

Pancreas Disease Success reported by Landcatch Natural Selection

Remarkably high levels of resistance to pancreas disease (PD) have been recorded in unvaccinated Landcatch fish, reared on a Norwegian farm, next to vaccinated stock from a local source which suffered severe PD-inflicted losses.

Mortalities in the unvaccinated stock were less than 5% compared to losses of between 15% and 40% in the vaccinated fish. Landcatch Natural Selection (LNS), the Scottish international salmon breeding company who supplied the unvaccinated stock to a farm at Hordaland, Western Norway, have placed smolts in equally challenging PD environments in other areas of Norway over the last three years and each time have shown impressively high levels of resistance to infection and very low, or indeed no, resultant mortalities.

“This is the first time we’ve been able to give concrete mortality and survival figures in the face of what was a severe PD attack,” said Alan Stewart, Business Development Director, LNS, “although previous studies in Ireland have indicated similar resistance.

“Our smolts were introduced to the farm in autumn 2008, alongside PD vaccinated smolts from another source. Once they’d settled, they showed typically good growth patterns. During the following summer (2009), when the fish were averaging 2kg, and thus of very considerable economic value, PD struck the whole area.

“The fact that the Landcatch fish had not been vaccinated helped to ensure that any differential in mortality between the two stocks demonstrated the value of genetic enhancement alone, and was unrelated to vaccination. The results were remarkable with the Landcatch smolts incurring losses of between 2% and 5% while the vaccinated fish suffered mortalities of between 12% and 44%.”

LNS collaborates with experts in virology such as Dr David Graham of the Northern Ireland Veterinary Institute, where the PD virus was first isolated and world renowned research institutions such as The Roslin Institute, which cloned Dolly the sheep, to investigate genetic resistance to virus infection. Identification of quantitative trait loci (QTLs) associated with resistance to PD and their use in breeding will further enhance the high level of resistance observed in Landcatch stock. This process was pioneered by LNS for IPN resistance.

“Landcatch are continuously looking to add resistance for specific diseases such as PD to the range of traits which we take into account as part of our individual broodstock fish selections.” said Alan Stewart. “If QTLs for PD resistance are found,

then it will be possible to further increase the level of inherent genetic resistance to PD at every subsequent generation of our four-year breeding cycle.

“Even this year, however, the commercial eggs and smolts which we are now releasing are derived from the families with the same genetically enhanced resistance to viral disease, observed in the Landcatch stocks at Hordaland.

“While it would be wrong, obviously, to claim that PD has been conquered, our field data to date indicates that using Landcatch stock can be expected to significantly reduce losses from this scourge.”

Please see attached PD mortality chart.

Additional notes for editors:

1. Landcatch Natural Selection has already gained widespread recognition within the industry for the IPN resistance of their commercial stocks. This work, carried out in conjunction with The Roslin Institute, led to the identification of genetic markers for a QTL which accounts for over 80% of the variation in IPN resistance. Fish with the resistant variant of the QTL have better survivability when exposed to IPN in freshwater or seawater. Every generation of Landcatch eggs and smolts are selected to have a resistance built-in at the IPN QTL. This is an industry first!
2. PD is primarily a chronic disease of the heart and skeletal muscles, although the pancreas is also affected. It has become a severe problem to salmon farmers. The virus is believed to be transferred horizontally from fish to fish in the sea and can be responsible for major economic losses. In Norway for example, where it is particularly serious, losses in 2009 have been estimated to exceed \$150 million.

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