Market Opportunities
For
Shellfish Aquaculture

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15+ years in seafood consulting and market research

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Shellfish Marketing Agenda
The view from 30,000 feet

- World seafood supply demand trends
  - Forecast world demand
  - Japan
  - China
  - Europe
  - United States
- World cultured shellfish production
- U.S. shellfish culture issues/opportunities
- Marketing opportunities for Alaska
Forecast World Seafood Demand

Source: Int'l Food Policy Research Inst.

Japan

Japanese Seafood Supply

Trending Lower

Million Metric Tons
Japan: Supply/Demand Trends

- Japanese population approaching zero growth will then shrink
- **Per capita** seafood consumption declining
- **Household** seafood spending declining
- Still a major shellfish importer
  - 18,770 MT of clams in 2003
  - 8,192 MT of oysters

Japan 2020
A Shrinking Market

<table>
<thead>
<tr>
<th>Million Tons Round Weight</th>
<th>2000</th>
<th>2020</th>
</tr>
</thead>
<tbody>
<tr>
<td>8.50</td>
<td></td>
<td></td>
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<tr>
<td>8.40</td>
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<tr>
<td>8.30</td>
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<tr>
<td>8.20</td>
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<td>8.10</td>
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<tr>
<td>8.00</td>
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<tr>
<td>7.90</td>
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<td>7.80</td>
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<td>7.70</td>
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<tr>
<td>7.50</td>
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</tr>
</tbody>
</table>

China
China Seafood Supply

Imports
Aquaculture
Fisheries

China 2020
Strong Future Demand

2000 Total Additional Tons Required

Source: International Food Policy Research Institute

China's urban households consume less staple food and more poultry, seafood, oils and dairy products

<table>
<thead>
<tr>
<th>Food Item</th>
<th>1990</th>
<th>2001</th>
</tr>
</thead>
<tbody>
<tr>
<td>Grain</td>
<td>229</td>
<td>176</td>
</tr>
<tr>
<td>Vegetables</td>
<td>366</td>
<td>384</td>
</tr>
<tr>
<td>Red Meat</td>
<td>49</td>
<td>57</td>
</tr>
<tr>
<td>Poultry and Eggs</td>
<td>246</td>
<td>28</td>
</tr>
<tr>
<td>Fish and Shrimp</td>
<td>18</td>
<td>22</td>
</tr>
<tr>
<td>Vegetable Oil</td>
<td>13</td>
<td>11</td>
</tr>
<tr>
<td>Dairy Products</td>
<td>11</td>
<td>28</td>
</tr>
<tr>
<td>Refrigerator owned per 100 households</td>
<td>29</td>
<td>82</td>
</tr>
</tbody>
</table>

Source: China Statistical Yearbook
China’s rural households still rely on staples

<table>
<thead>
<tr>
<th>Food Item</th>
<th>Rural Residents</th>
<th>Urban Residents</th>
</tr>
</thead>
<tbody>
<tr>
<td>Grains</td>
<td>224</td>
<td>176</td>
</tr>
<tr>
<td>Vegetables</td>
<td>945</td>
<td>956</td>
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<tr>
<td>Red Meat</td>
<td>32</td>
<td>42</td>
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<tr>
<td>Poultry and Eggs</td>
<td>17</td>
<td>33</td>
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<tr>
<td>Fish and Shrimp</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Vegetable Oil</td>
<td>12</td>
<td>18</td>
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<tr>
<td>Dairy Products</td>
<td>3</td>
<td>26</td>
</tr>
<tr>
<td>Refrigerators owned per 100 households</td>
<td>14</td>
<td>82</td>
</tr>
</tbody>
</table>

Source: China Statistical Yearbook

China: Supply Trends

- “Zero growth” policy for coastal fishing
- Aquaculture production will continue to increase sharply, primarily in fresh fish species
- China will need to import more seafood to sustain demand
- Entry into WTO will end tariffs by 2007

China: Demand Trends

- Urban consumer market increasing
- Growth (and consolidation) of retail
- Growth in middle class (with disposable income)
- Demand for upscale seafoods
  - Shrimp
  - Lobster
  - Live fish
Europe

European* Seafood Supply

*EU 15 + Iceland and Norway (Trade + product weight)

