

## **Syndel Asia-Bayer Annual Shrimp Protection Roadshow 2012**

Syndel Asia Sdn Bhd and Bayer Co organizes a seminar every year to discuss and disseminate the latest industry information. This year, the seminar was held on the 23<sup>rd</sup>-26<sup>th</sup> of April in Butterworth, Lumut and Johor Bahru. This year, due to overwhelming problems with a new syndrome which started late 2010, the topic which was discussed was Early Mortality Syndrome or EMS. Before starting the seminar, participants were required to fill out a short questionnaire regarding their culture practices in the first 30 days of culture.

The seminar started with a short video which showed that EMS is a regional problem that has affected China, Vietnam, Malaysia and Thailand. Two speakers were invited to speak on the current issue, Dr Chalor Limsuwan (Faculty of Fisheries, Kasetsart University) and Dr Pornlerd Chanratchakool (Novozymes Biologicals).

Dr Chalor spoke on the latest research from the Aquaculture Business Research Center, Kasetsart University, Thailand. In his presentation, EMS, also known as Acute Hepatopancreatic Necrotic Syndrome (AHNS) was first noticed in China and has since been observed in Vietnam, Malaysia and lastly, in Thailand. EMS is characterized by high mortalities, usually 40-60%, and in severe cases up to 80-100%. Mortalities also occur before 35 days of culture (DOC). Other common symptoms are hepatopancreas (HP) has less lipid droplets, an initially swollen HP where histological slides of the HP show cells with enlarged nuclei.

According to Dr Chalor, when EMS was first discovered in Thailand in September 2011, farmers thought that it was a form of vibriosis and proceeded to observe stricter biosecurity and disinfectant practices. However the disease continued to spread and by 2012, the infection became more severe and up to 500 ponds were infected.

In collaboration with Dr Timothy Flegel from the Center of Excellence for Shrimp Molecular Biology and Biotechnology (Centex Shrimp), a predominance of pathogenic bacteria in the affected shrimp HP was found, namely:

- Burkholderiales : *Ralstonia*
- Sphingononadales : *Delftia /Pseudomonas*
- Actinomycetales : *Leifsonia, Rhodococcus*

These bacteria are not commonly found in the natural pond environment and should not be present in the shrimp HP. Yet, numerous specimens showed numbers that are too high to be a chance occurrence in the shrimp. A common trait amongst these bacteria is the ability to survive and grow well at low pH levels. Dr Chalor suspects that these bacteria were selected for these particular traits so that the hatchery tanks can be maintained at low pH levels to reduce vibrio infections. These hatcheries apply these bacteria as part of their probiotic program and unknowingly have infected all the PLs from these hatcheries with the pathogenic bacteria. Subsequently infected shrimp then start to succumb from necrosis of the HP when transported from the hatcheries to the grow out ponds due to stress. Dr Chalor thinks that if the hatcheries stop the use the pathogenic bacteria, there should be a lessening of EMS outbreaks by the end of June. However, since the environment has already been contaminated, there will still be outbreaks and a better bacterial disinfection program

for the pond water and environment prior to stocking is a must. Meanwhile any immunostimulants or supplements that can help to improve the health of the shrimp should also be considered. He also thinks that shrimp that die after 35 DOC are due to other diseases and not EMS.

Syndel Asia conducted a survey to identify key practices that could be contributing to EMS or helping to alleviate the problem. This survey was beneficial to the farmers as many of them are unaware of potential problems in their practices and were happy to learn of different tactics that may help them in their farming. Dr Pornlerd discussed the farmers answers as part of his presentation. About 25% of farmers in Malaysia agree with Dr Chalor and Dr Pornlerd that PLs could be a source of the problem, about 20% of farmers also think that water quality is a contributing factor to EMS. 47% were unsure of the cause. What could be the trigger for EMS? 93.33% of farmers had salinity ranging between 10-25ppt. About 55% of farmers did not observe plankton die off before shrimp started dying, but 37% did. Bad weather or rainy/cloudy days were not a factor contributing to EMS for about 53% of farmers. 81% of farmers had their accumulated feed between 150kg-250kg in the first 30 DOC, with about 29% of farmers recording 200kgs. Thus we can summarise that salinity, plankton over and under bloom, bad weather and overfeeding are not causes for EMS.

