



October 2014

Volume 1 Issue 3

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CRYOPRESERVED GONAD-EXTRACTED MILT FROM ONE MATURE SALMON MALE CAN BE USED TO FERTILIZE UP TO 1 MILLION EGGS

Cryogenetics has taken total gonad extraction to a new level to give the highest possible fertilization output from each male. AquaBoost™ SpermCoat was developed for diluting milt removed during gonad extraction, and this product fully integrates with and complements the other products in the AquaBoost™ range for improving the fertilization potential of aquatic species. SpermCoat is used for dilution and storage of gonad extracted milt for fresh use in the hatchery as well acting as a robust transportation media for shipment to Cryogenetics for cryopreservation.

How will SpermCoat improve efficiency and reduce cost?

Our R&D has established that one male salmon in prime reproductive condition can fertilize 1 million healthy eggs and therefore, even allowing for a higher than average egg-to-harvest mortality, as few as 8 healthy males can be used to comfortably produce annual harvest biomass generation of 25,000 tonnes.

This is easily repeatable and can be scaled up or down, to suit individual production regimes and previous biological performance. The reduction in numbers of

breeding males required will free-up broodstock tank capacity, providing a useful cost saving. A bigger benefit is that if you have your genetically “perfect male” that exhibits all the desired traits you are looking for such as growth, disease resistance, flesh quality, colour and so forth, creating large numbers of related fish that provide a consistent production output. Consistency of high quality fish are what many markets are looking for and is a strong base from which to achieve best product price.

With many developments we will not stop there. Cryogenetics is now testing the use of AquaBoost™ SpermCoat also on other salmonids with already good results on Arctic charr and Rainbow trout, and other fish species will become a natural progression thereafter.



AQUABOOST™ EXTENDER IS SUCCESSFUL IN TRIALS WITH BALLAN WRASSE

As a part of the project funded by FHF (Norwegian Seafood Research Fund), Cryogenetics has contributed with both our products and knowledge in the treatment of milt from Ballan Wrasse to achieve the best possible fertilization result. Ballan Wrasse is used within aquaculture to eat parasitic sea lice that can accumulate upon sea-cage grown salmonids and is seen as an important resource in dealing with the parasite without resorting to chemical intervention.

The use of AquaBoost™ Extender was seen to have a positive effect on short-term storage of Ballan Wrasse (*Labrus bergylta*) milt. Milt diluted with this extender in the FHF-project, “Production of Ballan Wrasse” showed an average

fertilization rate of 90% after 5 days of storage.

The Wrasse-project was performed in cooperation with Nofima at Sunndalsøra and is now extended to cover tests for use of AquaBoost™ Extender and cryopreservation of milt from Lump sucker (*Cyclopterus lumpus*) as well. Lump sucker is another interesting species of “cleaner fish” and Cryogenetics is proud to contribute to these important developments. These tests also prove the diversity and the potential uses across aquatic species of Cryogenetics products.

“In 2010, we suggested that each SquarePack® could fertilize at least 1,500 eggs, but now in 2014 we say that each SquarePack® is capable of fertilizing at least 4,000 eggs.”

CRYOPRESERVED SALMON MILT EXCEEDS THE 200MILLION EGG FERTILIZATION

In the last four years we have seen a steady growth in demand for our unique, industrial scale cryopreservation services across all of in regions in which we operate.

This growth is illustrated in the graph below.

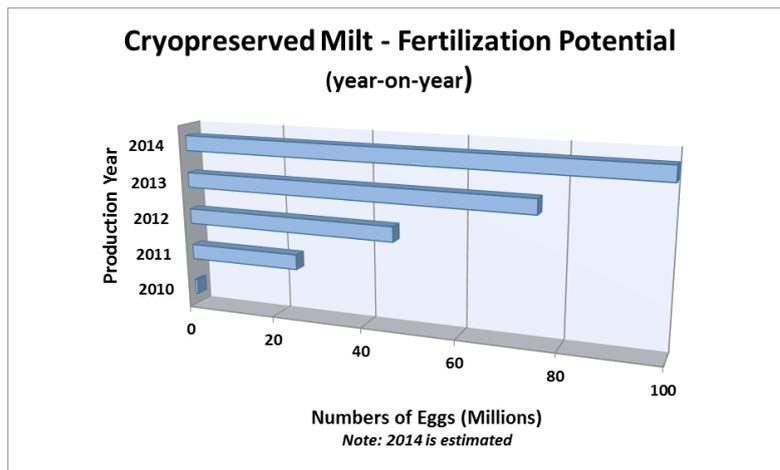
Inclusive of estimated figures for this year's breeding season, we will have cryopreserved enough salmon milt since 2010 that has, or has had, a fertilization potential in excess of 200 million eggs.

The production of our patented milt cryopreservation containers; *SquarePack®*, in all regions has seen steady growth since their launch into the market place with more customers selecting the services of Cryogenetics as part of their production strategy.

In 2010, we suggested that each SquarePack® could fertilize at least **1,500 eggs**, but now in 2014 we say that each SquarePack® is capable of fertilizing at least **4,000 eggs**.

This development has been brought about by being able to conduct more trials with our protocols and SDM6 Photometer, as well as further refine our AquaBoost™ series of solutions that provide for stronger, yet repeatable, fertilization results year-on-year.

Our clients have been hugely supportive, allowing access to their data and materials, which has accelerated the whole improvement process. We will not stop there either; but continue to grow, refine and streamline our processes to continue to deliver the highest levels of customer service.



NEW MEMBER IN THE CRYOGENETICS FAMILY

Cryogenetics is proud to announce that Cryogenetics Technologies UK Limited was founded in Scotland in July 2014.

This division will also serve as a sales and service center in EU and Europe. Scotland and UK is centrally located in Europe and has year-round operations within aquaculture and fisheries.

Russell Ferguson runs the UK office and with his background in aquaculture, reproduction and engineering will use this experience to further enhance the competence in the organization and assist to grow the business.



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"Preserving Aquatic Genes"

Cryogenetics is a Norwegian based biotech company that develops and offers products and services, aiming for a better reproduction and higher fertilization of aquatic species.

By being a leader in applying biotechnological processes, Cryogenetics gives their customers cost reducing solutions suited their production.

Cryogenetics has units in Canada, Chile, Norway, UK and USA.



CRYOGENETICS HEAD OFFICE HAS MOVED INTO "NEW" FACILITIES

Cryogenetics in Norway has now completed the move into new office and laboratory suites.

The new facilities are housed in the former Nestle Factory in Hamar which has undergone major restoration and preservation work over many months.

The building is in a conservancy zone which means that much could not be altered from the original external structure, but inside, we could go state-of-the-art!

This move matches our business ambitions in many ways; conservation as well as preservation. In addition, in the days of Nestle, the factory produced condensed milk. As it happens the Norwegian word for milk and milt is the same: "melk". This nuance cannot be lost in all of our work involving milt as part for our industrial scaled improvement in fertilization potential and the preservation of aquatic genes.

The office facilities and R&D lab are finished and in use. We are now applying the finishing touches to our new biosecure fin fish cryopreservation facilities. Our team at Hamar will be ready to receive milt for cryopreservation when the spawning season for salmon starts this autumn.



The factory chimney at the old Nestle factory.