

The Story Behind the Numbers: Issues Impacting Production

**Dr. George Chamberlain
Global Aquaculture Alliance**



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Global Aquaculture Alliance

- 🌐 Dr. George Chamberlain has been president of the Global Aquaculture Alliance since its inception in 1997. He is a co-founder of the organization.
- 🌐 With broad experience in aquaculture, Chamberlain helped establish Integrated Aquaculture International in 2004. Now called iAqua, the company owns and manages breeding, nutrition and production facilities in Asia and the Americas.
- 🌐 Chamberlain is a former president of the World Aquaculture Society.
- 🌐 Chamberlain has developed shrimp feeds and production systems for Ralston Purina Co. and Monsanto.

***If you want to go fast, go alone.
If you want to go far, go together.***

African proverb



Mr. Alex Ko, Grobest Group

- Grobest is one of Asia's biggest and oldest aquaculture groups. Founded in 1974, Grobest Group operates 30 companies in nine Asian countries, including sales and logistics support in the USA. Grobest's expertise includes hatchery, feed manufacturing, farming, and processing.



Tilapia in China: Alex Ko

- 2017 has been a change for tilapia. U.S. demand *stopped growing*. (But good demand is still there.)
- Chinese tilapia comprises a little over 90% of the frozen tilapia imports to the U.S. In China, the market price at the pond level is at the cost of production, so the tilapia farmers aren't happy. Supply is plentiful. Demand isn't sufficient to lift prices, so prices for 2017 have been flat.
- Competition among the Chinese tilapia processors has been fierce both for buying the raw material from farmers and for getting the sales. Tilapia processing plants now are running at 85% to 90% of capacity.

Mr. Liu Rongjie, Chairman Hainan Xiangtai Fishery Co., Ltd.

- Hainan Xiangtai Fishery is located in the south of China, in Hainan Island. It has seven subsidiaries including broodstock, farming, feed and processing.
- From 2012, Xiangtai exported more than 1,200 containers to 30 countries. It is committed to supply the highest quality farmed seafood products to the world.



Tilapia in China: Mr. Liu

- From 2015 until now, the market for tilapia is in a downturn:
 - Negative consumer perception: Consumers think tilapia are farmed in poor conditions, but they are actually managed very well.
 - Pricing: Tilapia compete with pangasius, which has a lower cost of production.
 - Exports; Chinese production of tilapia dropped by 20% this year. Total export and U.S. export volume increased, but export value and profit remained the same as last year.
- Future trends:
 - Building consumer confidence in tilapia through certification, active engagement in improvement programs and adding traceability codes to products.
 - Offering technical service to help farmers manage more effectively from the beginning.
 - Expanding marketing within China to increase domestic consumption.

Pangasius in Vietnam: Ms. Binh

- Due to low prices last year, pangasius production declined at end of 2016 and the first quarter of 2017, but it recently started increasing.
- Production of pangasius is mainly limited by red spot disease and bacillary necrosis of pangasius (BNP) disease, but farmers are learning to manage these with a combination of prebiotic and continuous removal of sludge from the pond.



Mr. Ma Jia Hao, Chairman Guangzhou Liyang Bio Tech Company Ltd.



Liyang outdoor larval rearing system



Guangzhou Liyang Bio Tech Company Ltd. operates large shrimp hatcheries and provides ecological products and services through 300 chain stores and 1,600 technicians.



Shrimp in China: Mr. Ma

- Shrimp farming in China is in a very difficult period. The era of easy shrimp farming is gone forever.
 - Environmental deterioration
 - Water quality remediation systems and products are needed.
 - Broodstock genetics
 - Future breeding programs should be oriented to select for greater resistance to environmental stress.

Mr. Chen Dan, Chairman Guangdong Evergreen Conglomerate Co., Ltd.

- Founded in 1998 as a private enterprise group, focusing on hatchery, feed manufacture, farming, processing, real estate development, financial sector and port operations.
- Owning dozens of subsidiaries, which are located in Guangdong, Guangxi, Hainan, and Fujian, Evergreen is one of the top 500 Chinese private companies.



