

Fish welfare: state of art 2026



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The Interregional Webinar on Aquatic Animal Welfare, Strengthening Awareness and Capacity for the Integration of Aquatic Animal Welfare into Aquaculture Practices and Official Controls

Webinar 13/07/2026

Animal welfare

- Different points of view.
- **Breeder**: good production = good welfare.
- **Veterinarian**: avoid unnecessary suffering, chronic stress and distress.
- **Animal rights activist**: any constriction or traumatic action is illegal.
- **Vegetarians and vegans**: **NO** to any kind of animal production and slaughtering.

Animal welfare

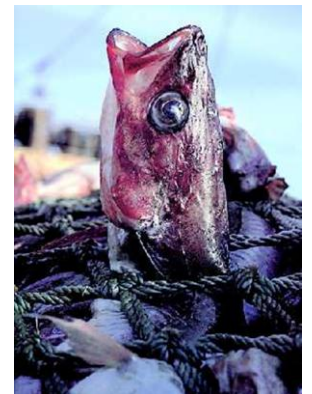
- New concept of animal welfare: global health, the set of positive psycho-physical conditions for the subsistence of sentient life ("**life worth living**").
- Consumers want healthy, safe foods that respect the animals' mental and physical needs.
- According to a sustainable aquaculture

Consumers point of view

- Consumers view the welfare of farmed fish with growing attention, torn between the desire for ethical safeguards and the need for assurances regarding food quality. Key concerns center on living conditions, water quality, and the impact on the ecosystem.

Perception of fish consumers

Characteristic	Perception of Farmed Fish	Perception of Wild-Caught Fish
Living Environment	Artificially controlled	Natural but subject to marine pollution
Food Safety	Lower heavy metal accumulation	Potential risk linked to marine contamination
Ethics and Sustainability	Concerns regarding stocking density and feed	Risk of overfishing and bycatch



Legislation in Europe

- Still very lacking, both at national than international level.
- A few sentencies about fish.
- Great Britain and Norway among the most advanced countries.
- E.U. going to implement, but with typical bureaucratic slowness.

Great Britain

- **Protection of Animals Act 1911** for wild animals (including farmed marine animals).
- **Agriculture Act 1968**: Prohibited causing unnecessary suffering and distress (freshwater aquaculture only).
- **Welfare of Animals Order 1997** (transport) and Regulations 1995 (slaughter and killing).

Fish farming

- Approved the **recommendation** of the **Council of Europe** in Strasbourg (general part on "farmed fish") in December 2005.
- It became effective after six months from the officialization by the Standing Committee.
- Obligation from the Member States to ratify it....**not all the members are applying this rule.**



Guidelines on Water Quality and Handling for the Welfare of Farmed Vertebrate Fish

EU Platform on Animal Welfare Own-Initiative Group on Fish

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World Organization for Animal Health

Aquatic Animal Health Code

Aquatic Animal Health Code

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SECTION 7.

WELFARE OF FARMED FISH

Chapter 7.1.	Introduction to recommendations for the welfare of farmed fish
Chapter 7.2.	Welfare of farmed fish during transport
Chapter 7.3.	Welfare aspects of stunning and killing of farmed fish for human consumption
Chapter 7.4.	Killing of farmed fish for disease control purposes

 Cattura rettangolare

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EU Regulation 1/2005 on animal transport

Article 1 Field of application

This Regulation applies to the transport of live **vertebrate** animals within the Community, including specific checks to be carried out by competent authorities on consignments entering or leaving EU countries

EU Regulation 1/2005 on animal transport

Article 3

General conditions for the transport of animals

No one is authorized to transport or have animals transported in conditions that expose them to unnecessary injury or suffering

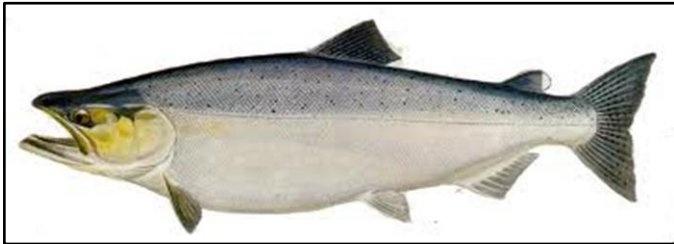
No specific rules available for fish



Fish welfare during transport

- Aquaculture is a very complex sector, with more than 300 species farmed all over the world (**at least 40 different species in EU**: finfish, mollusc and crustaceans).
- **Quite different “aquatic animals”** like embrionated eggs, post larvae (shrimp), fry and juvenile, broodstocks, live fish to slaughter-house, to put and take fisheries, for restocking purposes, *etc.*

Main farmed species in Europe



Atlantic salmon



Turbot



Rainbow trout



Sea bass



Carp



Sea bream

Minor species



Arctic char



Brown trout



Pike



Sturgeon

Different types of production



Fish welfare during transport

Different means of transport (trucks, well-boats, airplane)



Fish welfare during transport

Different materials:

- embrionated eggs
- broodstock or juveniles
- ornamental fish
- mollusc and crustaceans



Some critical point to be managed in aquaculture



Loading



Transport and unloading

Fish welfare during transport

- During long journey you need to change the water.
- **Few specific points in Europe....**so you need to ask to other fish farmers (health problems!!) or to the fire brigade or to the Coast guard in a port...marine species



EU Regulation 1099/2009

animals slaughtering

consideranda

The recommendations relating to farmed fish are not included in this Regulation due to the need for further scientific advice and an economic evaluation in the sector...

