# AQUAINTECH Inc.

*Consulting for Sustainable Aquaculture*

## The real impact of Early Mortality Syndrome (EMS) or Acute Hepatopancreatic Necrosis Syndrome (AHPNS)

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Few of those involved in the shrimp farming industry are not familiar with this disease. 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 is underway to determine the cause and hopefully (optimistically) will result in a solid idea about how the problem can be controlled. Meanwhile the specter of the disease is weighing very heavily on the global shrimp markets. Prices of shrimp are up with serious drops in production in the worlds leading shrimp farming countries and there are concerns that, with no immediate solutions in sight, the problem will continue to spread, further eroding the stability of the market.

As most knowledgeable aquaculturists know all too well, disease is a natural component of aquaculture. There are some who use this fact to try and trash 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 suffer on occasion from the impact 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 nor perhaps even ultimately desirable. Even those production systems that minimize the variables and optimize production are prone to disease outbreaks and each environment will create conditions that can allow what may not have been pathogens under some circumstances to evolve into pathogens. An ideal production environment would be one in which animals were not prone to stressors that impact the animals integral physiologic mechanisms. These do not exist and while genetic selection (and manipulation) will allow the production of animals that tolerate many of these 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 wide spread disease outbreaks with the hope being that they will become less frequent as we learn how to operate in a truly sustainable manner.

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

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Controlling the underlying cause may not be simple or straightforward and we will not know until the underlying cause is identified if this turns out to the case. There is little reason to believe that this disease will suddenly become self-limiting. It appears to be spreading in a slow and inexorable manner and this does not bode well for the short-term prospects of limiting its impact at least not 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 there are some who claim to see the impact on larger shrimp as well. There are reports that poly-culture, at least with fish, can also lessen the impact. 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 that we may see the disease moving into areas that are currently (probably) free of it. It remains to be seen how much of a barrier that the Pacific Ocean will be in keeping farms in the America's free of the disease.

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 impact of this disease in the market place. Prices will continue to increase as the supply fails to meet the demand and the production dynamics shift as they have in the past due to other diseases. What remains to be seen is whether or not this will result in long term changes in production paradigms and to what extent new shrimp producing areas will be developed. There are many parts of the world where shrimp farming has the potential for significant growth and the temptation will be for it to occur without stringent regulation. While this may alleviate the short-term supply issues it is not likely that it will do much to change the nature of shrimp farming in the long run. Poverty driven farming has been a component of shrimp farming for many years and while the industry is slowly evolving away from this, the temptations are still very strong for underdeveloped nations with the aquatic resources to allow unregulated industry to develop. This will likely set off a new round of diseases and other problems as well.

I believe that this disease is here to stay and that we have yet to see its full impact. It will continue to spread. However, as with all other diseases affecting farmed shrimp, there is likely to be a moderation of the impact in years to come. Unfortunately it does not appear that the lessons that have been learned from coping with prior disease outbreaks have been particularly useful in preventing this problem and it is likely that we will continue to see widespread disease outbreaks in the years to come.

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