Shrimp in China: Chen Dan

- 2017 Status

- Larval quality has dropped, and the success rate at growout has dropped to about 50%.
- Shrimp feed production is 1.2 million tons, similar to 2016.
- Shrimp production is declining 20% to 0.9 million tons, due to environmental problems and germplasm degradation.
- Export volumes are dropping because domestic prices are higher than international markets.
- Shrimp farming area is increasing, especially in the north of China.
- About 50% of the shrimp raw material for Chinese processing plants is imported.

- Future trends

- Greater investment is needed in environmental controls such as designated farming zones and standardized farm management.
- Chinese breeding companies are selecting lines adapted to the local environment.
- Hatcheries need to tighten operational standards to improve larval quality.

Mr. Maple Hung, VP of Global Marketing Sheng Long Bio-Tech International Co. Ltd.

- Founded in 2003, Sheng Long Bio-tech International Co. Ltd. specializes in manufacturing and marketing of aquatic feeds and animal health product as well as shrimp breeding.
- It is one of the top 3 shrimp feed producers in Vietnam. Its three feed mills have an annual capacity of 250,000 metric tons of shrimp and fish feeds.
- Its three shrimp hatcheries have an annual capacity of 3 billion postlarvae.



Shrimp in Vietnam: Mr. Maple Hung

- Disease
 - White spot virus, early mortality syndrome and White Feces disease continue to cause economic loss, but the business is growing.
- Vannamei
 - Fast growth of vannamei in Vietnam, due to access to SPF postlarvae, vannamei's tolerance of wide salinity range and short distance to the China market.
- Monodon
 - Some farms are shifting to monodon due to higher prices.
- Growout technology
 - Improved pond results with semi biofloc and zero water exchange with probiotic culture.

Dr. Loc Tran, Director Shrimp Vet Laboratory, Vietnam

- Expanded farming area
 - Shrimp farming is expanding and “low salinity” farming protocol has been adopted in areas of 0-5 ppt.
- New technology, farming protocols
 - “CP” model: 1,000 m² plastic lined pond with shading, 20-40% water exchange/day, multi-phase culture, nursery, polyculture, siphoning, probiotics, feed additives, etc.
- Better genetics
 - In the last one to two years, the ADG of several lines improved a lot. Now with a typical earthen pond (70 pcs/m²), shrimp can reach 15 grams in 50 to 60 days.
- Downside
 - Mixed diseases in hatcheries and shrimp farms
 - Farmers’ lack of finance and technology, unpredictable weather, new diseases (white feces disease)



Loc Tran on Shrimp Diseases in Vietnam

- White spot virus
 - No major change from previous years. This year with a lot of heavy and unpredictable rain, WSSV seems more widespread in the Mekong.
- Early mortality syndrome:
 - Lessened this year, probably due to less sunshine and hot weather and greater management experience.
- EHP
 - Increasing with many cases detected in hatcheries and shrimp ponds. Causing slow growth.
- White feces disease:
 - A bacterial disease that causes severe damage to shrimp GI and HP at DOC 20-70, resulting in slow growth. WFD is strongly associated with pollution and excess algae which lead to blooms of bacteria on the pond bottom.

Shrimp in India

Panchu Duraisamy, GAA

- Exports
 - In 2016-17, India exported 434,484 metric tons. In 2017, total farmed shrimp production is likely to exceed 600,000 metric tons valued at \$6 billion.
- Production
 - Vannamei constitute >90% of cultured shrimp; black tiger < 10%
 - Expanding production area, especially conversion of freshwater fish farms in Andhra Pradesh and conversion of monodon farms in the states of Orissa and West Bengal.
 - Diseases (WSSV, white feces, EHP) remain the foremost challenge. EMS *not* reported.
 - Management trends include increasing use of nurseries and shrimp toilets.
- Antibiotic residues
 - Detention of exports in the U.S. & EEC has driven initiatives by MPEDA, EIC, and CAA to register and monitor inputs to farms and hatcheries, increase pre-harvest testing and require registration of all farms. Around 40 unlicensed shrimp hatcheries were closed recently.

