

Case study: Reducing the negative ecological effects of fish farms

The global challenge

Fish farming is an increasingly important source of fish for human consumption, providing nearly 50% of the fish consumed by people globally, compared to 9% in 1980. However, farmed fish are often fed using wild-caught fish, and taking lots of wild-caught fish from the oceans has negative consequences for ocean ecosystems, with 90% of the world's fish stocks classified as fully or overfished by the UN.

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Approaches to reducing the negative ecological effects of fish farms

These negative effects can be reduced by increasing the use of vegetable-based proteins as food for farmed fish, and farming non-carnivorous fish such as tilapia that do not require wild-caught fish for food. Further opportunities for minimising the impacts of fish farming include changing human diets to reduce the demand for farmed fish, and reducing food waste.

A genetic technologies example

25 years after it was first developed, a variety of Atlantic salmon engineered with genes from another salmon and genes from another fish species that increase how quickly it grows went on sale in Canada in August 2017. These genetically modified (GM) salmon require less food than unmodified salmon to reach a desired size and weight. They have also been engineered to be sterile to reduce the risk of interbreeding with wild salmon if the farmed salmon escaped.

UK facts & figures

- Salmon provides 0.6% of the average person in the UK's daily protein intake
- No GM salmon is currently on sale in the UK
- Current UK regulations require all food sold in the UK consisting of GM organisms or containing ingredients produced by GM organisms to be clearly labelled as GM.

Arguments made in favour of developing GM salmon

- Reduce the amount of wild-caught fish required to produce a given amount of farmed fish
- Reduce production costs for aquaculture companies

Arguments made against developing GM salmon

- Escaped GM salmon could breed with wild salmon if the intervention to make them sterile was not completely successful
- Escaped GM salmon could outcompete wild salmon because they need less food and grow more rapidly
- If lower production costs enable an increase in the total amount of salmon farmed, then this could lead to an increase in the total amount of wild fish caught to feed them.