"FINE FISH"

Reduction of malformations of juvenile fish in hatcheries

During 2003-2004, the Federation of European Aquaculture Producers (FEAP) conducted a series of workshops to assess the research needs of Europe's varied fish-farming sectors, better known as the PROFET workshops (TL2006-009). During these gatherings, hatchery managers from across Europe reported high levels of skeletal malformations in fingerlings – juvenile fish about the size of a human finger. Since malformed fish cannot be sold to consumers, and thus have to be discarded, they represent a major source of financial losses for SME hatcheries and growers, which have been estimated at more than €50 million/year.

In addition to direct losses, malformed fish consume more food and thereby decrease production efficiency. Finding ways of preventing malformations has therefore been identified as one of the major research tasks for the European aquaculture industry.

Coordinated by FEAP, the FINEFISH (Reduction of malformations in farmed fish species) project aims to accomplish these objectives, joining ten top European fish hatcheries with scientists specialising in fish development, for a long-range study of the health of young fish.

A series of studies covering the major species in European aquaculture production – sea bream, sea bass, salmon, trout, cod – have been initiated to examine possible causes of malformation.

These studies aim to provide practical guidelines on how to avoid malformations and focus on the following areas:

- **rearing temperatures**, with emphasis on early life stages;
- **nutrition**, with focus on nutritional quality and impact on bone mineralization of both starter and grower diets, and
- **tank environment**, including gas supplementation and hydrodynamics.

All experiments are being performed in small-scale research facilities and will later on be tested and validated under commercial conditions within the participating SMEs.

MALFORMED JAWS IN ATLANTIC SALMON. SOURCE: AKVAFORSK.

The hatcheries will contribute with their know-how from practical fish farming, and recordings within commercial farms are ongoing on the relation between potential causative factors and malformation rates. These recordings will be used to establish benchmarks for the measurement of improvements.

Project acronym:
FINE FISH

Full title of Project:
Reduction of malformations in farmed fish species

EU contract number:
012451

Web-site:
www.finefish.info

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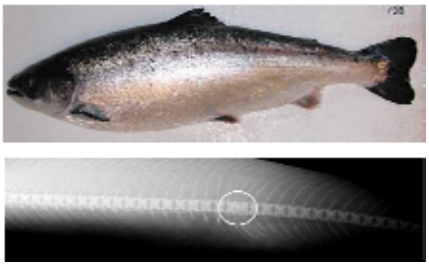
"FINEFISH HAS JOINED TEN TOP EUROPEAN FISH HATCHERIES WITH SCIENTISTS SPECIALISING IN FISH DEVELOPMENT, FOR A LONG-RANGE STUDY OF THE HEALTH OF YOUNG FISH"

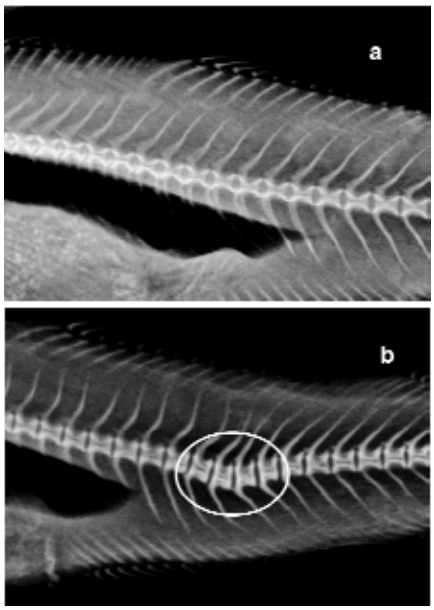
Within a year of starting, FINEFISH has already generated the first versions of the **diagnostic manual** for sea bass and sea bream, as well as for salmon, rainbow trout and cod. Those are now ready to be tested and implemented by the SMEs in the project consortium. The manuals are based on **existing knowledge** at the start of the project and consist of **protocols for the morphological classification of the various malformations**. The manual will be updated during the course of the project.



FUSION OF VERTEBRAE IN RAINBOW TROUT. SOURCE: AKVAFORSK.

The **new knowledge** gained on strategies to avoid malformations will be summarised as guidelines for use in "Best Practise" hatchery operating manuals:

- A general Best Management Practise in Hatcheries
- A Best Management Practise for the reduction of malformations, which will be more detailed and species-specific.



RADIOGRAPH IMAGE OF A NORMAL VERTEBRAL COLUMN IN JUVENILE ATLANTIC COD (A) AND A VERTEBRAL COLUMN WITH LORDOSIS (B). SOURCE: AKVAFORSK.

In order to let the whole European aquaculture industry benefit from this project, the project will give all active members of the European fish farming profession access to the knowledge of the FINEFISH project.

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