What are the symptoms of EMS outbreaks? An overwhelming 70% of farmers who answered the survey, noticed that shrimp are more likely to die during or after moulting (Graph 1). Other symptoms that have been noticed are soft shell (35%) and white body (45%) [Graph 2]. 54% of farmers think that fast growing shrimp are more susceptible to EMS. What methods of disinfection of pond water and environment are used during pond preparation and during culture? About 49.33% of farmers use virus carrier killers, 21.33% use synthetic pyrethroids, 8.00% use other chemicals, while 26.67% use chlorine as a general disinfectant before culture (Graph 3). During culture, the most popular disinfectant used were potassium monopersulphate (29%), chlorine (24%), various other chemicals (with percentages ranging from 5-12%) like iodine, hydrogen peroxide and benzylkilonium chloride (BKC), while 33% of respondents had no answer (Graph 4).

Several key points need to be done to help reduce incidence of EMS. Firstly, the pond environment needs to be well prepared, the sludge should be removed or the pond bottom be completely dried, the water either in the reservoir or in the pond needs to be thoroughly disinfected, not only with a virus carrier killer but also something to kill the pathogenic bacteria. Secondly, good PLs (preferable PL 10 and above) from reliable hatcheries should be sourced and the hepatopancreas should be checked to make sure that they are healthy. Stocking density of shrimp should be reduced or be based on the pond carrying capacity whereby in white shrimp a maximum between 13 tonnes to 15 tonnes of shrimp should be cultured per hectare. For Black tiger, the maximum carrying capacity of a pond is between 6 tonnes to 8 tonnes per hectare. These numbers assume that there is no partial harvesting. Feed amount should be well controlled at about 12kg/100,000pcs/day of shrimp at DOC30 with average body weight at 2.0-2.5g. The accumulated feed at 30 DOC should not be more than 250kg. Feed amount should be reduced when water temperatures fall below 26°C and maximum daily feed increment should only be 500g/100,000 pcs shrimp. The dissolved oxygen (DO) levels should be >3.0ppm near the edge of sludge. Approximately 1 horse power of aeration should be provided for every 400kg of shrimp. When adequate oxygen is provided, then problems with toxic hydrogen sulphide (H<sub>2</sub>S), ammonia and nitrite can be prevented. When the pond carrying capacity is nearly reached, then the shrimp should be partially harvested or a total harvest should be conducted to avoid potential problems. Signs that a pond is reaching its carrying capacity are when the shrimp

feed starts to level off or decrease, when there is slow growth of shrimp and when DO levels start to become low etc.

In conclusion, if what Dr Chalor suspects is true, and assuming that the particular hatcheries make changes in their application of the pathogenic bacteria, then there should be a lessening of EMS outbreaks starting by end of June, though outbreaks will still continue until most of the pathogenic bacteria have been purged from the environment. Meanwhile a better disinfection protocol coupled with immune boosters and supplements to improve the health of the shrimp may help reduce the incidence of outbreaks.

For any enquiries about this article, please contact [erin@syndelasia.com](mailto:erin@syndelasia.com) or visit our website [www.syndelasia.com](http://www.syndelasia.com) or LIKE us at our Facebook page- Syndel Asia.

**Photos:**

**Caption for Syndel Team Butterworth:** From left to right: Fakhri Hanif, Erin Tan, Karu @ Kevin, Liew Chiow Yen (Bayer), Dr Chalor Limsuwan (Kasetsart U), Dr Pornlerd Chanratchakool (Novozymes Biologicals), Sugania Vijayan, Khaw Seek Chuan

