Shrimp Production Review

- **Professor James L. Anderson**, Director, Institute for Sustainable Food Systems - University of Florida
- **Dr. Diego Valderrama**, University of los Andes, Colombia
- **Dr. Darryl Jory**, Editor Emeritus, Global Aquaculture Alliance
Other
Middle East / N Africa
India
Americas
China
Southeast Asia


Southeast Asia includes Thailand, Vietnam, Indonesia, Bangladesh, Malaysia, Philippines, Myanmar and Taiwan.

*M. rosenbergii* is not included.
Shrimp Aquaculture Production by World Region: 2000-2019
(FAO and GOAL Data)


Southeast Asia includes Thailand, Vietnam, Indonesia, Bangladesh, Malaysia, Philippines, Myanmar and Taiwan.

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Shrimp Aquaculture Production by World Region: 2000-2019 (FAO and GOAL Data)


Southeast Asia includes Thailand, Vietnam, Indonesia, Bangladesh, Malaysia, Philippines, Myanmar and Taiwan.

*M. rosenbergii* is not included.
FAO Data do not reflect any major impact of diseases in 2013.


*M. rosenbergii* is not included.
Production of L. vannamei in China
Estimates Provided by GOAL Survey Respondents, 2010-2016

Sources: FAO (2017); GOAL (2011-2017).
*Unweighted average of GOAL estimates
Southeast Asia includes Thailand, Vietnam, Indonesia, Bangladesh, Malaysia, Philippines, Myanmar and Taiwan.

*M. rosenbergii* is not included.

Southeast Asia includes Thailand, Vietnam, Indonesia, Bangladesh, Malaysia, Philippines, Myanmar and Taiwan.

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Compound Annual Growth Rate

<table>
<thead>
<tr>
<th>Region</th>
<th>2012-2015</th>
<th>2015-2019</th>
</tr>
</thead>
<tbody>
<tr>
<td>Southeast Asia</td>
<td>-2.3%</td>
<td>7.7%</td>
</tr>
<tr>
<td>China</td>
<td>-2.7%</td>
<td>-1.5%</td>
</tr>
<tr>
<td>India</td>
<td>18.8%</td>
<td>11.2%</td>
</tr>
<tr>
<td>Americas</td>
<td>7.9%</td>
<td>6.4%</td>
</tr>
</tbody>
</table>
Impact of diseases:
Production decreased substantially in China and Thailand in 2013, with only a partial recovery expected by 2019.

Production has been fluctuating in Vietnam and Indonesia, with positive growth expectations by 2019.

Production in India is clearly trending upwards.


*M. rosenbergii* is not included.
Bangladesh and Myanmar respondents expect lower production in 2019 relative to 2012.

Malaysia was strongly affected by EMS but the industry is expected to recover by 2019.


*M. rosenbergii* is not included.
Ecuador has experienced strong growth in the last few years.

Mexico has recovered after being impacted by EMS in 2013.

Although production in Brazil has hovered around 75,000 tons, it is expected to reach 100,000 tons in 2019.


*M. rosenbergii* is not included.
Production in Honduras and Nicaragua has fluctuated in the most recent years. Guatemala, Peru and Venezuela (despite its economic crisis) are poised for further growth.


*M. rosenbergii* is not included.
Among the minor farming nations in Latin America, highest expectations for growth were reported for Panama.


*M. rosenbergii* is not included.
World Shrimp Aquaculture (including M. rosenbergii) by Species: 1995-2019

Percentages indicate the share of *L. vannamei*.

Shrimp Aquaculture (including M. rosenbergii) in Asia by Species: 1995-2019

Percentages indicate the share of *L. vannamei*.

World Landings of Wild-Caught Shrimp by Species

- Others
- Akiami paste shrimp (Acetes japonicus)
- Argentine red shrimp (Pleoticus muelleri)
- Banana prawn (Penaeus merguiensis)
- Fleshy prawn (Penaeus chinensis)
- Giant tiger prawn (Penaeus monodon)
- Northern brown shrimp (Penaeus aztecus)
- Northern prawn (Pandalus borealis)
- Northern white shrimp (Penaeus setiferus)
- Southern rough shrimp (Trachipenaeus curvirostris)
- Ocean shrimp (Pandalus jordani)

Aquaculture accounted for 54% of world shrimp supplies in 2015.

Sources: FAO (2017) and GOAL (2011, 2016).

*M. rosenbergii* is not included.

China includes freshwater production of *L. vannamei*.
L. vannamei is the most important species in the world, with virtually all production coming from aquaculture.

Percentages indicate the share of L. vannamei.

Sources: FAO (2017) and GOAL (2011, 2016).

*M. rosenbergii* is not included.

China includes freshwater production of *L. vannamei*.
Trends in Trade
Imports from Thailand declined sharply (by 68%) between 2010 and 2014, slightly recovering since then (from 65 to 75 thousand tons).

