

AQUABREEDING

Towards enhanced and sustainable use of genetics and breeding in the European aquaculture industry

The Challenge

The European aquaculture industry is a dynamic production sector characterised by a large variety of cultivated species and various rearing environments. Some sectors and larger companies have invested in sophisticated rearing programmes to establish the best possible stock. Elsewhere, this may be limited by a lack of infrastructure or resources. A coordinated review of current breeding practices, knowledge gaps and main stakeholders would enable the industry to identify its research priorities and optimise its performance across the EU.

Genetic improvement represents a crucial area for any industry whose activities depend on the trade of improved “seeds” in both the plant and animal production sectors. Considering the commitments made by the aquaculture sector in this area, the industry can be divided in two. On one side, pioneering companies have developed sophisticated selection programs and are now investing in the application of new technologies to their breeding systems. On the other side are the small producers that have either set up sporadic breeding activities or have not invested at all in breeding and are still using unselected broodstock.

Project Objective

The project examined the potential for successful animal breeding and genomic techniques to be implemented in the Strategic Research Agenda of two aquaculture-related European technology platforms:

- FABRE-TP: Farm Animal Breeding and Reproduction Technology Platform (<http://www.fabretp.info/>);
- EATIP: European Aquaculture Technology and Innovation Platform (<http://www.eatip.eu/>).

Key Points

- To describe the state-of-the-art of breeding techniques, genomics, research findings and socio-economic challenges throughout the European aquaculture industry;
- To define the research priorities of the industry already involved in aquaculture breeding by focusing on current knowledge gaps to develop a strategic plan on industrial research priorities
- To promote the dissemination of knowledge to support a major involvement of the industry in breeding activities;
- To establish an education and knowledge dissemination pro-

EATIP Thematic Area of Relevance

- TA1:** Product Quality, Consumer Safety and Health
- TA2:** Technology and Systems
- TA3:** Managing the Biological Lifecycle
- TA4:** Sustainable Feed Production
- TA5:** Integration with the Environment
- TA6:** Knowledge Management
- TA7:** Aquatic Animal Health and Welfare
- TA8:** Socio-Economics and Management

Key Words

Genomics, Breeding, Aquaculture

Project Information

Contract number:

44424

Contract type:

Specific Support Action

Action Line:

POLICIES-1.3 The modernisation and sustainability of fisheries policies

Duration:

24 months (01/12/2006 – 30/11/2008)

Coordinator:

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gramme through collaboration between academics, breeding companies and industry end-users;

- To reinforce links with FABRE-TP and EATP in view of possible fruitful interactions between these European technology platforms.

Output Highlights

Strategic research agenda

The project consisted of the definition of a strategic research agenda for the aquaculture sector in relation to breeding techniques and the provision of a vision paper defining the needs of the industry within the remit of the Technology Platform on animal breeding.

Breeding Directory

Development of a database/directory on Breeding and Reproduction Aquaculture Network - 140 stakeholders (industry and academics) have committed to support the network and will allow for enhanced co-operation between industry sectors interested in breeding and reproduction.

Technical Handbook

A technical handbook on the Breeding Practices in the European aquaculture industry was developed and outlines the various breeding strategies employed and assessed the extent of their implementation in the European aquaculture industry

Updated species review

A series of Species reviews provided updated information on the state of the art of breeding and reproduction for aquaculture species considered to have a relevant economic weight or presenting a development potential at the European level (species included – cod, salmon, brown trout, rainbow trout, charr, pacific oyster, seabass, seabream and turbot).

Breeding vision

Guidelines on an AquaBreeding Vision were developed to highlight the key objectives of existing and future breeding programs needed to support a vibrant aquaculture industry in Europe.

Research priorities

The main research priorities for industry were identified and were based on the following pillars: market-value traits, health and welfare traits, reproduction, breeding schemes efficiency, sex control, genetic resources and banking, social and knowledge transfer issues.

Training course

A professional training course on the 'Design of breeding programs for aquaculture' was given

The Full Report:

For a comprehensive description of the research project, visit <http://www.aquabreeding.eu/>

Next Steps – Suggested Actions/Follow On



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- While the objectives of the AQUABREEDING project were met a number of needs were identified including future industrial priorities and the need to continue ensuring the implementation of the FABRE and EATIP platforms to support a dynamic and sustainable European industrial breeding sector in aquaculture.