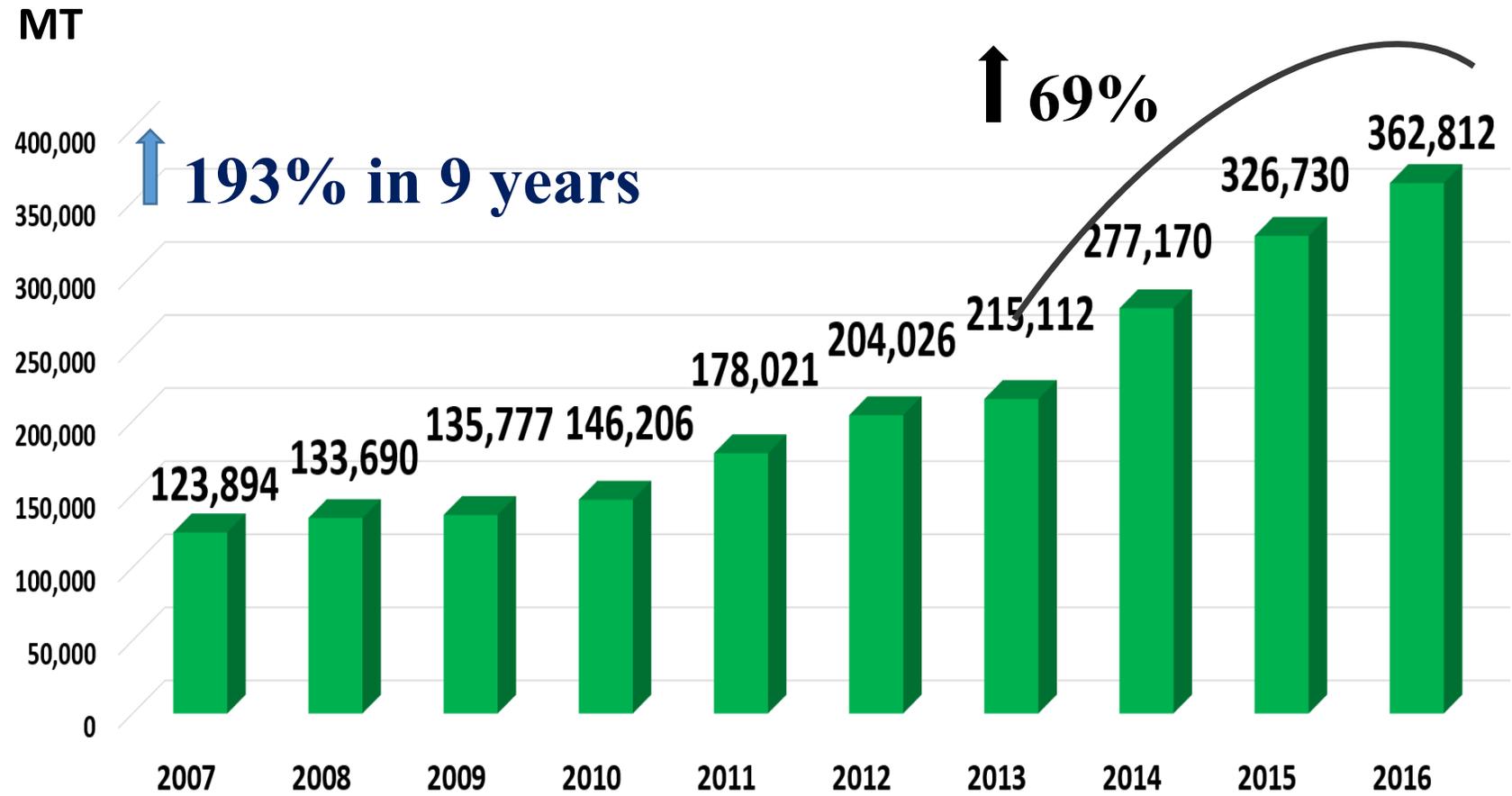


Shrimp in Ecuador: Rodrigo Laniado



S.O.N.G.A.

