

6th BioFish Forum

***Organic Aquaculture defined in
Council Regulation (EC) No 834/2007***

**Fish welfare - a key issue for organic
systems standards**

Pino Lembo

FISH WELFARE, DEFINITIONS AND STANDARDS

**Definitions focused on the “quality of life”
hunger/thirst, discomfort, pain/disease,
fear/distress, freedom to express normal behaviour;**

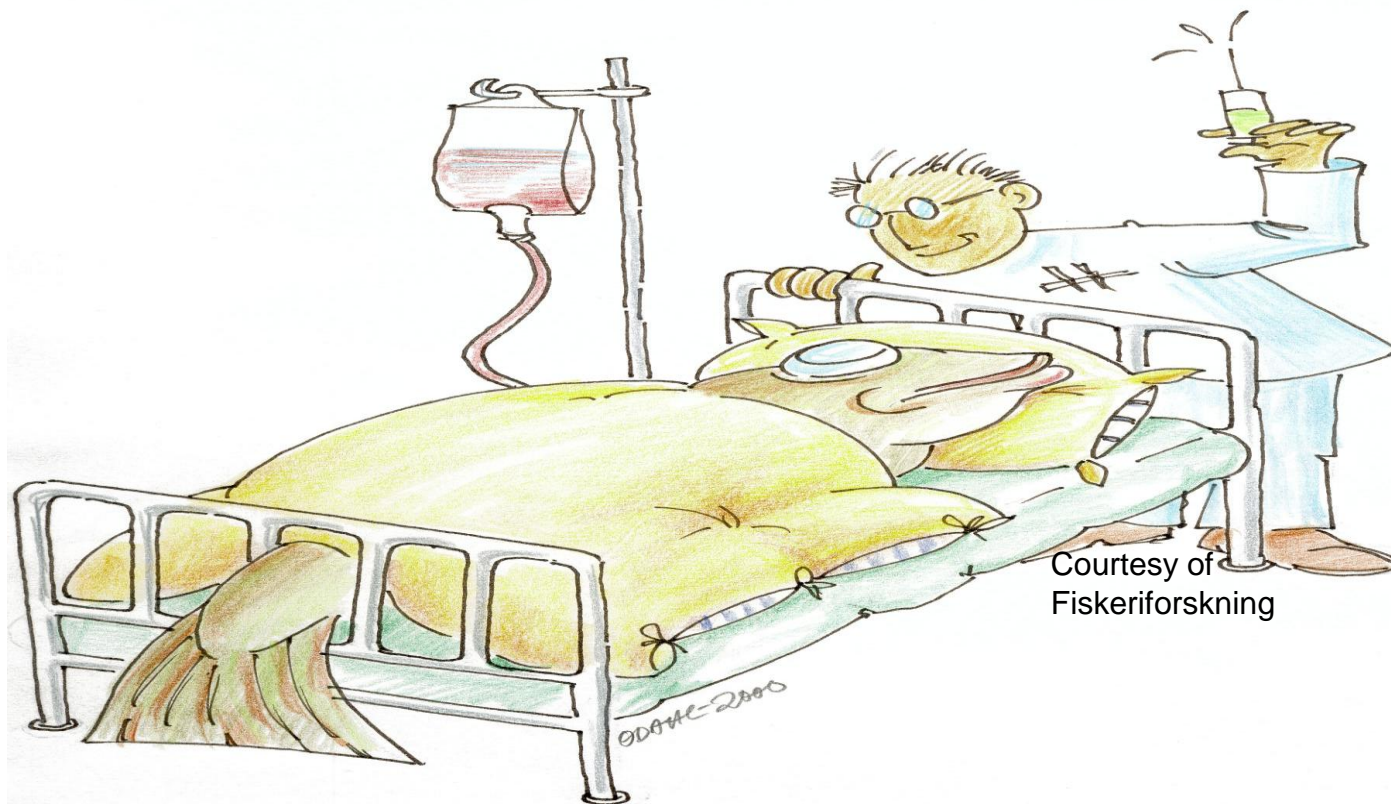
**Measures of stress have been used to evaluate
“welfare”;**

