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Backgrounder

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Land-based Closed-containment Aquaculture

Background: Population and income growth has created a shortage of food fish world-wide, and there is continuing pressure for aquaculture to meet this demand

Marine Netpen Aquaculture: Has massive impact on the inshore marine environment, on wild Atlantic salmon populations, and on other species affected by aquaculture's wastes, pesticide impact on other species, and escapes of farmed fish on critically low numbers of wild Atlantic salmon in the regions where net-pen operations exist. No discharge limits exist for netpen operations.

Advantages of Land-based Closed-containment systems

- 99.8% of the water used to grow salmon in closed containment facilities is recycled, minimizing the amount needed by the industry.
- 99% of fish wastes and phosphorus reclaimed and available for fertilizer use
- Using sterile water greatly reduces the need to use antibiotics and pesticides. In addition, chemicals, pesticides and diseases are kept out of the environment – and cannot impact wild creatures.
- Significantly fewer harsh chemicals needed as no sea lice problem
- High biosecurity, with ZERO escapes
- Allows movement away from environmentally sensitive marine areas. These facilities can provide economic growth in communities, without sacrificing the environment.

Present situation of Atlantic Salmon Land-based Production Facilities

- First production facilities about to enter operation
    - Namgis First Nations (BC) – 470 tonnes/yr
    - Sustainable Blue (NS) – 375-500 tonnes/yr
    - Langsand Laks (Denmark) – 4,000 tonnes/yr
    - UK projects – starting at 1,000 tonnes/yr
- Experimental commercial production of Atlantic salmon now being undertaken as far afield as Shandong, China and Normandy, France, with more planned in Chile, and western North America

Technology in support of land-based Production

- Equipment is quickly becoming viable and reliable
- Control of all aspects, including nitrates, CO2, O2, solids, etc. is part of the land-based system, making it of interest to the industry
- Filtration and water process equipment to support unrivalled health and biosecurity now available
    - Freshwater Institute, a pioneering research facility on land-based closed-containment, has grown fish over 10 years with no need for antibiotics or pesticides

- Closed-containment systems able to increase aquaculture on limited water supplies 5 to 100-fold
- Effluents become an asset, allowing value-added products instead of being a negative pressure on the environment
- Packaged systems of 500 tonnes and 1,000 tonnes now emerging

Atlantic Salmon Federation and Land-based Aquaculture

- ASF, in partnership with the Freshwater Institute of Shepherdstown, WV, undertook a scientifically monitored grow-out trial of farmed Atlantic salmon in a commercial scale, land-based containment system.
- The 24-month growout trial, using Saint-John River strain, proved highly successful, with the product receiving rave reviews from Seattle chefs in blind-tests, with preference for ASF product over netpen salmon
    - Growth rate was six months in advance of salmon grown in netpen culture, and harvest of premium salmon at 4 kg. size
    - No vaccination, no issues of disease, and no use of antibiotics and pesticides.
    - No escapes, or salmon found in effluent flow
    - 89 percent of salmon survived to be harvested
    - Feed conversion was 1.09 kg to 1 kg gain.
    - Operating cost was similar to that of netpen operations, approximately $3.90 to $4.00 per kg. of head-on gutted salmon.

Near Future for Land-based Atlantic salmon aquaculture

- ASF has entered into an agreement for further testing of Atlantic salmon
- Within 18 months commercially raised closed-containment Atlantic salmon will be on the market in North America
- Namgis facility especially will allow open scrutiny of performance and costs of a commercial-sized operation. Also built on a modular basis to upscale production in next few years.
- Trials with other strains – Gaspe, and Chinook (derived from Gaspe over 40 years) will continue
- Predictions are that land-based aquaculture operations are economically viable at the 3,000 tonne/yr scale

Consumer Acceptance

- In a blind taste test in Vancouver, chefs preferred, and raved, about the quality and taste of the product
- Commercial growers see a viable market among consumers interested in a product superior in taste, healthy and environmentally sustainable.

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