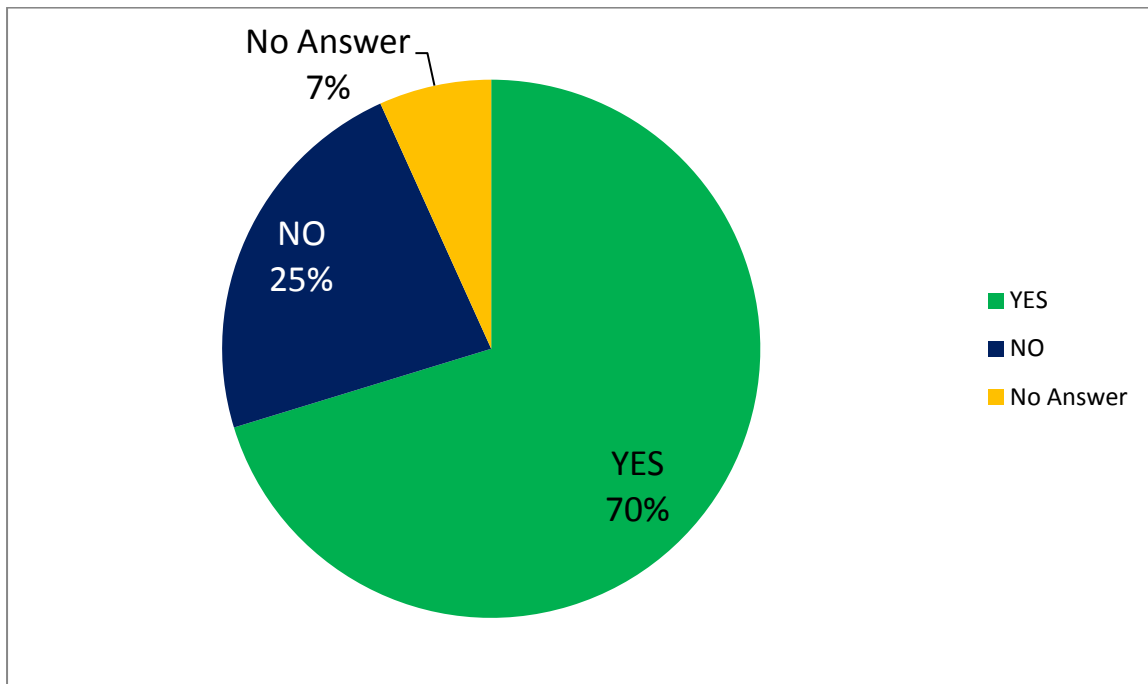
**Caption for Syndel Team JB:** Back row, left to right: Fakhri Hanif, Sim Jiun Horng, Dr Pornlerd Chanratchakool (Novozymes Biologicals), Dr Chalor Limsuwan (Kasetsart U), Khaw Seek Chuan, Karu @ Kevin.

Front row: Sugania Vijayan, Liew Chiow Yen (Bayer)

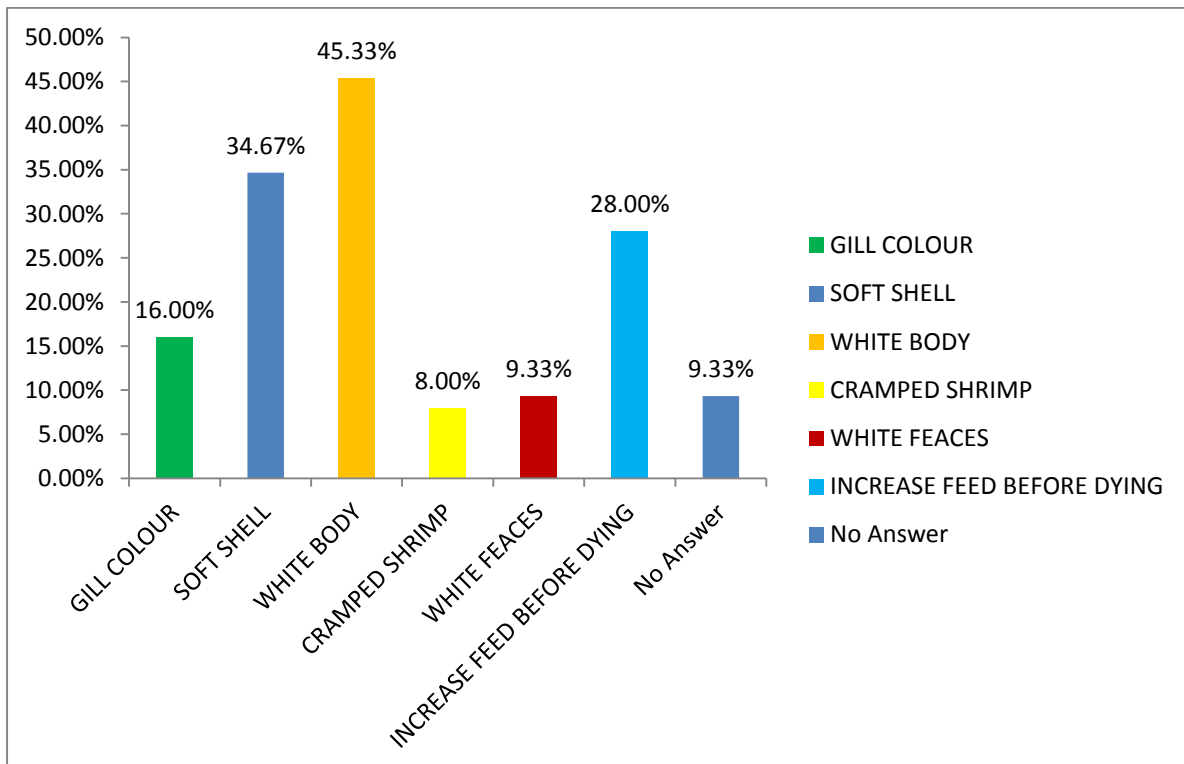
**Other captions please follow the title of photos.**