India and Indonesia have become the top exporters to the U.S. market, accounting for 50% of imports in 2017.

India’s exports have increased at a CAGR of 35% between 2008 and 2017.

Source: USDC/NMFS (2017)

*Estimate
U.S. Landings of Wild-Caught Shrimp

Source: USDC/NMFS (2017)
Real prices increased sharply in 2013 but returned to levels close to the long-term average in 2014 and 2015, remaining stable over the last 2 years.

Source: USDC/NMFS (2017)
Nominal prices increased sharply in 2013 and then returned to levels somewhat higher than the average prices observed in 2003-2009.

Source: USDC/NMFS (2017)
Although the European market has been contracting over the last 10 years, Ecuador continues to increase its market share, from 3% in 2000 to 18% in 2017. India has also increased shipments.

Source: Eurostat (2017)

*Estimate
Spanish Shrimp Imports: Down 16% between 2011-13, up 7% between 2013-17

Source: Eurostat (2017)
*Estimate
French Shrimp Imports: Down 9% between 2010-14, up 4% between 2014-17

Source: Eurostat (2017)

*Estimate
The disease crisis in Thailand led to an overall decline in Japanese shrimp imports, with a partial recovery expected in 2017 driven primarily by increased exports from Vietnam.

Source: Japan Customs (2017)

*Estimate
China - Exports and Imports of Frozen Shrimp

Source: WB/World Integrated Trade Solution Database (2017)

37% Decrease from 2011 to 2016

109% Increase from 2011 to 2016
Composition of Shrimp Aquaculture Production by Size Categories - Aggregate 2016

Composition of Shrimp Aquaculture by Size Categories

World 2010 vs. World 2016

## Expected Trends in Shrimp Aquaculture:

### Size Categories - Goal Survey 2017

<table>
<thead>
<tr>
<th>Size Category</th>
<th>Asia</th>
<th>Americas</th>
<th>World</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt;15</td>
<td>Stable</td>
<td>Decrease</td>
<td>Stable</td>
</tr>
<tr>
<td>15-20</td>
<td>Stable</td>
<td>Stable</td>
<td>Stable</td>
</tr>
<tr>
<td>21-25</td>
<td>Stable</td>
<td>Stable</td>
<td>Stable</td>
</tr>
<tr>
<td>26-30</td>
<td>Stable</td>
<td>Increase</td>
<td>Stable / Increase</td>
</tr>
<tr>
<td>31-40</td>
<td>Stable / Decrease</td>
<td>Stable</td>
<td>Stable / Decrease</td>
</tr>
<tr>
<td>41-50</td>
<td>Stable / Decrease</td>
<td>Stable</td>
<td>Stable / Decrease</td>
</tr>
<tr>
<td>51-60</td>
<td>Stable</td>
<td>Increase</td>
<td>Stable</td>
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<tr>
<td>61-70</td>
<td>Stable</td>
<td>Increase</td>
<td>Stable</td>
</tr>
<tr>
<td>&gt;70</td>
<td>Increase</td>
<td>Decrease</td>
<td>Increase</td>
</tr>
</tbody>
</table>
Composition of Shrimp Aquaculture by Product Form - Aggregate 2017

For a number of years, production of green/head-on shrimp for the European and Asian markets has been trending upwards in Ecuador.

### Expected Trends in Shrimp Aquaculture:
#### Product Forms - GOAL Survey 2017

<table>
<thead>
<tr>
<th>Product Form</th>
<th>Asia</th>
<th>Americas</th>
<th>World</th>
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</thead>
<tbody>
<tr>
<td>Green / Head-on</td>
<td>Decrease</td>
<td>Increase</td>
<td>Stable</td>
</tr>
<tr>
<td>Green / Head-off</td>
<td>Stable</td>
<td>Decrease</td>
<td>Stable</td>
</tr>
<tr>
<td>Peeled</td>
<td>Stable / Increase</td>
<td>Stable / Decrease</td>
<td>Stable / Increase</td>
</tr>
<tr>
<td>Cooked</td>
<td>Stable / Decrease</td>
<td>Stable</td>
<td>Stable / Decrease</td>
</tr>
<tr>
<td>Breaded</td>
<td>Increase</td>
<td>Stable</td>
<td>Increase</td>
</tr>
<tr>
<td>Other Forms</td>
<td>Increase</td>
<td>Stable / Decrease</td>
<td>Increase</td>
</tr>
</tbody>
</table>
GOAL 2017 Survey: Issues & Challenges in Shrimp Aquaculture - All Countries