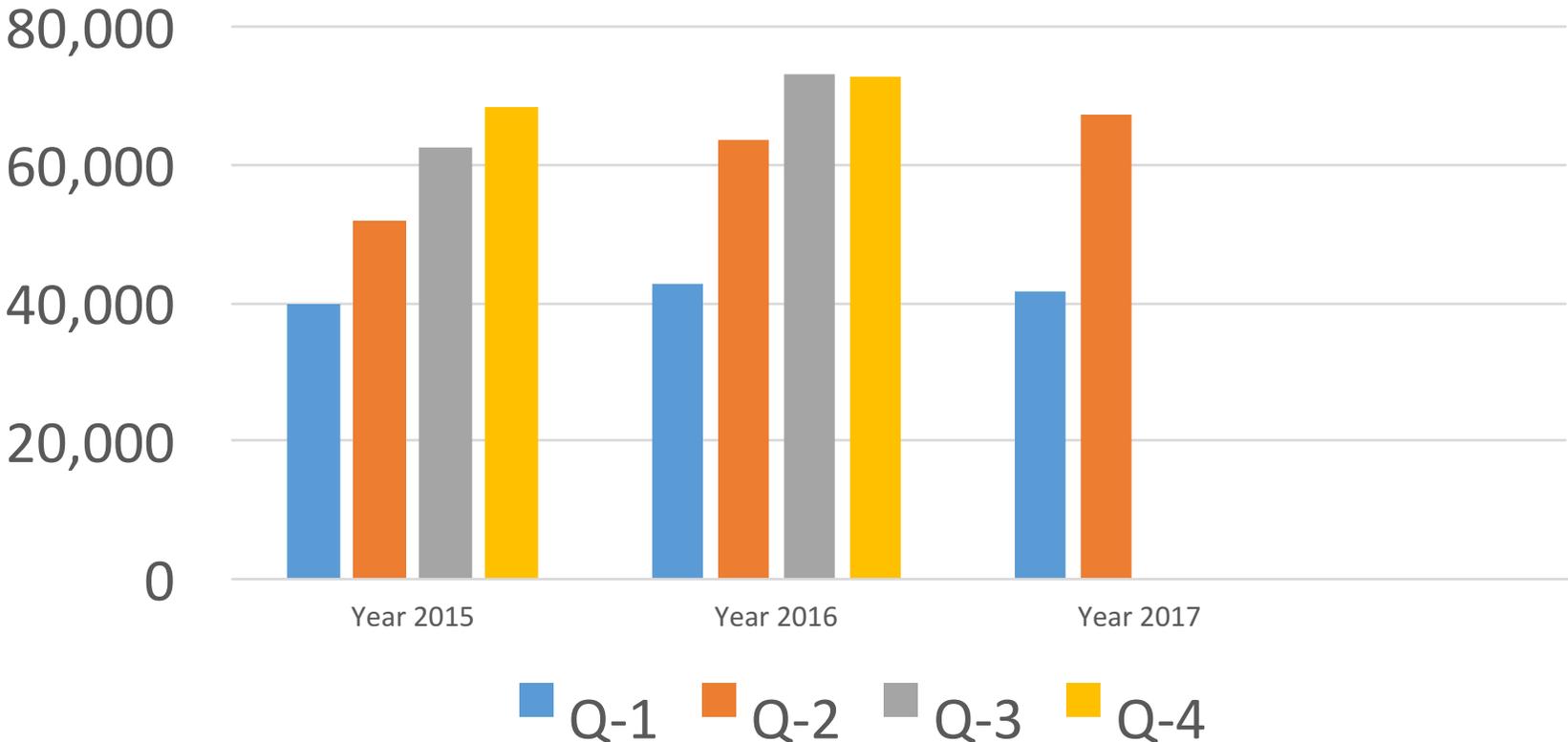
- Ecuador should export 420,000 metric tons, an increase of about 11% over last year.
- In general, our “open ecoshrimp” production model is working well.



Shrimp in Thailand

Rittirong Boonmechote, Thai Union Group

Production continues to recover.
2017 may be up 5%.



