



## Outcomes of emergency consultation on shrimp early mortality syndrome / AHPNS

An emergency regional consultation on “Early Mortality Syndrome” of shrimp, or Acute Hepatopancreatic Necrosis Syndrome, concluded on Friday 10 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 and the Australian Department of Agriculture, Fisheries and Forestry.

### 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 2010 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, 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:

**Idiotpathic:** 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



Participants in the Asia-Pacific Emergency Regional Consultation on Shrimp Early Mortality Syndrome / Acute Hepatopancreatic Necrosis Syndrome.

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 hepatopancreas connective tissue capsule.
- Significant atrophy of hepatopancreas.
- Soft shells are often observed along with partially full to empty guts.
- Black spots or streaks within the hepatopancreas are sometimes visible.
- The hepatopancreas does not squash easily between thumb and finger.
- The onset of clinical signs and mortality starting as early as ten days post stocking
- Moribund shrimp sink to the 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 (see links below).

## Looking for the cause

While the apparent spread of AHPNS throughout the region suggests that 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 crustaceacides including cypromethrin 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? (links below).

## 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 with 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 had also made substantial private investments in investigating AHPNS and other serious disease issues, and were open to the possibility of contributing to such a fund when a need arose.

## Disease card, audio recordings and report of the meeting

The following resources are now available for download from the NACA website:

A disease card to assist with field level diagnosis.  
<http://www.enaca.org/modules/wfdownloads/singlefile.php?cid=10&lid=1060>

Audio recordings of the technical presentations, as MP3 files.  
[http://www.enaca.org/modules/podcast/programme.php?programme\\_id=9](http://www.enaca.org/modules/podcast/programme.php?programme_id=9)

The final report of the meeting.  
<http://www.enaca.org/modules/wfdownloads/singlefile.php?cid=11&lid=1059>

## 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 competent authorities and lead research institutions, regional and international organisations and private sector for their contribution to the consultation.

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## Workshop on Aquaculture Planning and Management Tools

A three-day workshop on the Evaluation and Adoption of Aquaculture Assessment Tools in the Asia-Pacific Region was held from 3-5 July in Pattaya, Thailand. The purpose of the workshop was to conduct a regional evaluation study on adoption of existing aquaculture assessment tools in Asia and the Pacific, and to develop a regional strategy to promote wider application of such tools in the region.

The workshop, jointly convened by FAO, NACA and the Asia-Pacific Fisheries Commission (APFIC), was held in

response to recommendations of the APFIC regional consultative workshop on "Strengthening Assessments of Fisheries and Aquaculture in the Asia-Pacific Region for Policy Development and Management" (4-6 October 2011, Yangon, Myanmar). Participants included experts from 9 countries (Australia, China, India, Indonesia, Malaysia, Philippines, Republic of Korea, Thailand and Vietnam), SEAFDEC AQD, OIE Tokyo, the SEAT project and several people from the private sector.





Participants in the Workshop on Evaluation and Adoption of Aquaculture Assessment Tools in the Asia-Pacific Region.

The workshop considered ten country case studies and develop a regional strategy and action plan for promoting wider adoption of aquaculture assessment tools in the Asia Pacific. A regional synthesis document is also in preparation, based on the case studies, and will be published in due course.

## Workshop observations and recommendations

The workshop noted that the current status of aquaculture as a major supplier of fish for food is expecting to become increasingly important into the future. This is particularly the case in Asia, where a growing population, economic development and stagnant capture fisheries will increasingly require aquaculture production to fill the demand for fish. Aquaculture must achieve this against a background of increasing competition for land, water, energy and other resources such as fishmeal and fish oil required for feeds. The general trend is towards increasing intensification of aquaculture within existing areas. The workshop identified a number of key risks and concerns that face the sustainability and stability of the aquaculture sector as it consolidates and intensifies into the future:

Loss of market access due to:

- Food safety concerns, residues, contaminants.
- Inability to meet requirements for health certification (e.g. evaluation of competent authority by importing country).
- Technical barriers to trade.
- Negative consumer perception.
- Loss of production or economic impact of:
- Loss of right to use water/land/ environmental service (e.g. restriction of water, zoning).
- Farm closures due to environmental concerns (e.g. inability to meet effluent/impact standards).
- Stock/production losses as a result of environmental impacts.
- Trans-boundary diseases.
- Declining genetic quality of stock.
- Genetic or biodiversity impacts from introduction, movement or escapees.
- Poor economic viability of farms, economic impacts, social impacts.
- Small farmers inability to meet export standards.
- Burden of compliance with certification requirements.
- Rising cost of feeds/energy/labour/ inputs.
- Access to feed ingredients, notably fishmeal and fish oil.

