the problem, although some claim to see impacts on larger shrimp, as well. Others report that polyculture with fish can also lessen AHPNS impacts.

The scientific veracity of these observations has yet to be proven. It is likely that unless drastic steps are taken to stop the disease progression geographically, we may see AHPNS move into areas that probably are currently free of it. It remains to be seen how much a barrier the Pacific Ocean will be in keeping farms in the Americas free of the disease.

Effects on industry

In the interim, since a large portion of the global farmed shrimp crop originates from a handful of Asian countries, we can expect to continue to feel the impacts of AHPNS in the marketplace. Prices will likely continue to increase as the supply fails to meet the demand, and the production dynamics will shift, as they have in the past due to other diseases. What remains to be seen is whether this will result in long-term changes in production paradigms and to what extent new shrimp-producing areas will be developed.

In many parts of the world, shrimp farming has the potential for significant growth, and the temptation will be for it to occur without stringent regulation. While this may alleviate short-term supply issues, it is not likely to change the nature of shrimp farming in the long run.

Poverty-driven farming has been a component of shrimp culture for many years, and while the industry is slowly evolving away from this, the temptations for underdeveloped nations with aquatic resources to allow unregulated development are still strong. Such expansion could set off a new round of diseases and other problems, as well.

Perspectives

Unfortunately, it appears the lessons learned from coping with prior disease outbreaks have not been particularly useful in preventing this problem. The author believes that EMS/AHPNS is here to stay, and we have yet to see its full impacts. It will continue to spread, but as with other diseases affecting farmed shrimp, there will likely to be a moderation of the impacts in years to come.

(Editor's Note: This article was originally published in the May/June 2013 print edition of the Global Aquaculture Advocate.)

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