EU Regulation 1099/2009 animals slaughtering

As for fish, only art. 3 paragraph 1: "During killing and related operations, the animals are limited any avoidable pain, anxiety or suffering".



Farmed fish (finfish): EFSA opinion

Scientific Opinion of the Panel on Animal Health and Welfare General approach to fish welfare and to the concept of **sentience in fish – Gennaio 2009**

Animal welfare aspects of husbandry systems for farmed common **carp - Dicembre 2008**

Animal welfare aspects of husbandry systems for farmed European **seabass and gilthead seabream – Ottobre 2008**

Animal welfare aspects of husbandry systems for farmed fish - **European eel - Settembre 2008**

Animal welfare aspects of husbandry systems for **farmed trout - Settembre 2008**

Slaughtering: EFSA opinion 2008-09

- Species-specific welfare aspects of the main systems of stunning and killing of farmed **Sea bass and Sea bream**
- Species-specific welfare aspects of the main systems of stunning and killing of farmed **Rainbow Trout**
- Species-specific welfare aspects of the main systems of stunning and killing of farmed **Eels** (*Anguilla Anguilla*)
- Knowledge gaps and research needs for the welfare of farmed fish

International guidelines

OIE – World Organization for Animal Health - Aquatic Animal Health
Code 2026 - Chapter 7

FAO - Code of Conduct for Responsible Fishing which also includes the principles for the development of sustainable aquaculture.

FEAP – (Federation European Aquaculture Producers) - Code of Conduct for European Aquaculture

API – (Italian Fish farmers Association) Code of Good Breeding Practice in Aquaculture

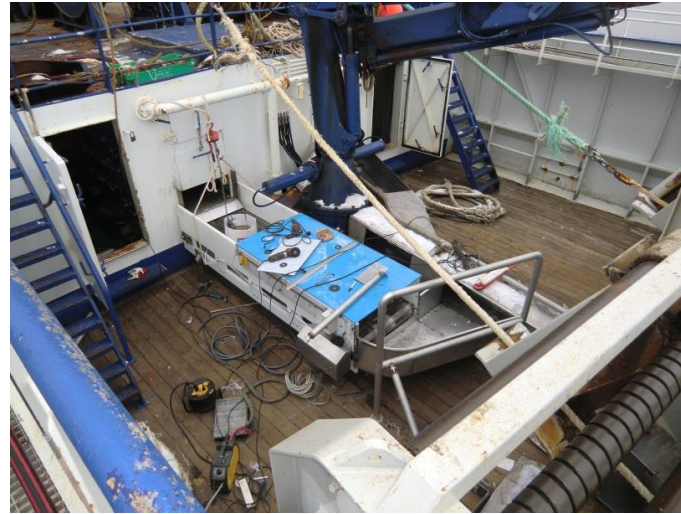
API - Guidelines for Product Certification in Aquaculture

Examples of stunning/killing methods for fish groups (Aquatic code 2026 art 7.3.8)

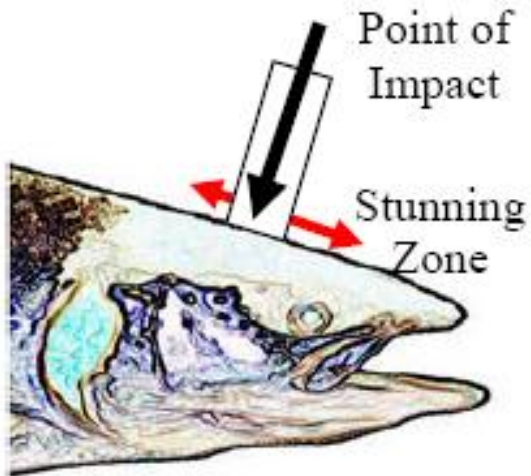
- The following methods enable humane killing for the following fish groups:
- **percussive stunning**: carp, salmonids;
- **spiking** or coring: tuna;
- **free bullet**: tuna;
- **electrical stunning**: carp, eel, salmonids.