President of Global
Shrimp Business Unit

Shrimp in Thailand:

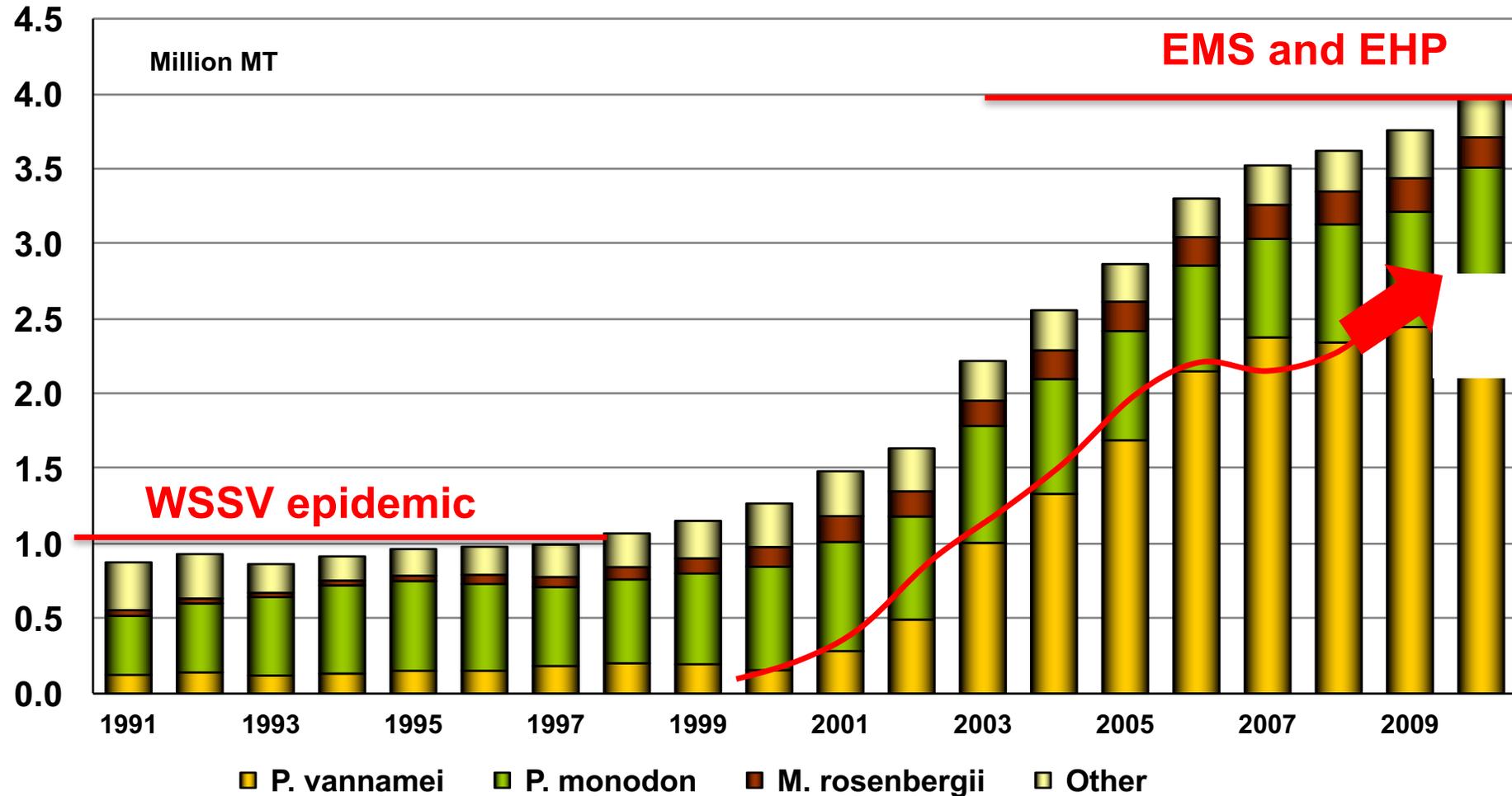
Robins McIntosh, Senior VP, CP Group

- Thailand has stalled a bit — probably just going to be a bit over 300,000 tons, which is the same as 2016.
- EHP has not been controlled, and too much infected material is still getting out of the hatcheries. More work needed on carriers and improved diagnostics.
- Shrinkage in culture area from 70,000 hectares of ponds in 2010 to as few as 10,000 hectares now.
- Efficiency is much higher: 70 day cycles, 15 to 20 tons per cycle, three to four cycles/year.



