Status, challenges and trends of the shrimp farming industry in Vietnam

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Agenda

• Status of the shrimp industry in Vietnam

• The challenges of the shrimp industry in Vietnam

• Key points for the success of Vietnam shrimp farms

• Trends of the shrimp industry in Vietnam
The status – production

Production volume (1,000 MT)

Shrimp production by species (1,000 MT)

Department of Processing and Development of Agricultural Market (March, 2017)

Penaeus monodon  Penaeus vannamei
### The status – export

#### Export value (Million US$)

<table>
<thead>
<tr>
<th>Year</th>
<th>2013</th>
<th>2014</th>
<th>2015</th>
<th>2016</th>
</tr>
</thead>
<tbody>
<tr>
<td>2013</td>
<td>3.144</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2014</td>
<td></td>
<td>3.952</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2015</td>
<td>2.952</td>
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<td></td>
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<tr>
<td>2016</td>
<td>3.146</td>
<td></td>
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</tr>
</tbody>
</table>

#### Import countries for Vietnam shrimp

<table>
<thead>
<tr>
<th>Country</th>
<th>2015 (%)</th>
<th>2016 (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>USA</td>
<td>22,2</td>
<td>22,5</td>
</tr>
<tr>
<td>EU</td>
<td>18,6</td>
<td>19,1</td>
</tr>
<tr>
<td>Japan</td>
<td>19,8</td>
<td>19,0</td>
</tr>
<tr>
<td>China &amp; Hongkong</td>
<td>11,9</td>
<td>13,8</td>
</tr>
<tr>
<td>Korea</td>
<td>8,5</td>
<td>9,0</td>
</tr>
<tr>
<td>Canada</td>
<td>4,7</td>
<td>3,9</td>
</tr>
<tr>
<td>Australia</td>
<td>3,8</td>
<td>3,6</td>
</tr>
<tr>
<td>ASEAN</td>
<td>1,9</td>
<td>1,8</td>
</tr>
<tr>
<td>Taiwan</td>
<td>2,2</td>
<td>1,6</td>
</tr>
<tr>
<td>Swiss</td>
<td>1,0</td>
<td>1,1</td>
</tr>
<tr>
<td>Others</td>
<td>5,4</td>
<td>4,6</td>
</tr>
</tbody>
</table>

Department of Processing and Development of Agricultural Market (March, 2017)
The status – *Penaeus vannamei* technologies

**Directly stock in earthen ponds**

- Area (m²/pond): 2,000-5,000
- Stocking density (PL/m²): 100
- Culture period (day): 90-105
- Size at harvest (pcs/kg): 32-50
- Yield (tons/ha): 15 - 25
- FCR: 1.1 - 1.3
- Production cost ($/kg): 3.0-3.3
- 50% is feed cost (42-40% protein)
  - 25%: probitocis/minerals, etc.
  - 25%: PL, electricity, technicians
- Profit ($/kg): 3 - 4.4

**Characters and farming techniques**

- Reservoir with Tilapia or/and under-ground water
- Salinity: 3 – 15 ppt
- Green algae in the first phase
  - Fermented rice bran
  - Mollases, Bacillus sp.
- Flocs in the later phase.
  - Bacillus sp.
  - Mollases
- High DO (45 HP – 90 HP/ha)
- High alkalinity (150 - 400 mg/L)
- Stable pH: 7.7 – 7.9
The status – *Penaeus vannamei* technologies

Nursery 20-30 days for grow-out lined ponds

- Area (m²): 100 – 500
- Depth (m): 0.7 – 0.8
- Stocking density (Pl/m²): 2,000-6,000
- Culture period (day): 20-30
- Size at harvest (pcs/kg): 1,000-1,400
- Survival (%): 90
- Daily siphon
- Adding new water
- Mollasses/probiotics
- Maintain pH of 7.6 – 7.9
- Flocs at the beginning
- Ca⁺⁺ > 300, Mg⁺⁺ > 1,000
- High alkalinity: 180 – 400 mg/L
- Adding hatchery feeds on some the first days
The status – technologies

1g-shrimp stock in lined ponds

Characters and farming techniques

- Stocking density (PL/m²): 250
- Culture period (days): 70-90 (Including nursery period)
- Size at harvest (pcs/kg): 50-30
- Partial harvests
- Yeild: 40 - 70 tons/ha
- FCR: 1.1 - 1.3
- Production cost: 3.6 $/kg
  - 50% is feeded (42%-40% protein)
  - 25%: probiotics/minerals, etc.
  - 25%: PL, electricity, technicians
- Profit: 3.5 $/kg

- Reservoir with Tilapia plus underground water
- Salinity: 10-20 ppt
- High DO (100 HP – 150 HP/ha, with aero-tube in the bottom)
- High alkalinity (150 - 400 mg/L)
- Stable pH: 7.7 – 7.9
- Ca++ > 300 ppm, Mg++ > 1000 ppm
- Adding high mollasses and probiotics
- Daily Siphone and adding new water 20% to 50%.
### The status – economic aspects

