Rabobank: Globally leading food and agribusiness lender and financial services provider

46 Countries
Over 600 Offices
Over 55,000 Employees
Rabobank food and agribusiness sector research, 85 analysts globally. Specific focus on aquaculture, fisheries and seafood

**Food & Agri Research: global sector knowledge**

- Global research platform and local knowledge provide an in-depth network and understanding of the Food & Agri sectors
  - Over 80 dedicated global strategists and analysts covering 10 sub-sectors
  - Working closely with Rabobank’s CFA, AF, DCM and ECM bankers
- Fundamental research covering the entire Food & Agri chain and a wide array of topics ranging from macro themes, impacting a particular F&A industry, to micro-level analysis of individual companies
- All relevant topics in each sector are monitored from a local, regional and global perspective

In-depth sector focus appreciated by global Food & Agri investors
The shrimp aquaculture sector witnessed a huge expansion in the 2000’s, followed by a period with disease issues.

Global Shrimp aquaculture (marine species) 1980 – 2017E

- Aquaculture starts initially with wild juveniles
- Monodon farming drives growth
- Global prices high

- Period of virus diseases
- Monodon culture faces biological challenges
- Cost rise

- Vannamei introduction
- Industry 300% growth
- Consumption growth

- Era of non-viral diseases

Source: Rabobank, FAO 2017

*Chinese production includes freshwater Vannamei farming. M. Rosenbergii is not included. After 2011 we make significant corrections to FAO data based on industry sources.
Currently the shrimp sector is in a gradual recovery period but many biological challenges persist.

Production expectations by country, NFI panel 2017

Overall NFI panel global shrimp production expectations

Source: Rabobank, NFI 2017
In a nutshell: Due to EMS, supply from China and Thailand has been replaced with supply from Ecuador and India

Since approximately 2010

India +400k MT

China marine shrimp -500k to 400k MT

Ecuador +250k MT

Thailand -200k MT

Total +650k MT

Total: - 700k to -600MT

Source: Rabobank, 2017
China: Estimates are that domestic supply of marine shrimp is still contracting

**China: Farmed Shrimp production**

Thousands tonnes

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*Estimates based on industry expert opinion*

Source: FAO, NFI, Rabobank 2017
Based on official data China is still a net-exporter of shrimp, but is mostly likely already a net importer if the grey channel is included.

**China shrimp imports 2006-2016 (USD)**

Estimates are that approximately $1.5 billion of shrimp (wild and farmed), 2x the value of the legal shrimp imports enter China via the grey channel mostly via Vietnam.

**China shrimp exports 2009-2016 (HK excluded), USD**

Source: Rabobank, Food and Agriculture Organization 2017
Thailand shrimp exports show a $2bln decline as the industry suffered from EMS

**Shrimp exports of Thailand declining due to EMS**

**Importing countries of shrimp from Thailand by volume in 2015**

Source: Rabobank, UN CONTRADE 2017
Thailand: The once leading producer was hit by the perfect storm, EMS, EHP and “slavery on fish meal boats”

**Thailand: Farmed Shrimp production, tentative recovery**

<table>
<thead>
<tr>
<th>Year</th>
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<tbody>
<tr>
<td>2007</td>
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<td>391</td>
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<td>2016E</td>
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<td>2017E</td>
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Source: Rabobank, based on FAO and other sources 2017
Indian shrimp exports in 2008

2008

**EU (#1)**
- 65,603 tonnes
- $352 million

**Japan (#2)**
- 28,815 tonnes
- $192 million

**USA (#3)**
- 21,538 tonnes
- $141 million

**UAE (#4)**
- 6,837 tonnes
- $42 million

The map shows 85% of trade volume and 86% of trade value.
Booming Indian shrimp exports in 2015

2015

in order of trade volume

map shows
80% of volume
83% of value

USA (#1)
129,761 tonnes $1,235 million

EU (#2)
82,649 tonnes $621 million

Japan (#4)
32,827 tonnes $305 million

Vietnam (#3)
65,383 tonnes $496 million
India shrimp grew by over $2.5bln since 2010, making India the global No. 1 shrimp exporter

Shrimp exports of India

Importing countries of shrimp from India by volume in 2016

Source: UN CONTRADE 2017
India currently has the most rapidly growing shrimp industry in the world, with ample growth capacity.