- Diseases
- Seed stock quality & availability
- Access to disease-free broodstock
- ***Production costs - Feed/Fishmeal
- Environmental management
- ***International market prices
- Banned chemicals / antibiotic use
- Production costs - Others
- Product quality control
- Feed quality and availability
- Access to Credit
- ***International trade barriers
- Production costs - Fuel
- Market coordination
- Conflicts with other users
- Infrastructure
- Public Relations Management

Asterisks indicate a Top 3 issue in GOAL 2007 Survey.
## Worldwide Top Issues & Challenges in Shrimp Aquaculture:
### 2017 Survey vs 2016 Survey

<table>
<thead>
<tr>
<th>Issue</th>
<th>2016</th>
<th>2017</th>
</tr>
</thead>
<tbody>
<tr>
<td>Access to Credit</td>
<td>Not Important</td>
<td>Moderately Important</td>
</tr>
<tr>
<td>Access to disease-free broodstock</td>
<td>Not Important</td>
<td>Moderately Important</td>
</tr>
<tr>
<td>Diseases</td>
<td>Not Important</td>
<td>Moderately Important</td>
</tr>
<tr>
<td>Environmental management</td>
<td>Not Important</td>
<td>Moderately Important</td>
</tr>
<tr>
<td>International market prices</td>
<td>Not Important</td>
<td>Moderately Important</td>
</tr>
<tr>
<td>International trade barriers</td>
<td>Not Important</td>
<td>Moderately Important</td>
</tr>
<tr>
<td>Production costs - Feed/Fishmeal</td>
<td>Not Important</td>
<td>Moderately Important</td>
</tr>
<tr>
<td>Production costs - Fuel</td>
<td>Not Important</td>
<td>Moderately Important</td>
</tr>
<tr>
<td>Production costs - Others</td>
<td>Not Important</td>
<td>Moderately Important</td>
</tr>
<tr>
<td>Seed stock quality &amp; availability</td>
<td>Not Important</td>
<td>Moderately Important</td>
</tr>
</tbody>
</table>
Asterisks indicate a Top 3 issue in GOAL 2007 Survey.

Asterisks indicate a Top 3 issue in GOAL 2007 Survey.


- **Production costs - Feed/Fishmeal**
- **Diseases**
- **International market prices**
- **Access to disease-free broodstock**
- **Access to Credit**
- **Seed stock quality & availability**
- **Production costs - Others**
- **Production costs - Fuel**
- **Feed quality and availability**
- **International trade barriers**
- **Environmental management**
- **Public Relations Management**
- **Market coordination**
- **Product quality control**
- **Infrastructure**
- **Conflicts with other users**
- **Banned chemicals / antibiotic use**

Levels:
- Not Important
- Moderately Important
- Extremely Important
### GOAL 2017 Survey: Top Issues & Challenges in Shrimp Aquaculture - Asia vs Latin America

<table>
<thead>
<tr>
<th>Issue</th>
<th>Asia</th>
<th>Latin America</th>
</tr>
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<tbody>
<tr>
<td>Diseases</td>
<td>🟢</td>
<td>🔴</td>
</tr>
<tr>
<td>International market prices</td>
<td>轰炸机</td>
<td>🔴</td>
</tr>
<tr>
<td>Production costs - Feed/Fishmeal</td>
<td>🟡</td>
<td>🔴</td>
</tr>
<tr>
<td>Seed stock quality &amp; availability</td>
<td>🟢</td>
<td>🔴</td>
</tr>
<tr>
<td>Product quality control</td>
<td>🟡</td>
<td>🔴</td>
</tr>
<tr>
<td>Access to disease-free broodstock</td>
<td>🟡</td>
<td>🔴</td>
</tr>
<tr>
<td>Production costs - Others</td>
<td>🟡</td>
<td>🔴</td>
</tr>
<tr>
<td>Environmental management</td>
<td>🟡</td>
<td>🔴</td>
</tr>
<tr>
<td>Feed quality and availability</td>
<td>🟡</td>
<td>🔴</td>
</tr>
<tr>
<td>Production costs - Fuel</td>
<td>🟡</td>
<td>🔴</td>
</tr>
<tr>
<td>Access to Credit</td>
<td>🟢</td>
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<tr>
<td>Banned chemicals / antibiotic use</td>
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<td>Conflicts with other users</td>
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<td>Public Relations Management</td>
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<td>🔴</td>
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</table>
GOAL 2017 Survey: Global economic conditions will be better in 2018 compared to 2017