Impact of Disruptive Technology:

WSV epidemic, introduction of SPF vannamei, and quadrupling of production

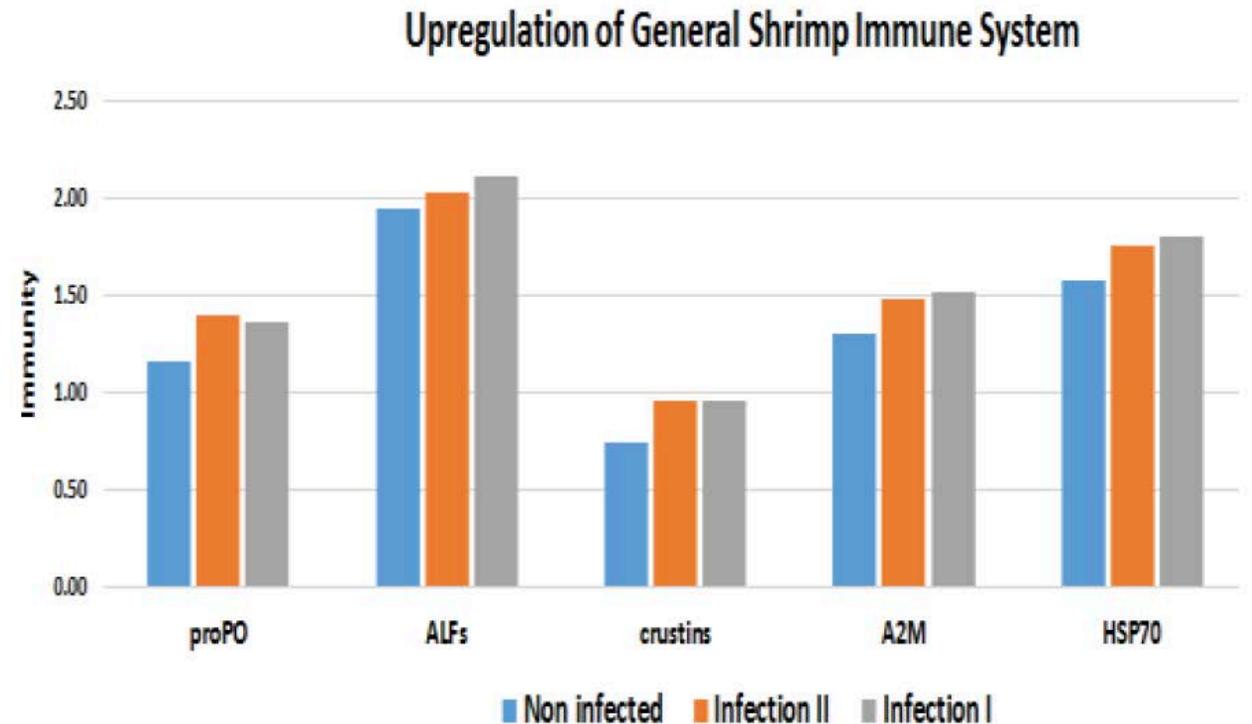


Sources: FAO (2013) for 1991-2011; GOAL (2013) for 2012-2015.

Robins McIntosh: What is the next disruptive technology?

- Until 2012, the focus was breeding for growth, then for disease control. But now, I see opportunities to pump up the immune systems of shrimp to deal with more challenging culture conditions.
- The other alternative is development of more controlled intensive culture systems with greater discipline in sanitation, hygiene and biosecurity.

Shrimp with up-regulated immune genes are more tolerant



Conclusions

- Collaborative approach helps. *If we want to go far, we must go together*
- Repeated themes of environmental deterioration and increasing bacterial and parasitic diseases like EMS, WFD and EHP in major production areas of China and Southeast Asia.
- Overall, the growth of shrimp farming is slow. Ecuador and India continue to expand, but this is tempered by contraction in China.
- Disruptive technologies are needed to overcome the current bottlenecks.
 - Breeding shrimp to be more resilient to challenging environments
 - Intensifying production in more controlled environments