Noriaki Akazawa

Agrobest Sdn. Bhd.
Malaysia

Noriaki Akazawa is managing director of a major shrimp farm and processing operation owned by Agrobest Sdn. Bhd. in Malaysia. Over 15 years, he increased production despite the presence of diseases – most recently early mortality syndrome. Akazawa’s research, including his recent finding on the pH “trigger” for EMS, has established him as a global expert on farm management for the disease. He is completing his doctorate degree at Kinki University in Japan based on this research.
EMS – Agrobest’s Experience in Malaysia Farm

Noriaki Akazawa
Status of EMS in Malaysia/Agrobest

Vannamei
1st outbreak happened in late 2010 or early 2011 in Peninsula Malaysia. Vannamei production gradually came back after 2 years.

2nd outbreak happened in the middle of 2013.

Comparison between 1st and 2nd outbreak

<table>
<thead>
<tr>
<th></th>
<th>1st outbreak</th>
<th>2nd outbreak</th>
</tr>
</thead>
<tbody>
<tr>
<td>Symptom</td>
<td>Water color change to black green (around 30 days)</td>
<td>Water color still transparent (even 1 week after start of mortality)</td>
</tr>
<tr>
<td>Shrimp</td>
<td>White muscle, molting, mortality</td>
<td>White muscle, molting, mortality</td>
</tr>
<tr>
<td></td>
<td>Fast mortality</td>
<td>Slow mortality</td>
</tr>
<tr>
<td>Pathogen</td>
<td>From hatchery</td>
<td>From hatchery</td>
</tr>
<tr>
<td>Spreading</td>
<td>Infected early stage of culture</td>
<td>Infected early stage of culture</td>
</tr>
<tr>
<td></td>
<td>Infection to neighboring ponds</td>
<td>Infection to neighboring ponds</td>
</tr>
<tr>
<td></td>
<td>Mid size also infected seriously</td>
<td>Mid size not obviously infected</td>
</tr>
<tr>
<td></td>
<td>Large shrimp also infected more seriously</td>
<td>Large shrimp not infected</td>
</tr>
</tbody>
</table>

Local market price kept rising. After 1 year in Agrobest effort to recover 14t/ha of productivity (stocking density 85 P/m², 80-95% survival).

2nd outbreak is more serious than 1st outbreak.
Recent research
*All ponds contain *Vibrio parahaemolyticus*

**Pond sampling for Vibrio parahaemolyticus vs Total Vibrio**

![Graph showing comparison of Vibrio parahaemolyticus and Total Vibrio levels.]

**Legend:**
- Infected
- Continue

**Notes:**
1. All ponds contain *Vibrio parahaemolyticus*.
# Trials with Black Tiger Shrimp (P. monodon)

At Agrobest, *P. monodon* are never infected with EMS, even though when raised in ponds beside *P. vannamei*.

### PCR Check for Monodon ‘SPF’ PL, 2013

<table>
<thead>
<tr>
<th>Virus</th>
<th>Total</th>
<th>Batch</th>
<th>Sample</th>
<th>Ratio</th>
</tr>
</thead>
<tbody>
<tr>
<td>WSSV</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0.0%</td>
</tr>
<tr>
<td>IHNV</td>
<td>6</td>
<td>14</td>
<td>25.5%</td>
<td></td>
</tr>
<tr>
<td>HPV</td>
<td>4</td>
<td>12</td>
<td>21.8%</td>
<td></td>
</tr>
<tr>
<td>NHPV</td>
<td>0</td>
<td>0</td>
<td>0.0%</td>
<td></td>
</tr>
<tr>
<td>TSV</td>
<td>0</td>
<td>0</td>
<td>0.0%</td>
<td></td>
</tr>
<tr>
<td>IMNV</td>
<td>0</td>
<td>0</td>
<td>0.0%</td>
<td></td>
</tr>
<tr>
<td>YHV</td>
<td>0</td>
<td>0</td>
<td>0.0%</td>
<td></td>
</tr>
<tr>
<td>GAV</td>
<td>0</td>
<td>0</td>
<td>0.0%</td>
<td></td>
</tr>
<tr>
<td>MBV</td>
<td>0</td>
<td>0</td>
<td>0.0%</td>
<td></td>
</tr>
</tbody>
</table>

**Complication**

- Over 50% of batch detected virus
- 47% of sample detected virus
- Not deducted double

**Virus may influence some cases**

**Worldwide environment becomes serious for farming**

### Shrimp Farming Disease Outbreak

<table>
<thead>
<tr>
<th>Pathogen</th>
<th>Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bacterial infection</td>
<td>Vibrio</td>
</tr>
<tr>
<td>Virus infection</td>
<td>WSSV, TSV, IMNV</td>
</tr>
<tr>
<td>Multi-Virus infection</td>
<td>Slow growth +</td>
</tr>
<tr>
<td>Bacteria + Virus</td>
<td>Early mortality +</td>
</tr>
</tbody>
</table>
Prospects for Future

Conclusion
Against Pathogen
1. Continue to Study for Pathogen
2. Simple Detection Method
3. Understand the Infection Level

Set up Farming Method under EMS
1. Develop Water Sterilizer or Disinfectant
2. Good Probiotic Research
3. Develop Functional Feed
4. Good Facility Design

Avoid EMS/AHPNS

Shrimp
- SPR or New Species
- Checking Pathogen Level & Treatment

Environment
- Checking Pathogen Level & Treatment
- Checking Virus infection
- Checking Pathogen Level
- Checking Pathogen Level & Treatment

Water source
- Vibrio sp
- Other Bacteria
- Microspordia
- other parameter

Pond culturing
- Checking Point
  - Nutritional condition
  - Control Algae
  - pH range
  - Microspordia

- Checking Pathogen Level & Treatment
  - Sterilizer
  - Disinfection
  - Probiotic bacteria

- Checking Pathogen Level & Treatment
  - Good Bio Flock
  - Disinfection ?

Water Management
- Data analysis
- Chemical data
- Biological data

Health Monitoring
- Growth
- Mortality
- Vibrio sp
- Shrimp health

Feed Management
- Functional Feed
- Disinfection
- Probiotic
- Immunity up grade
- Feeding control

Harvest