# AQUAMAX

## Alternative fish feeds for safer seafood, healthy consumers and sustainable aquaculture

**Consumers are generally recommended to increase their fish consumption, to maintain a healthy diet. The worlds' fisheries stagnation and decline struggle to meet this growing global demand for fish. Aquaculture has thus far managed to make up the deficit but its growth is becoming increasingly constrained by the limited industrial supply of fish on which aquaculture feeds are so heavily dependent. In this context, EU has funded AquaMax, a project aiming to develop alternative fish feeds to replace the fish meal and fish oil. Supported under the Sixth Research Framework Programme by 10.5 million, this project will lead to multiple benefits focused on healthier farmed fish and safer consumers.**

Aquaculture as currently practiced in Europe is being increasingly criticised for its over dependence on scarce and frequently polluted marine resources. This is because the feeds used for the major fish species farmed in Europe - Atlantic salmon, rainbow trout, sea bream and sea bass - are composed to a large extent of fish meals and fish oils derived from global marine fisheries that are at best stagnating and at worst declining.

Moreover, marine fisheries can be contaminated with persistent organic pollutants that are de facto present in fish meals and fish oils and so can be transmitted directly from the feeds to the farmed fish and hence to the consumer. Consequently, there is justified concern that the claimed health benefits to consumers derived from eating fish, especially oily fish and including farmed fish, can be offset by risks, however slight, associated with ingesting marine environmental pollutants. This concern is illustrated by some national nutritional authorities recommending that care be taken when consuming fish, especially oily fish, during pregnancy.

Numerous previous studies have investigated and recommended potential alternatives to fish oil and fish meal in fish feeds, most notably the EU Framework 5 - funded projects RAFOA and PEPPA. The former programme established that fish oil in fish feeds containing fish meal could be very largely replaced with vegetable oils; the latter programme established that fish meal in fish feeds containing fish oil could be largely replaced with vegetable meals. However, the extent to which fish oil and fish meal can both be replaced, simultaneously, in fish feeds is far from clear. Moreover, it is axiomatic that such replacement must not prejudice the health and welfare of the farmed fish, it must retain the health benefits of the product and its acceptability and quality to the consumer and, above all, its safety to the consumer.

It was to address and resolve these complex and inter-related issues that AquaMax was established in 2006 as a major integrated project in FP6. The AquaMax project consisted of 32 partners from 14 countries and was completed in 2010 at a total cost of 15.9 (10.5 EU contribution) million euros.

The primary applications of AquaMax have been to develop new feeds that enhance the sustainability of the industry and that ensure minimal levels of contaminants in the product and hence its safety. The health benefits of fish fed the new feeds and their acceptability to the consumer have been demonstrated. These applications have been underpinned by developing an extensive body of basic and applied scientific knowledge. In addition, AquaMax has contributed with knowledge to improve the feed and food legislation as well as nutritional recommendations. Thus, AquaMax has substantially enhanced the visibility of European aquaculture and its supporting research and development capabilities and expertise worldwide.

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