Flavobacteriosis resistance for rainbow trout

Flavobacteriosis, also known as Rainbow Trout Fry Syndrome (RTFS) is a major problem in rainbow trout production worldwide. It is widespread, occurs frequently and can cause high mortality and wounds in fry and larger fish in freshwater hatcheries and on-growing sites. Antibiotics are often used to treat stock affected by flavobacteriosis.

AquaGen has identified two genetic markers (QTLs) with significant correlation to flavobacteriosis resistance. The markers will be used in rainbow trout egg production in Norway, UK and Chile from early 2017.

Genomic tool for rainbow trout developed

AquaGen has implemented a genomic tool that uses thousands of markers in order to select for disease resistance in rainbow trout. In collaboration with Affymetrix and the US Department of Agriculture (USDA), a high density SNP-chip capable of genotyping 55,000 SNP markers from one individual fish in one analysis has been developed. It is through the use of this SNP-chip that gene markers for IPN- and flavobacteriosis resistance could be identified.

Challenge model for *Flavobacterium psycrophilum*

In 2014, AquaGen started its work on resistance to flavobacteriosis. A crucial part of this work was the availability of an experimental challenge model developed by a group of scientists at the University of Stirling. A total of 1,500 fry were challenged with *Flavobacterium psycrophilum*, and subsequently genotyped by the SNP-chip.

Two QTLs for flavobacteriosis resistance discovered

A QTL search resulted in the discovery of two major QTLs for resistance to flavobacteriosis. Both alone and in combination, the two QTLs have a significant effect in reducing mortality from flavobacteriosis in rainbow trout.

The survival among fish with the worst (qqqq) and the best (QQQQ) combination of markers was 31% and 84%, respectively. Eggs selected for flavobacteriosis resistance, will include two to four of the favorable flavobacteriosis resistant variant Q (Figure 2). The frequency of the beneficial markers is low to moderate in AquaGen rainbow trout stock, which means there is a huge potential for improving resistance.

Figure 1. Rainbow trout raised in seawater.

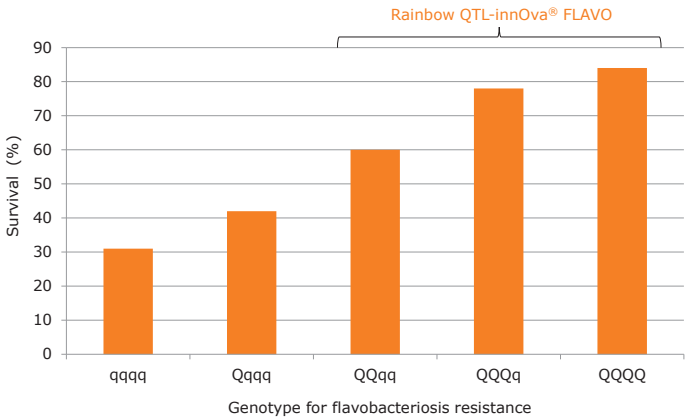

Figure 2. Effect testing of flavobacteriosis in 3-4 grams rainbow trout fry. 1500 fish, from 100 families were challenged with Flavobacterium psycrophilum. The difference in survival between the worst (qqqq) and best (QQQQ) combination of markers for flavobacteriosis resistance was over 50%. Rainbow QTL-innOva® FLAVO includes 2-4 copies of the favorable flavobacteriosis resistant variant Q.

Products with flavobacteriosis resistance:

- AquaGen® Rainbow QTL-innOva® FLAVO
- AquaGen® Rainbow QTL-innOva® IPN/FLAVO

Advantages of Rainbow QTL-innOva® FLAVO:

- Flavobacteriosis protection through the entire life of the fish
- Greater predictability in production of rainbow trout

AquaGen
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