<table>
<thead>
<tr>
<th>Item</th>
<th>Lined pond</th>
<th>Earthen pond</th>
<th>Earthen pond</th>
</tr>
</thead>
<tbody>
<tr>
<td>Area, m²</td>
<td>1,300</td>
<td>2,500</td>
<td>4,500</td>
</tr>
<tr>
<td>Stocking density (PL/m²)</td>
<td>230</td>
<td>100</td>
<td>100</td>
</tr>
<tr>
<td>Nursery (DOC)</td>
<td>20</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Grow-out (DOC)</td>
<td>52</td>
<td>58</td>
<td>64</td>
</tr>
<tr>
<td>Size at harvest (pcs/kg)</td>
<td>41</td>
<td>37</td>
<td>32</td>
</tr>
<tr>
<td>Production at harvest (kg)</td>
<td>2,013</td>
<td>1,141</td>
<td>3,846</td>
</tr>
<tr>
<td>Selling price (VND/kg)</td>
<td>144,000</td>
<td>155,000</td>
<td>171,000</td>
</tr>
<tr>
<td>Survival (%)</td>
<td>83</td>
<td>90</td>
<td>85</td>
</tr>
<tr>
<td>FCR</td>
<td>1.14</td>
<td>1.1</td>
<td>1.3</td>
</tr>
<tr>
<td>Yield (MT/ha)</td>
<td>53.85</td>
<td>18</td>
<td>26.7</td>
</tr>
<tr>
<td>Production cost (VND/kg)</td>
<td>82,000</td>
<td>68,000</td>
<td>75,000</td>
</tr>
<tr>
<td>Profit (VND/kg)</td>
<td>78,000</td>
<td>67,000</td>
<td>100,000</td>
</tr>
</tbody>
</table>

Exchange rate: 22,700 VND/US$
The challenges – PL quality

- Huge number of hatcheries: > 2,000
- Shortage of good Quality broodstocks
- Not well controlled and quarantine program
- High variation of quality
- Disease contamination: EHP or/and EMS
The challenges – PL quality

- Huge number of hatcheries: > 2,000
- Shortage of good Quality broodstocks
- Not controlled and quarantine program
- High variation of quality
- Disease contamination: EHP
  - + 30 days: 500-600 pcs/kg
  - + 45 days: 350-400 pcs/kg
  - + 60 days: 250 – 300 pcs/kg
The challenges – Disease

EMS

EHP

White feces

Licin garlic

(Electroencephalogram)
The challenges – weather (climate change)

- Very hot weather (Feb-March)
  - EMS
  - White feces
  - Exhausted dissolved oxygen

- Big raining or flooding season (Sept-Nov)
  - EMS
  - White feces
  - White muscle
  - Un-complete molting
  - Algae collapse
The challenges – feed quality

Shrimp feed quality is significantly impacted by fishmeal in Asia

Fishmeal in Asian shrimp feeds: 20% – 40% inclusion in diets

Source: personal observation
The challenges – feed quality

Fishmeal demand and price pressure

World capture fisheries and aquaculture production

Million tonnes

Aquaculture production
Capture production

Trends in the price of fishmeal and soybean meal

US$/tonne


FAO, 2014, The state of world fisheries and aquaculture

FAO, 2014
The challenges – feed quality

Factors limiting dietary fishmeal replacement

(1) Protein amino acids: protein digestibility, bioavailability of amino acids, deficiency in amino acids (methionine) or functional amino acids (methionine, taurine, leucine), etc.

(2) DHA/EPA and Cholesterols

(3) Anti-nutrition factors and less attractants from plant protein sources.

(4) Others: availability and consistency.
The challenges – feed quality

Alternatives for fishmeal replacement are very few...

• Soy Protein Concentrates

• Insect meal: available and consistent issues

• Corn Protein Concentrates – Empyreal 75
  Qualified for fishmeal replacement
  Availability
  Consistent quality
  Improve physical pellet quality
  Food safety
  Address production cost
Key points for the success of Vietnam shrimp farms

• Select high quality postlarvae

• High quality starter feeds

• Premium feeds for grow-out

• Water reservoir with Tilapia

• Mostly focus on farm management
  - Less feeds in first month (180-270kg)
  - High dissolved oxygen (> 5 mg/L)
  - High alkalinity (150 – 400 mg/L)
  - Low stable pH (7.6 – 7.9)
  - Apply probiotics & molasses
  - Orchis mesh during the hot season
The trends

• Move to nursery for the high-density lined ponds
• Move to bigger-size harvest for good price
• Small farmers switch to P. Mondon while big players go for P. vannamei
• More application of the probiotics
• Looking for fishmeal replacement in shrimp diets
• Increasing aware of food safety to be accepted in the world market
• Big players more open to implement new technologies (Bioflocs, RAS, etc.)
Thank you!