

Genetic chip will help salmon farmers breed better fish

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Researchers have developed a gene chip that will help salmon farmers select the best fish for breeding. Credit: Landcatch Natural Selection

Atlantic salmon production could be boosted by a new technology that will help select the best fish for breeding.

The development will enable salmon breeders to improve the quality of their stock and its resistance to disease.

A chip loaded with hundreds of thousands of pieces of DNA – each holding a fragment of the salmon's genetic code – will allow breeders to detect [fish](#) with the best genes.

It does so by detecting variations in the [genetic code](#) of each individual fish – known as [single nucleotide polymorphisms](#) (SNPs). These variations make it possible to identify genes that are linked to desirable physical traits, such as growth or resistance to problematic diseases, for example sea lice infestations.

Salmon breeders will be able to carry out the test by taking a small sample of fin tissue.

The chip carries over twenty times more genetic information than existing tools. Similar chips have already transformed breeding programmes for land-farmed livestock including cattle and pigs.

Salmon farming contributes around half a billion pounds to the UK economy each year and provides healthy, high quality food. Worldwide, approximately 1.5 million tonnes of Atlantic salmon are produced every year.

Scientists from the University of Edinburgh's Roslin Institute and Edinburgh Genomics initiative developed the chip with researchers from the Universities of Stirling and Glasgow. They worked with industrial partners Affymetrix UK and Landcatch Natural Selection. The work was funded by the UK's innovation agency – the Technology Strategy Board – and the Biotechnology and Biological Sciences Research Council.

The chip is highlighted in a study published today in the journal *BMC Genomics* and it will be available to breeders and farmers from March 2014.

Dr Ross Houston, of The Roslin Institute, said: "Selective breeding programmes have been used to improve salmon stocks since the 1970s. This [new technology](#) will allow the best breeding fish to be selected more efficiently and accurately, particularly those with characteristics that are difficult to measure such as resistance to disease"

Dr Alan Tinch, director of genetics at Landcatch Natural Selection, said: "This development takes selective breeding programmes to a whole new level. It is an extension to the [selective breeding](#) of [salmon](#) allowing more accurate identification of the best fish to create healthier and more robust offspring."

More information: www.biomedcentral.com/1471-2164/15/90

Provided by University of Edinburgh

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