The market for shrimps in Europe:

perspectives from the European indoor shrimp farming sector
+ engineering considerations

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About Landing Aquaculture

- Founded in 2014 by Rob van de Ven (Wageningen University)
- Aquaculture engineering and consultancy:
  - Market studies, feasibility studies and business planning
  - Training and education
  - Design and engineering
  - Procurement and supply
  - Construction and commissioning
- Main areas so far
  - Indoor shrimp farming (biofloc and RAS)
  - Aquaponic systems
  - Hatcheries (tilapia, shrimp, trout, eel)
  - Research, pilot and proof-of-concept systems
The shrimp farming sector

- Dominated by *L. vannamei*, seconded by *P. monodon*
- 10th species under production worldwide by volume (FAO, 2015)
- 1st species in value (FAO, 2015)
In Europe:

- Two-thirds of the total import value of all seafood products comes from tropical shrimp
- More than 50 countries have been involved at some point with exporting shrimp to the EU
- Increased public awareness of shrimp farming in the tropics
- Myriad of species, presentations, consumer perceptions and price ranges
- Where should shrimp farmers in the EU play?

![Share of shrimp products by type in the Barcelona Fish Auction, 2015.](chart)
Market study

- Desktop-based
- Sources from FishStat (FAO), EUMOFA, MERCASA Network
- Metrics to define the size of the market: trade balance, apparent consumption, self sufficiency ratio
  - Apparent consumption = imports + production - exports.
  - Trade balance: imports vs exports
  - Self-sufficiency ratio
Market study (2)

- Import origins help define possible competitors, presentations and prices
- Price trends on commodity shrimp across the value chain shows bottom price
- Prices of local, high value species can help us know how high can we aim
- What are other EU shrimp farmers doing?
Main markets – apparent consumption

Cumulative apparent consumption of frozen, tropical shrimp in the EU

Belgium
France
Germany
Italy
Netherlands
Portugal
Spain
United Kingdom
Main markets – apparent consumption

Comparative consumption trends on major EU markets compared to global aquaculture production

- Belgium
- France
- Germany
- Italy
- Netherlands
- Portugal
- Spain
- United Kingdom
- FAO Production
Main markets – import flows
Southern Europe example

Countries of origin for French Imports (aggregated 2010-2015 volumes)

Countries of origin for Spanish Imports (aggregated 2010-2015 volumes)
Northern Europe example

Countries of origin for German imports (aggregated 2010-2015 volumes)

Countries of origin for Dutch imports (aggregated 2010-2015 volumes)
So far:

- Southern Europe: high volumes, direct imports, mostly *L. vannamei* from South America – cheaper shrimp.
- Northern Europe: Lower volumes, both vannamei and monodon, more middlemen – more expensive shrimp

- Opportunity: value chains used to more expensive shrimp, more variety and lower volumes
- Threat: falling under competition with cheap tropical shrimp (does cooking/freezing make sense?)
Pricing

- Competitors: EU producers, other shrimp species, other seafood

Annualised import prices of frozen tropical shrimp – wholesale/import

Annualised import prices for frozen coldwater shrimp - wholesale/import
Some examples

- White shrimp (P. longirostis)
- Indian white Prawn (P. indicus)
- Red shrimp (A. antennatus)
- South American shrimp (P. vannamei)
- Shrimp from Tunisia and others
- Caramote prawn (P. kerathurus)

**Fresh shrimp**

**Cooked shrimp**
...And so far:

1. Freshness matters. Fresh shrimp = higher price

2. Location matters. Local production = higher price

3. There is ample confusion with proper naming of shrimp, (Argentinian red shrimp sold as local “scampi”, “king prawn” or “langoustine”). This can be an advantage.

4. Freezing and processing ultra-fresh shrimp = competition with other frozen and processed products
### Who is doing what in the EU?

<table>
<thead>
<tr>
<th>Producer country</th>
<th>Capacity</th>
<th>Sales price €/Kg</th>
<th>RAS/BFT</th>
<th>Project cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>Spain</td>
<td>50 TPA</td>
<td>28-45</td>
<td>BFT</td>
<td>7.5m*</td>
</tr>
<tr>
<td>Germany</td>
<td>15 TPA</td>
<td>49-50</td>
<td>RAS</td>
<td>3.9m**</td>
</tr>
<tr>
<td>Belgium</td>
<td>????</td>
<td>40</td>
<td>BFT</td>
<td>????</td>
</tr>
<tr>
<td>Switzerland</td>
<td>????</td>
<td>87 (converted from Swiss francs)</td>
<td>BFT</td>
<td>????</td>
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<tr>
<td>Spain</td>
<td>25 TPA</td>
<td>50</td>
<td>BFT</td>
<td>0.7m***</td>
</tr>
</tbody>
</table>

*http://www.expansion.com/actualidadeconomica/lujo-y-moda/2016/03/16/56e92ee122601d140e8b46af.html
Some design and engineering considerations
RAS vs BioFloc

RAS
- Autotrophic system: slow microbial growth, but more stability
- Clean water = better stock control
- Less O2 consumption, less CO2 and TSS production (affects OPEX)
- Higher CAPEX
- More complex to setup, but easier to control

BFT
- Mixotrophic: continuous steering of microbial communities
- Poor visibility hampers stock control
- More O2 consumption, more CO2 and TSS production
- Lower CAPEX
- Simpler setup, but requires more management
Energy balances

Consider:

- Building ventilation
- Humidity and CO2 control
- Energy losses due to water exchanges and system flushing
- Loss of latent heat from water surfaces
- Building insulation
- Heat gains by equipment, feed addition
“Industrialising” the designs

- Automation of processes (feeding, water treatments)
- Large tanks allowing for mechanization
- Mechanised crowding and harvesting
- Access to economies of scale
- Main bottleneck: stocking densities
Some last things to consider

1) Indoor shrimp farming today possible under current market conditions – high prices are attainable

2) System productivity *not* limited by carrying capacity, but **stocking densities**

3) RAS equipment may be 35-50% of CAPEX. Biofloc equipment about 15%.

4) Compared to finfish aquaculture. Land, infrastructure and building costs for shrimp will be higher.

5) Can your business survive a 100% sales price drop?

6) Are you willing to invest in solving current bottlenecks?
Thank you for your attention

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