**Measures of behavioural responses to stressors have
been used to monitor “welfare”;**

**Typically, how well an animal compensates to a
“stressor” has been interpreted as a measure of its
overall “health” .**

FISH WELFARE, DEFINITIONS AND STANDARDS

Poor welfare = sick fish = ↑ operating costs



Courtesy of
Fiskeriforskning

FISH WELFARE IN THE ORGANIC REGULATION

The aquaculture animals shall:

- (a) have sufficient space for their wellbeing;**
- (b) be kept in water of good quality with sufficient oxygen levels, and**
- (c) be kept in temperature and light conditions in accordance with the requirements of the species and having regard to the geographic location;**
- (d) in the case of freshwater fish the bottom type shall be as close as possible to natural conditions.**

FISH WELFARE IN THE ORGANIC REGULATION

Handling of aquaculture animals shall be minimised, undertaken with the greatest care and proper equipment and protocols used to avoid stress and physical damage associated with handling procedures.

Slaughter techniques shall render fish immediately unconscious and insensible to pain.

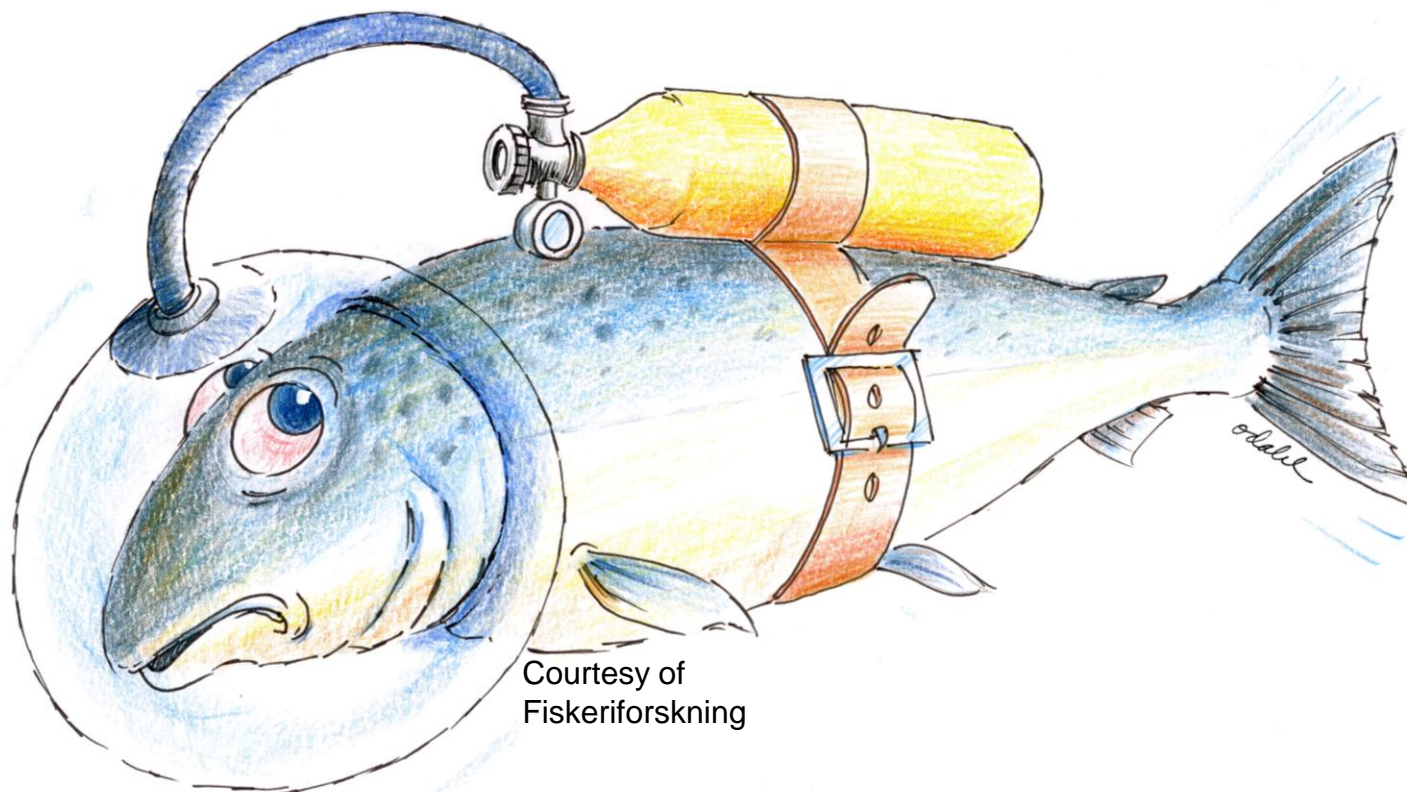
Feeding regimes shall be designed with the priority of the animal health;

