

NACA/DAFF Asia Pacific Emergency Regional Consultation on shrimp early mortality syndrome (EMS) / acute hepatopancreatic necrosis syndrome (AHPNS)

An emergency regional consultation on "Early Mortality Syndrome" of shrimp, or Acute Hepatopancreatic Necrosis Syndrome, concluded on Friday, 10th of August 2012, in Bangkok, Thailand. The consultation brought together over 87 participants including international shrimp health experts, regional governments and industry to share information on this emerging disease, its occurrence, pathology and diagnosis, and to develop a coordinated regional response to the issue. The consultation was jointly organised by NACA, an intergovernmental organization of 18 governments in Asia Pacific and Department of Agriculture, Fisheries and Forestry (DAFF), Australia. The AHPNS news story as well as the audio recordings of 19 technical presentations are available at the following links:

http://www.enaca.org/modules/news/article.php?article_id=1952

<http://www.enaca.org/modules/podcast/programme.php>

Early mortality syndrome or AHPNS?

Heavy mortalities during the early stages of a shrimp crop are not unusual and there are a variety of management and pathogen related factors that can cause such losses, which are often described by the catch-all term "early mortality syndrome".

However, in 2009 a new and distinctive pattern of mortalities began to be noticed, affecting both *Penaeus vannamei* and *P. monodon*. The syndrome involves mass mortalities of up to 100% during the first 20-30 days after stocking. Affected shrimp consistently show an abnormal hepatopancreas, which may be shrunken, swollen or discoloured; loose shells, corkscrew swimming, pale colouration and slow growth. Given that these symptoms appear to be distinctive, the name "acute hepatopancreatic necrosis syndrome" has been proposed as a more appropriate term, to distinguish this condition from other causes of early mortalities.

The syndrome was first reported from China and Vietnam in 2010 followed by Malaysia in 2011, and in 2012 it has also been reported in Thailand. The syndrome has caused severe economic losses throughout the region. The cause is not yet known.

A case definition for AHPNS

Reporting of AHPNS has been confounded by the lack of a clear case definition, which has led to many different disease problems being incorrectly reported as "EMS". Prof. Don Lightner proposed the following animal level case definition for AHPNS, which was generally agreed on by the consultation:

- Idiopathic - no specific disease causing agent (infectious or toxic) has been identified.
- Pathology: Acute progressive degeneration of hepatopancreas from medial to distal with dysfunction of B, F, R and E cells, prominent karyomegaly and necrosis and sloughing of these tubule epithelial cells. The terminal stage shows marked inter- and intra-tubular

hemocytic inflammation and development of secondary bacterial infections that occur in association with necrotic and sloughed hepatopancreas tubule cells.

At the pond level, the following clinical signs could be used for presumptive diagnosis which can be further confirmed by histopathology at the animal level

- Often pale to white within HP connective tissue capsule.
- Significant atrophy of HP.
- Often soft shells and partially full to empty guts.
- Black spots or streaks within the HP sometimes visible.
- HP does not squash easily between thumb & finger.
- Onset of clinical signs and mortality starting as early as 10 days post stocking
- Moribund shrimp sink to bottom.

For a more thorough discussion of the case definition and research progress on the causes of AHPNS, please listen to Prof. Lightner's presentation Characterisation, distribution, impacts and case definition. A 'disease card' including diagnostic information and photographs is in preparation and will be made available for download shortly.

Looking for the cause

While the apparent spread of AHPNS throughout the region suggests an infectious or at least biological agent may be involved, thus far, laboratory challenge tests have failed to demonstrate that the disease is transmissible and no infectious agent or toxin has been identified. Testing of feeds from affected farms and two crustaceicides including cyromethrin have similarly failed to reproduce the disease. At this stage the cause is unknown, and the possibility of an infectious agent or toxin cannot be discounted.

For a detailed discussion, please listen to Prof. Tim Flegel's presentation Research progress on bacterial and viral causes of AHPNS, and Prof. Chalor Limsuwan's presentation Management of EMS – what works and what does not?

Preparing for future

As the emergence or discovery of new diseases is a regular occurrence in aquaculture, the consultation also discussed arrangements to improve response to future disease emergencies. At present, obtaining extra-budgetary funding to deal with a disease emergency often requires lengthy approvals processes and funds may not be granted until the situation is sufficiently 'hot' to persuade administrators of the need.

As successful containment of a disease is only possible during the early stages of an outbreak, participants indicated the need to develop a 'fast response' mechanism that would allow rapid deployment of investigatory or response teams. One possibility proposed was the establishment of a regional emergency aquatic animal disease fund and pre-agreed procedures for activating an investigation or response to be coordinated by a regional mechanism such as NACA

While governments were seen as the main parties responsible for contributing to such a fund, industry representatives indicated they also made substantial private investments in investigating AHPNS and other serious disease issues, and were open to the possibility of contributing to the fund when a need arose.

Our thanks

NACA wishes to sincerely thank the Australian Department of Agriculture, Fisheries and Forestry for funding the emergency consultation, and for their rapid and timely response to this issue, which has been of great assistance to the region. OIE support for the participation of OIE Crustacean disease experts is gratefully acknowledged. Finally NACA wishes to thank all the resource experts, national participants representing the CA and lead research institutions, regional and international organizations and private sector for their contribution to the regional consultation.