India: Farmed Shrimp production continuing to grow, very strong first half of 2017

Success factors:

1. Low-intensity production model (for Asian standards)
2. Implemented vannamei 10 years later (fewer mistakes)
3. Most farms are new
4. High level of control by government (MPEDA)
5. Cluster farming system
6. Low cost land, labor and feed commodities
In the US market the decline of Thailand is substituted by India.

**US shrimp imports YTD (Jan-Apr)**

Source: Urner Berry 2017
Ecuador has also greatly expanded exports, with Vietnam (China) as the main destination.

**Shrimp exports of Ecuador**

**Importing countries of shrimp from Ecuador by volume in 2015**

- **Viet Nam**: 45%
- **EU**: 26%
- **USA**: 19%
- **China**: 3%
- **South Korea**: 2%
- **Colombia**: 2%
- **Russia**: 1%
- **Chile**: 1%
- **Japan**: 0.4%
- **Guatemala**: 0.4%
- **Others**: 1%

**Shrimp exports of Ecuador**

Source: UN CONTRADE 2017
In less than 6 years Ecuador's industry has shifted over 50% of its exported shrimp towards China

**Ecuadorian Shrimp exports YTD (Jan-May), in thousand pounds**

Source: Rabobank, Urner Barry, 2017
Ecuadorian shrimp exports use to be focused on EU and US

2008

in order of trade volume

- **EU (1)**: 72,836 tonnes, $390 million
- **USA (2)**: 51,565 tonnes, $293 million
- **Colombia (3)**: 1,914 tonnes, $5 million
- **Chile (4)**: 1,581 tonnes, $9 million
- **Japan (5)**: 853 tonnes, $6 million

map shows 98% of volume and 98% of value
Despite the distance and many local and regional exporters, Ecuador's exports are increasingly Asia focused.

2015

In order of trade volume:

- **Vietnam (#1)**: 119,339 tonnes $760 million
- **China (#4)**: 28,321 tonnes $187 million
- **USA (#3)**: 81,920 tonnes $591 million
- **Colombia (#6)**: 4,962 tonnes $29 million
- **EU (#2)**: 90,394 tonnes $586 million
- **South Korea (#5)**: 5,649 tonnes $42 million

Map shows 94% of volume and 93% of value.
Ecuador accounts for close to 50% of farmed shrimp production in Latin America, does it have a unique advantage?

Ecuador: Farmed Shrimp production WFE

Thousands tonnes

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1. Low-intensity production model
2. Few large groups control the sector
3. Distance from the Asian shrimp industry
4. Use of probiotics
5. Use of local genetics
6. High level of control by government
7. Favorable tariffs with import markets
8. Learnings from white spot outbreak in 1990's

Source: Rabobank, based on FAO and other sources 2017
Despite considerable shifts in supply, the market has remained balanced and shrimp prices continue relative stability.

*Shrimp prices, white and black shrimp index in the US (left axis), Thai shrimp price (right axis)*

Source: Urner Barry, Thai Union Frozen Foods, Rabobank 2017
And relative to other major proteins shrimp is currently one of the least expensive alternatives.

**Index of main protein sources 100=Jan 2007**

Source: Rabobank, Index mundi, 2017
Summary: farmed shrimp is a commodity with an elastic supply but shifting to lower density production models

1. Farming of vannamei shrimp grows rapidly
   - Supply growth of 300% between 2001 - 2010

2. EMS (and other diseases) emerge
   - EMS combined with rising demand turn China into a net importer
   - Thailand, Mexico and others also suffer from EMS

3. India replaces Thailand as leading exporter
   - India substitutes Thailand and China as exporters to the US and EU
   - Vietnam and Indonesia fall behind India

4. Ecuador shifts exports to China
   - Ecuador exports grow rapidly and shift to China
   - Argentina exports wild shrimp to China
   - Rest of LAM below potential
Final observations

- **Immature industry**: It is a growing sector globally with many new developing areas, but also with shifting competitiveness of regions and shifting trade flows (mostly due to disease).

- **Supply is elastic**: Disease will rarely have a long lasting impact on global price level (if the infection is not global).

- **Buyers market?** Prices have not increased much relative to other proteins.

- **Declining farming density**: Replacing Chinese and Thai supply with Indian and Ecuadorian supply is major decline in global fanning density.
Thank you for your attention

Rabobank. The financial link in the global food chain.™