Animal welfare in modern production systems for fish

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Fish welfare – what is it?

The European Food Safety Authority (EFSA)

What is EFSA?

- The European Food Safety Authority. Engages also in feed safety, contagious diseases in animals and animal welfare.
- Risk assessment.
- Independent scientific reports on present and emerging risks in the food area.
- Cooperates with the EU Commission, the European Parliament and Member states.

What is EFSA?

- Started 2002.
- In order to separate risk assessment from risk management.
- As a result of the BSE, dioxin scandals etc.
- Replacing different committées under the Commission, e.g. SCAHAW.
- Localised to Parma.

What does EFSA?

- Scientific evaluations (on request by the KOM, EP or MS) which forms a basis for statutes, directives and decisions.
- Supports research and research cooperation
- Coordinates databases and data collection
- Monitoring ”emerging risks”
- Develops methodologies for risk assessment
- Answers questions

Risk asessment for food safety:

FAO/ WHO Food Standards

CODEX alimentarius

Risk assessment for the import of contagious disease:

OiE

Risk assessment for animal welfare:

efsa

European Food Safety Authority

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European Food Safety Authority

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SPECIES-SPECIFIC WELFARE ASPECTS OF THE MAIN SYSTEMS OF STUNNING AND KILLING OF FARMED ATLANTIC SALMON

Scientific Opinion of the Panel on Animal Health and Welfare

(Question N° EFSA-Q-2006-437)

Adopted on 20th of March 2009

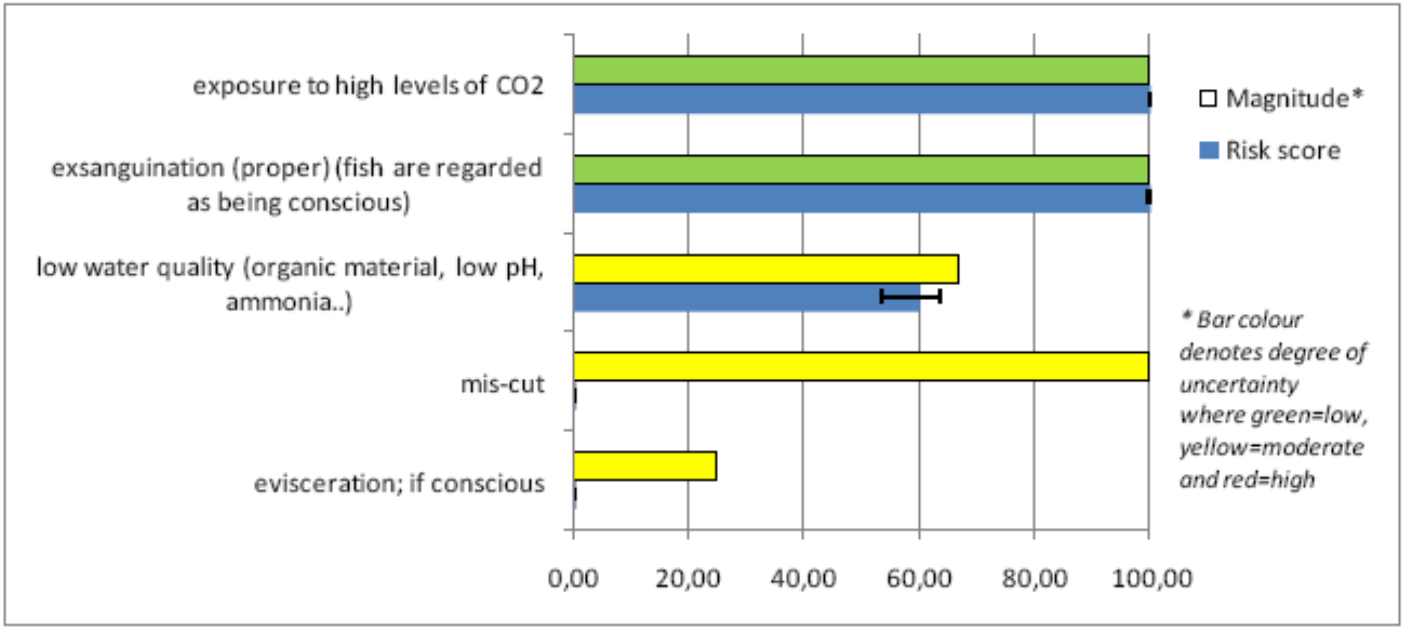

Figure 11. Risk score and magnitude of adverse welfare effect for individual hazards associated with the use of carbon dioxide only (method E) in Atlantic salmon *(Salmo salar)*, ranked by risk score. Black bars show the estimated minimum and maximum values for the risk score, reflecting the uncertainty about the probability of exposure to the hazard.

