

AQUAMAX

Sustainable Aquafeeds to Maximise the Health Benefits of Farmed Fish for Consumers



With 32 partners from 13 different countries, the integrated project AQUAMAX has for strategic goal to replace as much as possible of the fish meal and fish oil currently used in fish feeds with sustainable, alternative feed resources that are as free of undesirable contaminants as possible. The project aims to include improving contamination detection methods, health benefit assessments for the 'new-diet-based' farmed fish and studies into consumer perception and acceptance.

Background

The European Commission is striving to ensure that the food chain is risk-free at all stages of production and consumption. One of the specific areas of interest is fish feed used in aquaculture across the European Union. Aquaculture constitutes an important sector of European economy, with annual growth rates of approximately 5-9%. In fact, the EU aquaculture industry is second only to its Asian counterpart. As growth of the sector continues, minimizing the potential health hazards associated with fish products has become more urgent. These hazards pertain primarily to marine-derived toxic contaminants of fishmeal or fish oils, entering the food chain through the fish feeds used routinely on a global scale. In 2001, global seafood consumption was estimated at 100 million tons, and a further increase of 65 million tons is expected by the year 2030. It is clear that fisheries will be unable to meet this demand and, as a consequence, the role of aquaculture will become more and more pronounced. To achieve the position where a sustainable aquaculture industry can produce safe and healthy seafood products, the sector has to cope with several important challenges, as shortage of marine resources, the expansion of fish farming which requires the development of sustainable feed resources and the scientific documentation in the whole food chain Environment.

Objectives

The AQUAMAX approach involves initiatives ranging from toxicogenomics and nutrigenomics to a nutritional trial involving pregnant women and infants. The objectives set forth in the project can only be realised through extensive collaboration with a series of partners possessing diverse sets of skills. At the same time, AQUAMAX aims to boost consumer confidence in the sector and its products by addressing a number of concerns in an effective and efficient manner.

The work of the AQUAMAX project is spread over 4 interrelated programmes, corresponding to 4 objectives:

1. Development of feeds based on sustainable alternatives to fish meal and fish oil
2. Health benefits of fish consumption, with a focus on pregnant woman and allergic diseases
3. Safety of fish farmed on the new feeds developed in Aquamax
4. Perception of farmed fish by the public/consumers and the scientists

Results

The AQUAMAX integrated project has:

- developed novel aquafeeds with both fish oil and fish meal largely replaced with sustainable, mainly vegetable materials and tested these new feeds successfully in feeding trials and farm-level demonstrations with salmon, rainbow trout, sea bream and carps;
- developed a finishing diet based on high quality fish oil to ensure where necessary a final product rich in health promoting, long chain n-3 fatty acids;



- shown that the growth performance of fish fed the novel diets and the fish's health and welfare including the impact of veterinary drugs were not notably compromised;
- developed a range of new molecular tools including DNA microchips to understand and assess the performance and metabolic consequences for fish fed the new diets and to explore nutrient x genome interactions;
- developed advanced and applied analytical methodology to ensure that the novel feeds contain minimal or negligible levels of contaminants and to understand the kinetics and effects of transmission of contaminants from feeds to fish and to model organisms, thereby ensuring the safety of the product to the consumer;
- conducted a nutritional trial with salmon fed the new diets in pregnant women, focussing on predictors of atopic disease in early infancy; supported the nutritional trial (in the UK) with a parallel study during pregnancy and early infancy in communities (in China) consuming different amounts and kinds of fish;
- confirmed the quality of fish farmed on the new diets and their acceptance to consumers, and developed a strategy for communicating risks and benefits of the farmed fish to consumers;
- published large numbers of scientific papers in international peer-reviewed journals and extensively disseminated all results and findings in the public domain.

Impact

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. Thus, AquaMax has substantially enhanced the visibility of European aquaculture and its supporting research and development capabilities and expertise worldwide. Indeed, partners from China and India are working alongside academic and SME participants, combining their expertise through studies on the entire food chain, ranging from toxicological investigations to market validation of the new products. The project's impact is therefore significant, contributing to further growth and new employment opportunities for the EU aquaculture industry.

For more information, please visit the website: <http://www.aquamaxip.eu>

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EC contribution: 10.5 million €

Duration: 48 months

Starting Date: 01/03/2006

Partners:

National Institute of Nutrition and Seafood Research (NO), Institut National de la Recherche Agronomique (FR), Institute of Aquaculture, University of Stirling (UK), CSIC Institute of Aquaculture Torre la Sal (ES), Hellenic Institute of Marine Research (EL), Res. Inst. for Fisheries, Aquaculture and Irrigation (HU), Biological Res. Centre, Hungarian Academy of Sciences (HU), Nutreco Aquaculture Research Centre (NO), Institute of Marine Research (NO), DDG Fisheries, Indian Council of Agricultural Research (India), University of Southampton (UK), Institute of Nutrition and Food Safety (China), King's College London (UK), University of Granada (ES), University of the Auvergne, Clermont-Ferrand (FR), University of Uppsala (SE), University of Reading (UK), Istituto Superiore di Sanita (IT), Peipsi Centre for Transboundary Cooperation (EE), Selonda Aquaculture S.A. (EL), Halandor Kft (HU), G. Barka Kft (HU), Alpha Mos (FR), WOW Creative Projects Ltd (EL), Landcatch Natural Selection Ltd. (UK), Technology Crops Ltd (UK), Viviers de France (FR), Teutoburger Olmuhle GmbH and Co. KG (DE), Caditec (ES), Marine Harvest International B.V. (NL), Federation of European Aquaculture Producers (BE)