Clean Seas

World Aquaculture Society
Kagoshima

16 October 2013
Who Is Clean Seas?

- Located in South Australia
- Established in 2005 to propagate Southern Bluefin Tuna.
- Clean Seas also farms Seriola lalandi. Production peaked at 4000 tonnes per annum in 2008/9 before sales and fish health problems.
- Now predominantly a yellowtail or Hiramasa farmer rebuilding the business to 1500 tonnes per annum and then onto 3000 tonnes per annum.
- Located at Port Lincoln and the Spencer Gulf in south Australia.
- Southern Bluefin Tuna is in suspension however targeted larval rearing improvements will be investigated.
Clean Seas operates grow out facilities at Port Lincoln and a hatchery at Arno Bay.
Suspension of Tuna Program

- Clean Seas’ medium term focus is on expanding its Yellowtail Kingfish production on a profitable basis
- In the interim, Clean Seas’ Tuna propagation program has been put on hold
  - The mature Tuna broodstock are a very valuable asset that would take 8 years to replace. SBT do not breed until 10-12 years of age.
  - The Tuna broodstock are being maintained at Clean Seas’ Arno Bay facilities in South Australia.
- Clean Seas will consider a return to Southern Bluefin Tuna propagation once it is generating sufficient financial returns to support the program
- Clean Seas is grateful for support received from Seafood CRC, Fisheries Research Development Corporation and Primary Industries South Australia for larval rearing research in early 2014
- In the longer term SBT propagation could return subject to resolving key issues in juvenile production.
Tuna Strategy

- Limited larval rearing, focusing on yield to weaning.
- Very keen to see a replacement to using live fish larvae as part of the weaning strategy.
- The major stumbling block is the duration of egg supply, only one month per year.
- Imagine what could be achieved with six months egg supply per year.

- Our focus is to establish reliable fingerling production and then look at locating that fingerling production closer to warm waters. As well as exploring the opportunities in South Australia.
- We will look at joint venturing this part of the business.
Yellowtail Kingfish Growth Strategy

- Clean Seas maintains a pool of genetically selected and genetically diverse broodstock for spawning. Currently using F1 broodstock.
- Able to produce fingerlings at any time of year
- Target market for Yellowtail sales is predominantly Australia and Europe.
- The key is production efficiency and we are focusing on the following areas:
  - Genetic selection.
  - Fingerling quality, timing and size.
  - Feed performance in growout.
  - Parasite control, particularly flukes.
  - Knowing what is a healthy yellowtail.
Hatchery & Broodstock Complex
Selective Breeding Program and Fingerling Producer

- Established F1 broodstock based on mass selection. Utilizing DNA tracking to maintain genetic diversity from generation to the next. University of Sunshine Coast in Queensland, Australia provides genetics support.
- Currently selecting the F2 broodstock.

- In conjunction with the Australia Seafood Co-operative Research Centre we have investigated and resolved jaw deformity issues in yellowtail.
  - We now produce one fish for every one sent to sea.
  - No grading for jaw deformities.
  - Yields in semi commercial trials have been as high as 20% from egg to fingerling.
  - All larval rearing is now in recirculation systems.
  - Next step is to improve yellowtail fry feeds to ensure adequate Taurine status.
Taurine Deficiency

- Taurine the magical nutrient
- Clean Seas lost considerable stock and financial capacity over three years due to low Taurine in fish feeds.
- One feed company supplied fish feed with levels as low as 0.11% Taurine in the feed.
- The feed company never monitored Taurine levels in the feed and their formulation standards did not require a minimum Taurine content.
- National Research Council 2011 publication, Nutrient Requirements of Fish and Shrimp, states that Yellowtail have a Taurine requirement and it is likely to be in the range of 0.5%.
- In 2012 Clean Seas unilaterally supplemented the feeds with Taurine by top coating the feeds with 0.5% Taurine.
- The recovery of the fish was outstanding.
- For the sake of $20 per tonne it cost us 20 million dollars.
Pathology

Hose pipe lymphocytic enteritis

Thin emaciated fish, green livers, disrupted cholesterol manufacture
Response to Taurine Supplementation

Wild Seriola had levels of 500-600 mg/100g

Taurine supplementation at Time zero
Health Improvements

Fish Mortality in percentage per month for the winter months.

2013 fish healthier than ever and back to levels seen in 2008.
Growth of new season Yellowtail Kingfish is excellent

- Year class 13 fish introduced in November 2012 continue to do well
- Low mortality - survival rate 91%
- Outstanding growth rates due to improved fish health and feed quality
- Year class to date Food Conversion 1.9:1.0 – on target with earlier years
New Era for Nutrition Companies

- The days of feed companies only supplying protein, fat content and a glossy brochure are over.
- Feed companies need to remember that they are nutrition companies and no marketing companies.
- Feed companies also need to be more proactive in their market in ascertaining the health status of the fish that they feed.
- As in other sophisticated agriculture industries the customer deserves a full nutrient specification and some warranties on the content as specified.
- Supporting performance documentation should be properly presented and peer reviewed as would be any scientific claim.
- Feeds should be designed with the farmers level of risk management considered, especially when the feed companies expect the farmer to take the risk.
- A farmer cannot evaluate the risk in the feed when all they are provided is a glossy brochure with elaborate claims.
Flukes  Skin, Gill and Blood

- We are using Hydrogen Peroxide 250ppm for skin and gill fluke
- Praziquantel bath for occasional treatment of gill fluke.
- Strategic Bathing at the end of Winter and Summer, Double bathes to reduce juvenile reinfection.
- Fallowing of juvenile sites to reduce gill/skin fluke infestation.
- Begun looking at Skin Health, trialling products to look at mucous thickness.

- Monitoring egg output of blood flukes to target treatment of adults. So far appears to be an Autumn and Winter peak of egg release.

- What are the benefits of freshwater bathing?
- Does Japan use ingredients to minimise juvenile settlement on Seriola.
Health Monitoring

- Clean Seas has strengthened the health monitoring program.

- Monthly focus on fish health.
  - Particularly liver Taurine levels
  - Haematocrit
  - Blood parameters, building a database
  - Blood fluke egg releases
  - Parasitism and general gross pathology
Suggested Interest Group
What is a healthy Yellowtail?

- Focus on
  - Skin Health
    - It is so important in prevention of disease and parasitism.
  - Gut Health
    - Barrier against infection.
  - Bone mineralization
    - Many other cultured species have fallen into the problem of bone deformities. Eg. Salmon
  - Eye Integrity
    - Many other fish have ended up with cataract issues eg. Salmon
- Blood parameters as an indication of Health Status
  - Such a valuable tool in medicine to understand health status. Our Kingfish appear to have high potassium levels in the blood, compared to wild stock.

Maybe an interest Group could be formed as part of WAS Asia Pacific
  Sharing strategies on evaluating above
  Sharing information gathered on above
  All done by Skype or another internet mechanism.
  I am happy to help set it up.
WAS 2014

- Adelaide in June 7-11, 2014
- We will be having a yellowtail session and a Bluefin Tuna session. Any suggestions on content.
- Cleanseas will conduct tours of their hatchery operations.
THANK YOU

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