<table>
<thead>
<tr>
<th>Outlook</th>
<th>Asia</th>
<th>Americas</th>
<th>Others</th>
</tr>
</thead>
<tbody>
<tr>
<td>Strongly Agree</td>
<td></td>
<td>Honduras</td>
<td></td>
</tr>
<tr>
<td>Agree</td>
<td>Bangladesh, India, Myanmar, Philippines, Taiwan, Thailand</td>
<td>Brazil, Mexico, Peru</td>
<td>Madagascar</td>
</tr>
<tr>
<td>Neutral / No Opinion</td>
<td>China, Indonesia, Japan, Malaysia, Vietnam</td>
<td>Ecuador, Nicaragua, Venezuela</td>
<td>New Caledonia, Saudi Arabia</td>
</tr>
<tr>
<td>Disagree</td>
<td></td>
<td>South Korea</td>
<td></td>
</tr>
<tr>
<td>Strongly Disagree</td>
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<td></td>
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</tr>
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</table>
GOAL 2017 Survey: Feed prices will be lower in 2018 compared to 2017

<table>
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<tr>
<th>Outlook</th>
<th>Asia</th>
<th>Americas</th>
<th>Others</th>
</tr>
</thead>
<tbody>
<tr>
<td>Strongly Agree</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Agree</td>
<td></td>
<td>Nicaragua</td>
<td></td>
</tr>
<tr>
<td>Neutral / No Opinion</td>
<td>India, Philippines, Taiwan, Vietnam</td>
<td>Honduras, Mexico, Peru, Venezuela</td>
<td>Madagascar</td>
</tr>
<tr>
<td>Disagree</td>
<td>China, Indonesia, Japan, Malaysia, Myanmar, South Korea, Thailand</td>
<td>Ecuador</td>
<td>New Caledonia, Saudi Arabia</td>
</tr>
<tr>
<td>Strongly Disagree</td>
<td>Bangladesh</td>
<td>Brazil</td>
<td></td>
</tr>
</tbody>
</table>
GOAL 2017 Survey: The global shrimp market will strengthen in 2018 compared to 2017

<table>
<thead>
<tr>
<th>Outlook</th>
<th>Asia</th>
<th>Americas</th>
<th>Others</th>
</tr>
</thead>
<tbody>
<tr>
<td>Strongly Agree</td>
<td>Indonesia, Taiwan</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Agree</td>
<td>Bangladesh, China, Japan, Myanmar,</td>
<td>Brazil, Ecuador, Honduras, Peru,</td>
<td>New Caledonia</td>
</tr>
<tr>
<td></td>
<td>Philippines, Vietnam</td>
<td>Venezuela</td>
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<tr>
<td>Neutral / No Opinion</td>
<td>India, Malaysia, South Korea, Thailand</td>
<td>Mexico, Nicaragua</td>
<td>Madagascar</td>
</tr>
<tr>
<td>Disagree</td>
<td></td>
<td></td>
<td>Saudi Arabia</td>
</tr>
<tr>
<td>Strongly Disagree</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Conclusions

Global Shrimp Production Expectations

2016-17: +2%
2017-18: +5%
2016-19: +4.8% per year

Top 3 Constraints to Growth (Global & Asia):

#1 Disease
#2 Seed Stock Quality
#3 Disease-free Broodstock

Top 3 Constraints to Growth (Latin America):

#1 Production Cost
#2 Disease
#3 Market Prices

2018 - Expectations

Generally expect higher feed prices
Stronger shrimp markets (little more positive than last year)
Better global economic conditions (little more positive than last year)
Thank You!

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APPENDIX

Southeast Asia includes Thailand, Vietnam, Indonesia, Bangladesh, Malaysia, Philippines, Myanmar and Taiwan.

*M. rosenbergii* is not included.
Shrimp Aquaculture in Asia: 2012-2015 vs 2015-2019


Southeast Asia includes Thailand, Vietnam, Indonesia, Bangladesh, Malaysia, Philippines, Myanmar and Taiwan.

M. rosenbergii is not included.
Disease problems in Asia led to the harvesting of smaller sizes since 2011.
There was also a temporary trend towards smaller sizes in Latin America in 2011 and 2012.
Composition of Shrimp Aquaculture Production by Product Form - Comparison of Survey Data for Asia
China seems to be increasing its production of value-added products relative to green/peeled shrimp in the most recent years.
The growing share of the green head-on form reflects an increased presence of Ecuadorian shrimp in European and Asian markets.

- **Guangdong**: 36.4% (2006) vs. 20.1% (2016)
- **Guangxi**: 9.7% (2006) vs. 9.2% (2016)
- **Shandong**: 9.0% (2006) vs. 9.0% (2016)
- **Fujian**: 15.6% (2006) vs. 15.6% (2016)
- **Hainan**: 15.6% (2006) vs. 15.6% (2016)
- **Other**: 15.6% (2006) vs. 15.6% (2016)

Percentages are share across 2016.
Coinciding with falling supplies from Thailand, wholesale shrimp prices began rising in 2010 with the sharpest increase taking place in 2013.

Prices declined during 2014 and 2015 as other countries (India, Indonesia, Ecuador, Vietnam) increased their exports to the U.S.

Prices of BT shrimp have nevertheless increased since early 2016, widening the premium over white shrimp.

Source: Urner Barry (2017)