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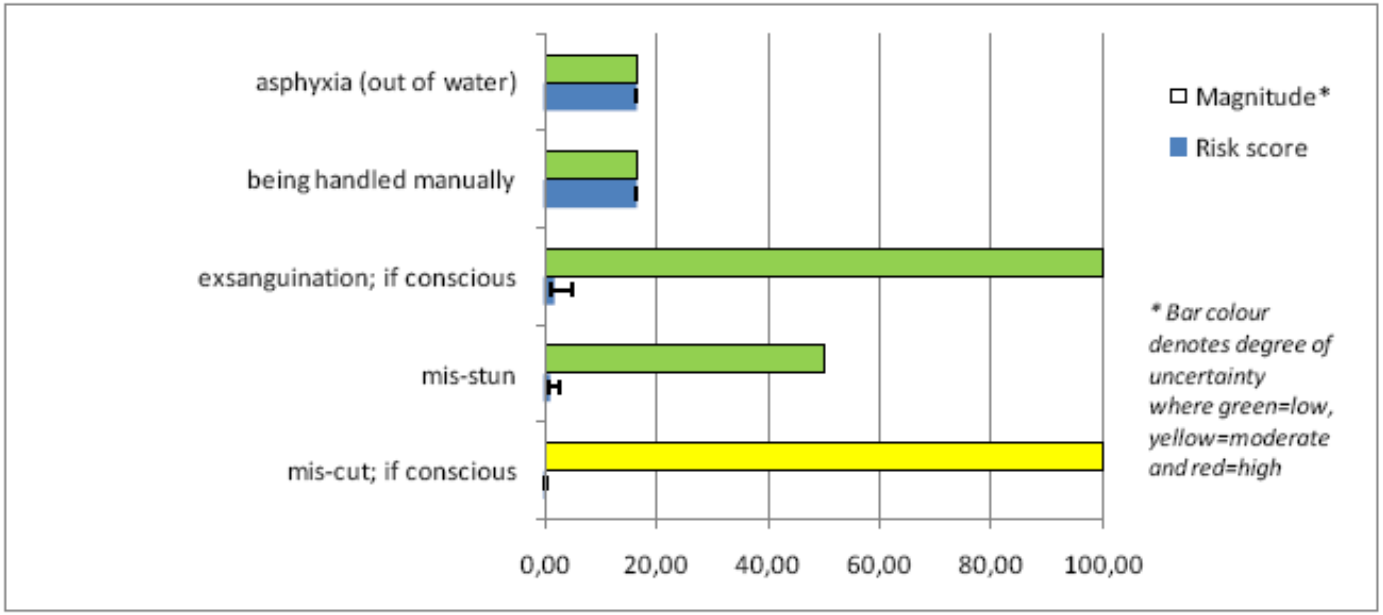


Figure 9. Risk score and magnitude of adverse welfare effect for individual hazards associated with hand fed percussive stunning systems with manual cut (method C) in Atlantic salmon *(Salmo salar)*, ranked by risk score. Black bars show the estimated minimum and maximum values for the risk score, reflecting the uncertainty about the probability of exposure to the hazard.

What is the opinion of EFSA on the ability of fish to feel pain and stress and experience fear?

EFSA is of the opinion that there is scientific support that fish have brain structures implying that they can feel pain and experience fear. However, the knowledge is limited and more research is needed.

Fish may show behavioural and physical resopnses developed to handle stressors. Many of these are similar to those seen in other vertebrates.

Chronic exposure to stress leads to chronic responses such as reduced immunocompetense, lowered resistence to disease, reduced reproduction and growth and eventual death.

It is further concluded that some research indicate that fish may have a nervous system hosting some degree of cognitive ability although our knowledge in this area is limited.

General aim of this project:

Establishing a world class fish welfare platform.

Specific aims:

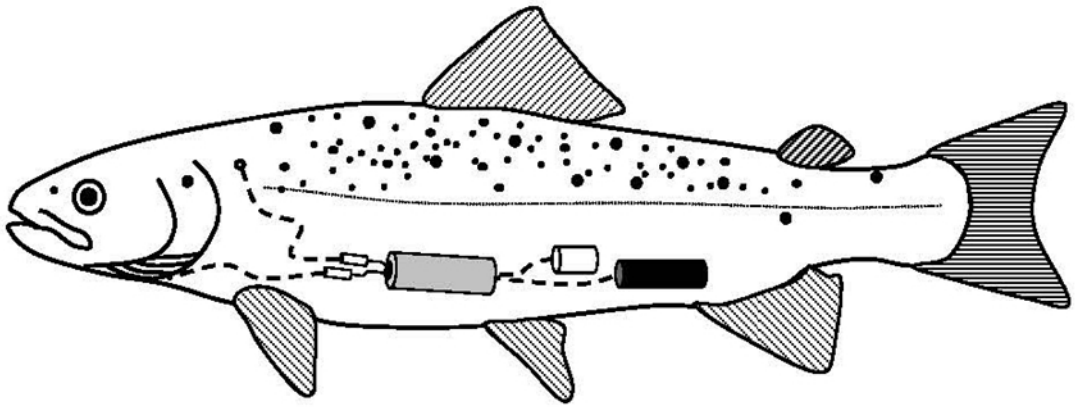
- Obtain physiological data enabling identification of cause and effect
- Quantitative comparison of critical situations for farmed fish
- Specific recommendations and basis for legislation to ensure animal welfare and improve future production and management systems