The workshop was informed of the wide range of tools that were being applied in the region and noted that the manner of application is highly context specific. The workshop identified some key considerations relating to the use of tools for planning and management and these can be clustered into four key areas:

- Biosecurity.
- Food safety.
- Environmental and social impact/ protection.
- Animal welfare.

The workshop considered the application of the tools and particularly what action was required at national and regional level to promote wider adoption. The workshop noted that constraints on the effective use of these of the tools were due to:

- Limited incentives and awareness; long term benefits are not immediately apparent to industry/producers.

- Lack of supporting legislation, institutional mainstreaming.
- Financial constraints, cost recovery.
- Lack of capacity and technical skill to apply them.
- Lack of basic methodology or regional minimum requirements (e.g. carrying capacity, genetic risk analysis).
- Constrained access to technical information (e.g. language barrier).
- Ineffective integration between different agencies with responsibilities linked to planning and management.
- Lack of buy-in by producers wary of regulatory controls and potential increased costs.

### Regional recommendations

The workshop concluded that in order to improve the application and coverage of the tools for aquaculture planning and management there were some key support which could be made available at regional level:

- Collate an aquaculture planning and management toolbox for the region. This would be based on existing source materials as well as case material from country specific applications to form a toolbox resource available as an online resource. There are opportunities to learn lessons from development of animal health systems in the region as well as EIA or other tools from other sectors. A regional consensus process would be required to harmonise the minimum requirements of the tools.
- Once tools are identified and available, initiate capacity building and adoption. A comprehensive series of course modules on tools for aquaculture planning, assessment and management will need to be developed, including a regional training course which could be used by training institutions. These training materials would contain generic guidelines.
- Promote/encourage networking for information sharing. Documentation of success stories and best practices in the application of tools relevant to

the context of the region should be undertaken. A review of how tools for planning and management are used may benefit or marginalize small-scale producers.

- Develop a regional support programme. This could be done within the framework of NACA, noting that these capacity development and information sharing needs cross cut three of NACA's core thematic programmes, ie. health, food safety and sustainable aquaculture. Seeking regional support to the programme (including a request to FAO for regional TCP support) should be undertaken as a priority, and the general capacity building issue should be brought to the attention of the NACA Governing Council and APFIC 32nd Session. Member countries should consider raising this as a regional need at the FAO Sub-Committee on Aquaculture and the FAO Committee on Fisheries.

### National recommendations

At the national level the workshop noted that in-country action to improve the use of the tools and their effectiveness would include:

- Scoping of the national aquaculture sector using an EAA approach to prioritise key areas where tools are required or priority issues which need to be addressed through the use of specific planning and management tools.
- Undertake a review of how the competent national agencies could coordinate more effectively in the key areas of food safety, environmental

management and biosecurity. Strengthening integration and coordination such that this supports sectoral management and minimising negative impacts should be investigated. Agencies should review the legislation and regulatory implications of this and consider upgrading relevant national legislation/policy accordingly.

- The competent agency for fisheries/aquaculture should undertake awareness raising and develop a communication strategy to sensitise policy-makers, regulatory agencies, farmers over the application of the tools and their benefits to the sector.
- Develop the opportunities presented by effective public private partnerships in providing services to the planning and management of the sector (e.g. private testing systems, quarantine, EIA, certification quality testing etc.).
- Look into how national competent agencies could benefit from the effective use of services and the oversight mechanisms that ensure they effectively support the aquaculture sector.
- Provide relevant training in the use of specific tools at national level.

The workshop findings and recommendations, country papers and the regional synthesis will be published as a FAO/NACA technical publication in due course.

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## Workshop on Proficiency Testing Programme for Aquatic Animal Disease Diagnostic Laboratories in Asia-Pacific

The two-day regional workshop was held at Centara Grand Hotel in Bangkok, Thailand. It was organized by NACA with funding from the Australian Government Department of Agriculture, Fisheries and Forestry (DAFF) and in collaboration with Australian National Quality Assurance Programme (ANQAP) and the Animal Health Laboratory of Commonwealth Scientific and Industrial Research Organisation (CSIRO). The workshop was undertaken as a preliminary activity of the whole Regional Proficiency Testing (RPT) Programme, with the following specific objectives:

- To strengthen Asia's regional capability to diagnose important aquatic animal diseases that impact on trade, industry sustainability and/or productivity.
- To train participating laboratory personnel in diagnostic standards, and proficiency testing procedures, and to provide technical assistance to improve laboratory performance.
- To establish a laboratory proficiency testing programme that meets regional needs and which can be accessed following completion of the project.