FISH WELFARE IN THE ORGANIC REGULATION

Considering the effects of **stocking density** on the welfare of farmed fish:

the condition, such as fin damage, other injuries, growth rate, behaviour, overall health and the water quality **shall be monitored**.

Intensive rearing conditions - ↑O₂



Courtesy of
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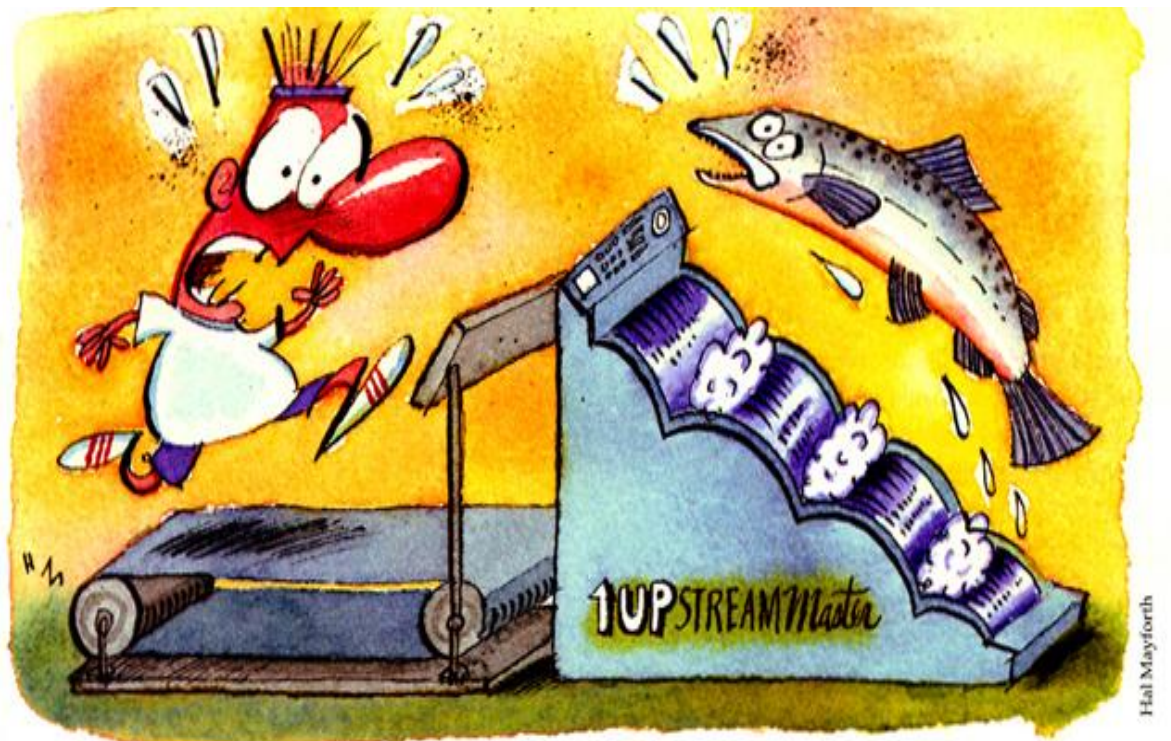
RESEARCH ON FISH WELFARE

"THE WAY FORWARD"