## Graphs

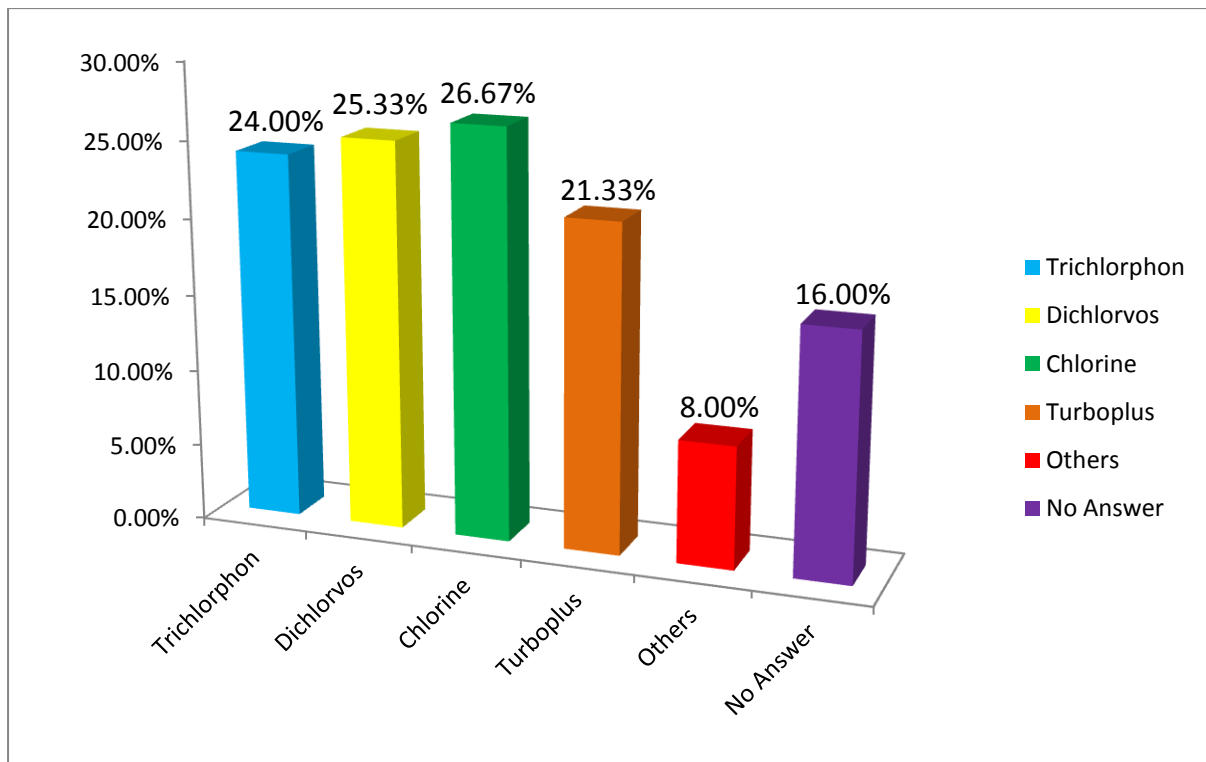
Graph 1: Do Shrimp Die During or After Moulting?



Graph 2: What are the Symptoms of EMS? (multiple choice answer, percentages may add up to >100%)



Graph 3: What Disinfectants were Used During Pond Preparation? (multiple choice answer, percentages may add up to >100%)



Graph 4: What Disinfectants were used During Culture? (multiple choice answer, percentages may add up to >100%)