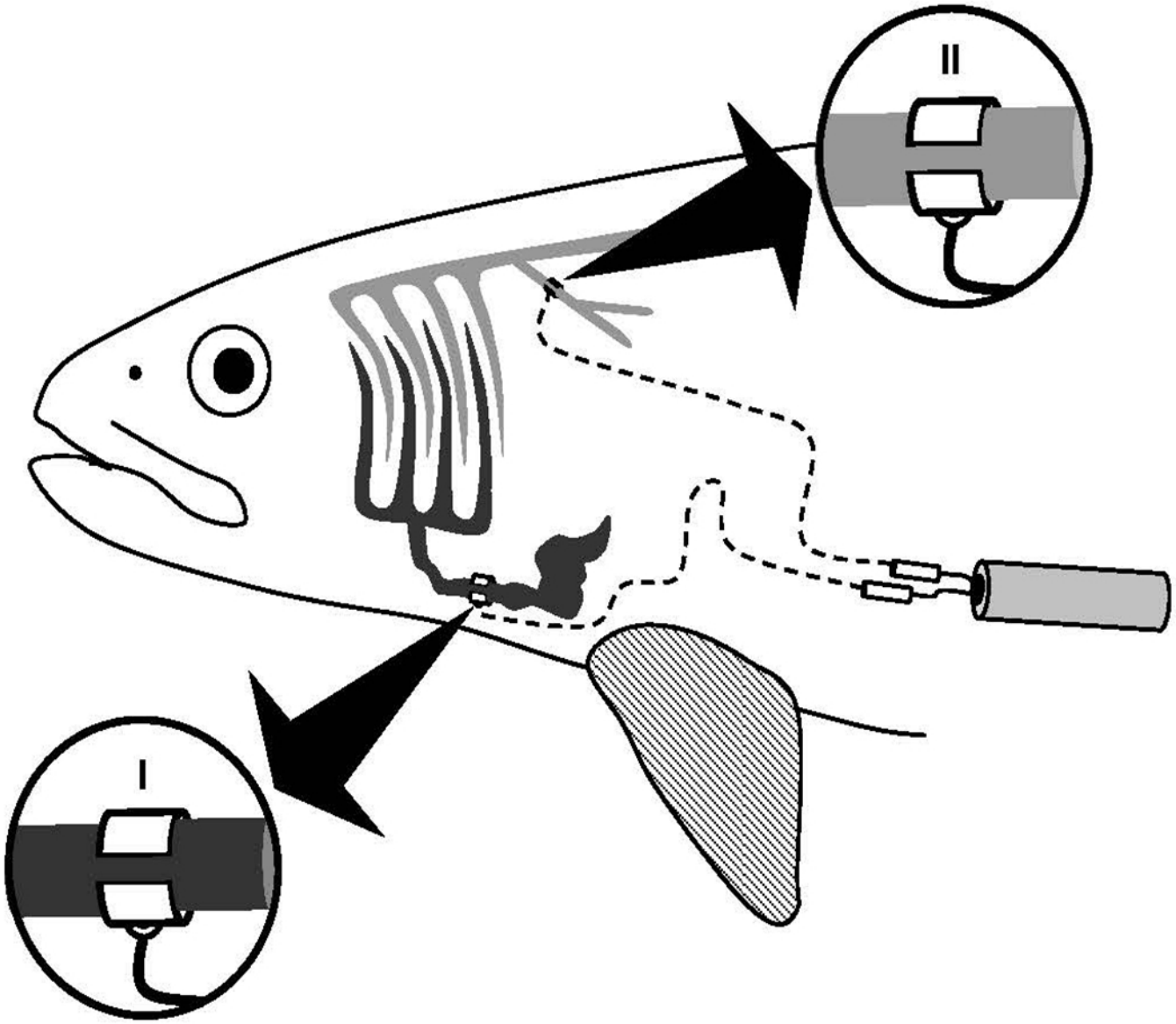
Methods:

- We will look into the fish itself and monitor physiological responses in vivo during commercial production situations in order to understand the causality and severeness of different farming practises.

- Using a telemetric dual-channel Doppler blood flow telemetric system to measure total cardiac output flow, gut blood flow, heart rate and body temperature.

- Using the Ussing chamber technique the intestinal barrier function will be evaluated.

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Four main components of this study:

1. Measure stress responses during normal farming practices in focal fish, using telemetry in combination with data loggers, including cage and land based systems.

2. Measure hormonal and CSN stress indicators as cortisol and transmitter substances, respectively, as well as intestinal barrier functions from fish sampled at fish farms as well as in controlled laboratory experiments.

3. To use controlled experimental laboratory situations with instrumented fish, allowing detailed and advanced measurements in order to understand underlying physiological mechanisms.

4. Use non-invasive techniques to obtain measurements of truly non-experimentally influenced fish in order to obtain representative baseline and stress-free values of heart and ventilation frequency, possible to measure with this technique.

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This project is a collaboration between

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