Forty-five participants attended the workshop, representing forty-three aquatic animal disease diagnostic laboratories from thirteen Asia-Pacific countries (Bangladesh, Cambodia, China, Hong Kong, India, Indonesia, Iran, Malaysia, Myanmar, Philippines,

Sri Lanka, Thailand and Vietnam). Dr. EM Leano (Coordinator, Aquatic Animal Health Programme, NACA) welcomed all the experts and participants on behalf of NACA Director General, Dr. AE Eknath, while Dr. I Ernst (DAFF) gave an overview of the project and purpose of the current workshop. The importance of aquatic animal disease diagnostics in facilitating trade and detection of transboundary diseases was presented by Dr. CV Mohan (Manager, Research and Development, NACA). Highlighted in the presentation were the serious diseases affecting cultured fish and shrimps in the region, and new/emerging transboundary diseases (i.e. IMNV and EMS/AHPNS) which are causing severe economic losses in countries where outbreaks have been reported.

Dr. HT Myint (OIE Tokyo) elaborated the different OIE standards focusing on diagnostics of important aquatic animal diseases that are present in the region. The detailed procedures on the conduct of the actual RPT were presented by Drs. N. Gudkovs (CSIRO) and S. Warner (ANQAP) where participants were briefed on how the samples will

be prepared, distributed and analysed, the results form filled-up, the results sent back to ANQAP, and the summary report sent to all the participating laboratories. Confidentiality of the results submitted and reported was emphasized.

Representatives from each participating country had presented the current capacities of the different laboratories in terms of PCR diagnostics, as well as the list of priority diseases that will be included in the RPT programme. After a series of discussion facilitated by Dr. M Crane (CSIRO) and nominations from the participants, the following aquatic animal diseases were decided for inclusion in the panel of pathogens that will be used for the four rounds of Regional LPT in the next two years (2013-2014):

It was noted that not all the diseases included in the list will be sent to all of the participating laboratories during the rounds of testing. Samples to be sent will depend on the list requested by each laboratory based on their current capacity to perform PCR diagnostics for detection of the pathogen(s) involved.

Rank	Disease agent	OIE listed
1	White spot virus	Yes
2	Yellowhead virus	Yes
3	Taura syndrome virus	Yes
4	Infectious myonecrosis virus	Yes
5	Infectious hypodermal and haematopoietic necrosis virus	Yes
6	Megalocytiviruses (RSIV, ISKNV, GIV etc.)	Yes
7	Nervous necrosis viruses	No
8	Koi herpesvirus (CyHV-3)	Yes
9	<i>Macrobrachium rosenbergii</i> nodavirus (MrNV and XSV)	Yes
10	Spring viraemia of carp virus (SVCV)	Yes



Participants in the Workshop on Proficiency Testing Programme for Aquatic Animal Disease Diagnostic Laboratories.

## AFSPAN Project gets underway

The first meeting of the AFSPAN Project has concluded in Penang, Malaysia, hosted by the WorldFish Center from 10 to 13 September. The inception workshop was convened to allow technical and country partners to discuss the work programme, identify in-country data gathering requirements and to develop implementation strategies for the project.

### Understanding aquaculture's role in food security, poverty alleviation and nutrition

Information on the direct and indirect socio-economic impacts of aquaculture is limited in most developing countries. While aquaculture is often advocated as a tool for rural development, there are large gaps in the existing research base and many issues such as the contribution of aquaculture to human health, nutrition and micronutrients critical child development are often simply overlooked. As a result, aquaculture is often overlooked as a possible development assistance intervention, or conversely, may be introduced in inappropriate circumstances.

AFSPAN's goal is to develop methodologies that can be applied to understand the 'big picture' role of aquaculture in a development context. The project seeks to build an inter-disciplinary framework for a holistic assessment of aquaculture across a broad range of indicators,

incorporating food security, poverty alleviation and human nutrition issues and the linkages between them. It is anticipated that a better understanding of the role of aquaculture will permit more effective targeting of aquaculture-related development interventions.

### Developing the framework

The crux of the workshop was a joint review of the work programme by all partners, including discussion on prospective case studies and data collection arrangements. The project is being implemented through a set of nine work packages investigating different aspects including the role of aquaculture systems, social and cultural issues, nutrition, trade and markets and international cooperation. These will contribute to the development of an integrated analytical framework for quantifying the contribution of aquaculture in a broad development context. The work programme will operate across twelve developing and low-income food deficit countries, with the involvement of 20 partner organisations.

In the coming weeks and months, AFSPAN partners will share their work and experience through the project website. If you would like to keep up to date with developments, you may like to subscribe to the email newsletter to the AFSPAN RSS feed, both of which are available at [www.afspan.eu](http://www.afspan.eu).



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*Participants in the AFSPAN Inception Workshop.*