

BENEFISH

Evaluating the economic impact of maintaining the welfare of farmed fish

The Challenge

The welfare of fish bred and raised in captivity has been the subject of much media attention recently. Far from the simple creature with a 30 second memory, fish are known to possess the anatomy, physiology and cognitive ability necessary for perceiving harmful stimuli. Furthermore, they demonstrate behavioural responses to pain. As a result, there is now increasing pressure on the regulatory authorities to legislate for fish welfare.

Legislation, however, must be based on sound data and until recently, there has been little information available on fish. The Farm Animal Welfare Council (FAWC) report on the Welfare of Farmed Fish (1996) highlighted a general lack of understanding in the area and the need for further research. Legislation and regulation pertaining to farmed fish welfare requires a detailed understanding of not only the relevant biology and ethical issues, but also of practical matters regarding welfare assessment and monitoring (e.g. operational welfare indicators) and the economic implications of their implementation.

Project Objective

The main objective of BENEFISH was to develop a science based decision analysis model for comparing the biological effects and the economic considerations associated with the adoption/adherence to a welfare standard for fish farming.

Key Points

The project consisted of nine work packages that were divided into project management alongside three RTD blocks as follows:

- To use a set of widely applicable operational welfare indicators in order to define relationships between selected welfare control measures and their consequences for production, quality and consumer perception;
- To estimate the costs and benefits of potential welfare control measures through case studies;
- To develop a decision analysis model allowing comparison between various welfare control measures on the basis of their biological and monetary consequences.

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

Fish welfare, economic modelling, cost and benefits

Project Information

Contract number:

44118

Contract type:

Specific Targeted Research Project

Action line:

POLICIES-1.3 The modernisation and sustainability of fisheries policies

Duration:

36 months (01/02/2007 – 31/01/2010)

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Output Highlights

Welfare actions and indicators

In aquaculture there is a close association between welfare and productivity, though this is not necessarily the case in other long term domesticated farming practices such as chickens and dairy cattle. The consortium identified important and widely accepted welfare indicators which are applicable across species and culture systems. Some indicators, such as mortalities, had very clear implications for productivity while this relationship was less clear for others e.g. fin damage. BENEFISH examined these welfare indicators in a farming and biological context using existing and new data to explore the costs and benefits – both direct and indirect- of monitoring and improving these indicators.

Consequences of indicators in the value chain

As an example: What is needed to improve fin quality in terms of monitoring and changes to management practices? What are the potential direct benefits in production (e.g. food conversion and growth) and the indirect benefits such as improved quality of the end product?

The added value of implementation of higher welfare standards is considered as part of the whole market chain. The consortium included expertise through the entire length of the market chain to determine this added value.

It is widely recognised that the consumer's ethical attitudes to welfare of farmed animals and the the system in which they are produced can impact the entire market chain from farm to fork, BENEFISH therefore also examined the potential impact of fish welfare issues on consumer behaviour, using the existing welfare situation and a range of positive and negative scenarios.

Welfare utilities and bio-economic models

The implementation of improved welfare requires a variety of documentation, monitoring and regulatory aspects from individual farm initiatives through industry and national schemes to Europe-wide initiatives. Such schemes have an attendant cost but also experience benefits through improved image in the market place. The links of the BENEFISH consortium with fish producer organisations, quality mark providers and an welfare-label controller was important for this aspect of the project. BENEFISH also developed bio-economic models for the whole value chain system, from on-farm production to consumer behaviour; this can provide a realistic estimate of the real costs and benefits of improved fish welfare.

The Full Report:

For a comprehensive description of the research project, visit www.benefish.eu and Norway, gave Europe a strong advantage in this high-technology application. There is now worldwide interest in recirculation systems, for freshwater (smolts, tilapia, different perch species, sturgeon) and for marine fish species (turbot, sea bass, sea bream, sole, flounder). The main incentive for this heightened interest is growing environmental concern for the use of water resources, and the discharge of wastewater from fish farms.

Next Steps – Suggested Actions/Follow On



Policy

- The European Parliament's Committee on Fisheries Report ([Aquaculture in the EU: present and future \(2002/2058 \(INI\)\)](#)) published on the 10th December 2002 identified the welfare of farmed fish to be a major concern and called on the Commission to "step up research to pave the way for the development of Community regulations on the Health and Welfare of Farmed Fish". The Council of Europe has drafted [recommendations on farmed fish](#), which were adopted as a Directive by the EU for implementation by all member states. BENEFISH gives fish farmers a



Knowledge Transfer

- In this framework, BENEFISH has helped policy-makers to develop cost-effective measures for regulating fish farming in order to meet consumers' increasing expectations for animal welfare. Moreover, the comprehensive scientific approach to data collection and analysis informed all parties engaged in the regulatory and decision-making process, thereby ensuring that future developments within the industry which optimise animal welfare can be more easily analysed with respect to economic costs and benefits. Finally, the project helped all interested parties to understand the economic implications of welfare management actions and procedures throughout the farmed-fish supply chain.



RTD

- BENEFISH looked for strategies that provide producers and all others in the market chain with an economic incentive to improve fish welfare. This has the potential to give the European aquaculture industry an advantage in the world market through more efficient production methods and higher value of ethically produced fish products.

Related Publications/Projects

Projects:

ECONOWELFARE, WELFARE QUALITY, FASTFISH, EUROPEAN ANIMAL WELFARE PLATFORM

Publications:

BENEFISH Special Issue, Aquaculture Economics and Management, In press