Forecast European Demand
U.S. Cultured Shellfish Production

<table>
<thead>
<tr>
<th>Year</th>
<th>Oysters</th>
<th>Blue mussel</th>
<th>Clams</th>
</tr>
</thead>
<tbody>
<tr>
<td>2002</td>
<td>8000</td>
<td>6000</td>
<td>1000</td>
</tr>
<tr>
<td>2001</td>
<td>7000</td>
<td>5000</td>
<td>800</td>
</tr>
<tr>
<td>2000</td>
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<td>1999</td>
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<td>3000</td>
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<td>1998</td>
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<td>1991</td>
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<td>1</td>
</tr>
<tr>
<td>1990</td>
<td>25</td>
<td>5</td>
<td>0.5</td>
</tr>
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</table>

Source: FAO

U.S. Molluscan Aquaculture

Strengths

- Farmed mollusks are “ocean friendly”

Farmed Mollusks Rate High with Environmental Groups

- Blue Ocean Institute – “Farmed clams, mussels, oysters and bay scallops…top choice.”
- Monterey Bay Aquarium – “Farmed clams, oysters and mussels…best choice.”
- Environmental Defense – “Farmed abalone, clams, mussels and oysters…best choices.”
U.S. Molluscan Aquaculture

Strengths

- Farmed mollusks are “ocean friendly”
- Mollusks have good nutritional profiles
- Mollusk prices are generally stable

Weaknesses

- Negative publicity regarding toxins
- Strong reliance on ethnic markets
- Some growing areas “anti-aquaculture” or polluted
- Some products not “consumer friendly”
- Production data not readily available

Opportunities

- U.S. Seafood market is growing
Future U.S. Seafood Demand

Population growth and changing demographics alone will require an additional 3.3 billion pounds (round wt.) by 2020. Greater supply and low prices could push demand even higher.

U.S. Seafood Demand in 2020

How much more supply needed?

U.S. Molluscan Aquaculture Opportunities

U.S. Seafood market is growing

Away-from-home seafood growth will outpace other proteins
Future U.S. Seafood Demand

Growth in both Retail and Foodservice

- Growth % 2000 vs 2020
- Beef, Pork, Poultry, Seafood
- Away from home, At home

Source: USDA ERS

U.S. Molluscan Aquaculture
Opportunities

- U.S. Seafood market is growing
- Away-from-home seafood growth will outpace other proteins
- Good export markets

U.S. Mollusk Exports 2003

- Abalone
- Clams
- Oysters
- Mussels
- Metric Tons, $'000

Source: USDA ERS
U.S. Molluscan Aquaculture Opportunities

- U.S. Seafood market is growing
- Away-from-home seafood growth will outpace other proteins
- Good export markets
- Processing/packaging technology will provide added safety

U.S. Oyster Consumption

- Reported U.S. per capita consumption: .20 lbs
- 2002 ex-farm value of $53.5 million
- Consumption likely under-reported
- 15% of consumers eat 85% of total*
- Average consumer 18-49 male in coastal area*
- 10% drop in price raised demand by 25%*

*University of Florida consumer survey 2001
U.S. Clam Consumption

- Total U.S. consumption of 156 million pounds (edible weight) in 2003
- 2002 reported cultured production of 10 million pounds (meat weight)
- Reported ex-farm value of $10 million
- Cultured geoduck a high-value export

U.S. Scallop Consumption

Source: NMFS
Some Fearless Forecasts for Shellfish Growers

- Demand for oysters, mussels, clams and scallops will grow
- Technology applied to shellfish safety will mitigate trade/consumer fears
- Retail products will need to be case ready
- Central processing facilities need to achieve economies of scale
  - Contract growers
  - Co-op processing/marketing

Conclusions

- Strong demand for seafood in general should help mollusks
- Mollusks are undermarketed
- Need new trial among younger population
- Niche markets, niche products (value-added) needed

Alaska Shellfish Aquaculture Advantages/Opportunities

- Greater siting opportunities than lower 48
  - Unpolluted
  - Fewer "view" issues
- Utilization of processing infrastructure
- Sales synergy with established companies
- Capitalize on "Alaska" and local branding
Alaska Shellfish Aquaculture
Advantages/Opportunities

- Development of contract growing, co-op or integrated models
- Small-scale “family” businesses
- Become world leader in red crab culture
- Proximity to Asia via air cargo

Alaska Shellfish Marketing
Opportunities

- Local markets
- National markets
- Niche markets
- Export markets
- Take market share from Canada
Market Studies on the Net


Thank you