- **Good welfare = healthy fish = ↑ economy**
- **Need to develop protocols that are repeatable and can be readily adapted to present day aquaculture practices**
- **Need to develop procedures that monitor the whole animal response (*i.e. energetic cost*) to changing husbandry or environmental conditions**

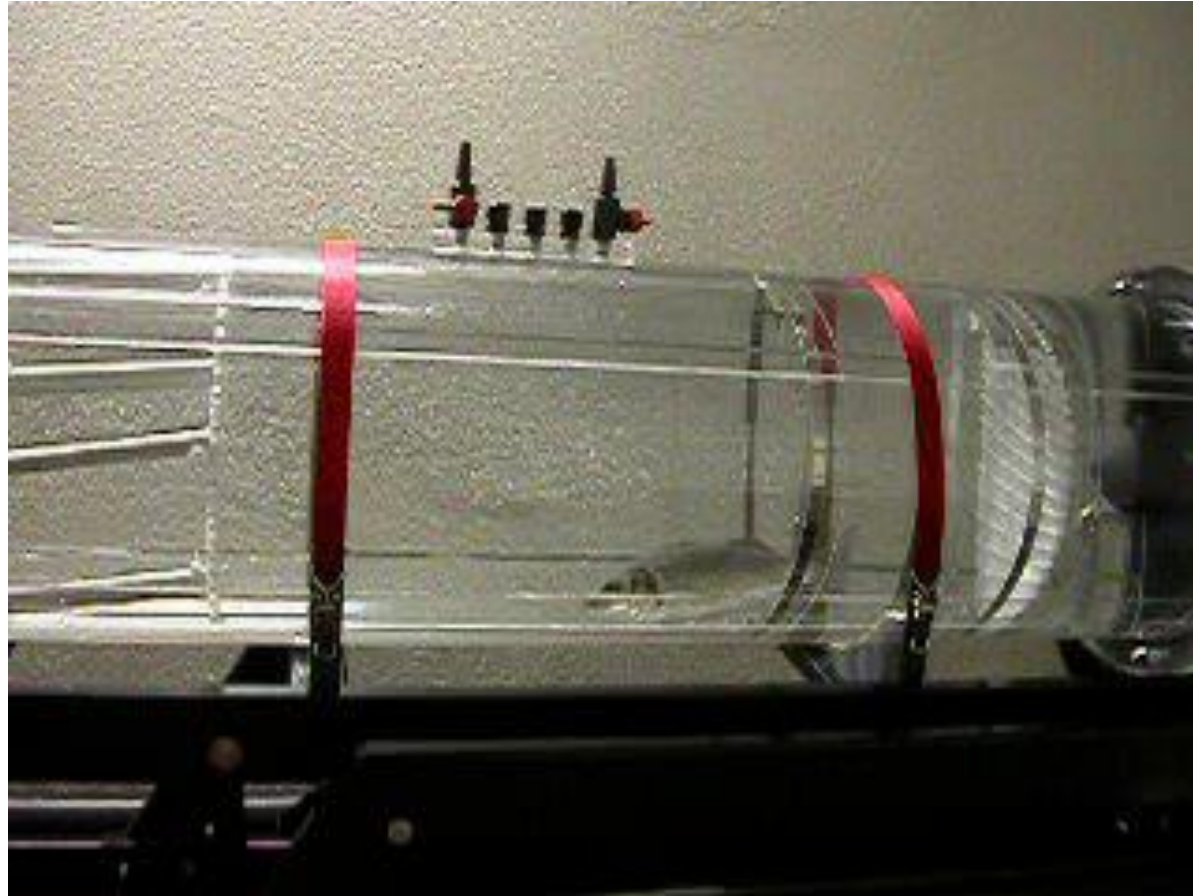
RESEARCH ON FISH WELFARE

One approach



A human "treadmill" to measure scope for activity

RESEARCH ON FISH WELFARE



RESEARCH ON FISH WELFARE

MONITORING THE “ENERGETIC COST”

Good welfare = healthy fish = ↑ ethics ↑ economy

**Improved feed conversion, less waste,
increased immune activity, optimal stocking
density**

**Increased muscle tone and retardation of
rigor, better flesh quality, superior product,
longer shelf life**