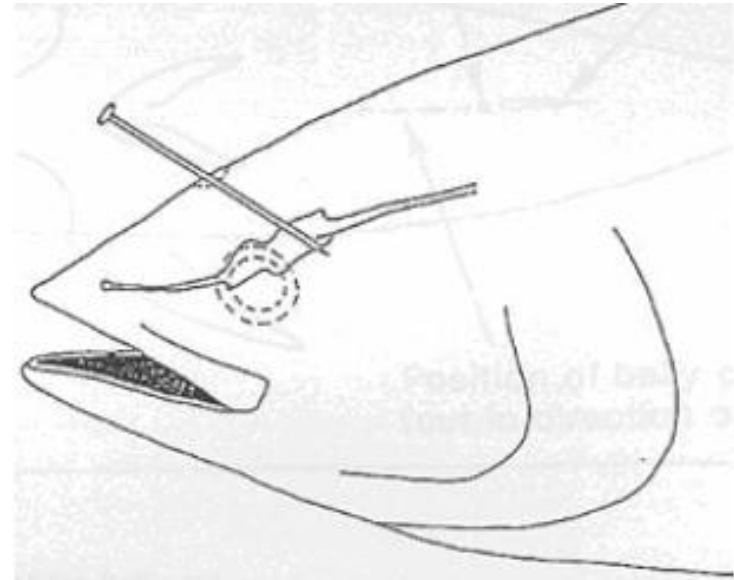
Percussive stunning



Electrical stunning



Spiking or coring



Poor fish welfare (WOAH code 2026)

The following methods are known to be used for killing fish:

chilling with ice in holding water, carbon dioxide (CO₂) in holding water; chilling with ice and CO₂ in holding water; salt or ammonia baths; asphyxiation by removal from water; exsanguination without stunning.

These methods **should not be used** if it is feasible to use the methods described in points 2 and 3 of this Article, as appropriate to the fish species.

Sea bass and bream

METHODS USED IN COMMERCIAL FARM

- Stunning in water with ice.
- Stunning in boxes with ice
- Asphyxiation



Stunning and killing...at the same time??



Allowed method...waiting for some better technique...



Electrical stunning (dry or wet) in marine species ... work in progress



Pictures by Leonidas Papaharisis (Greece)

EU COMMISSION: work in progress



EU COMMISSION: work in progress

Farm to Fork Strategy

Transition to sustainable food systems

Need to improve animal welfare

Review of animal welfare legislation/Animal welfare labelling

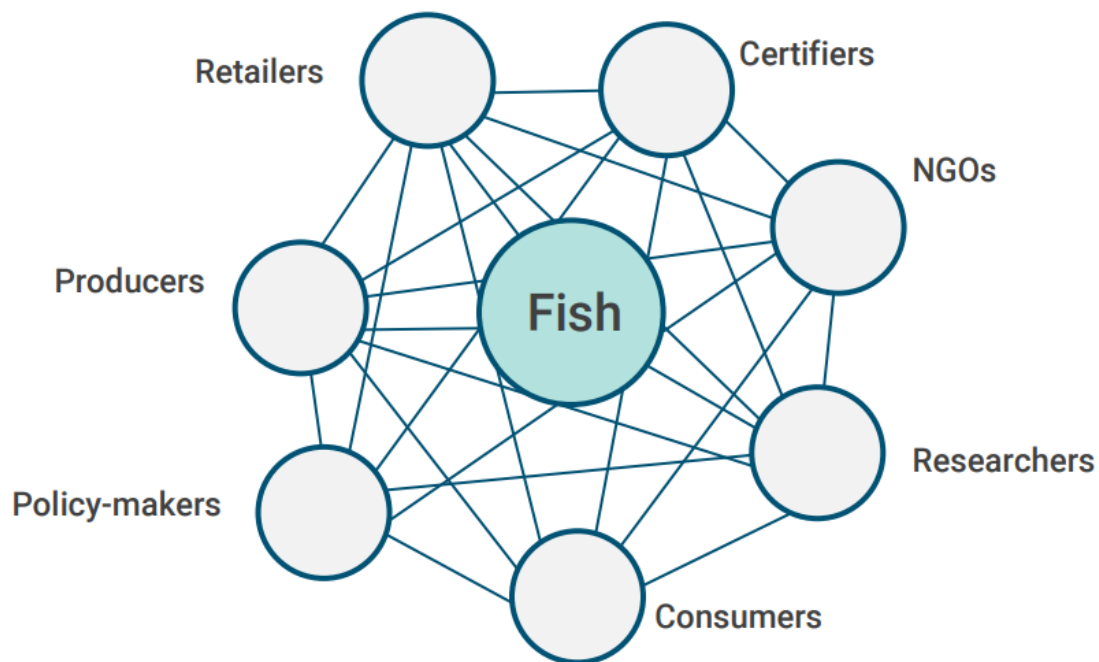
Significant increase in organic aquaculture

Action Plan on Organic Farming



RESEARCH: work in progress

Science-based collaborative approach:



Good news.....January 2024

Animal Welfare: New EU Reference Centre for the welfare of aquatic animals

Today, **the Commission has adopted a Decision designating the fourth European Union Reference Centre for Animal Welfare, which will specialise in the welfare of aquatic animals.**

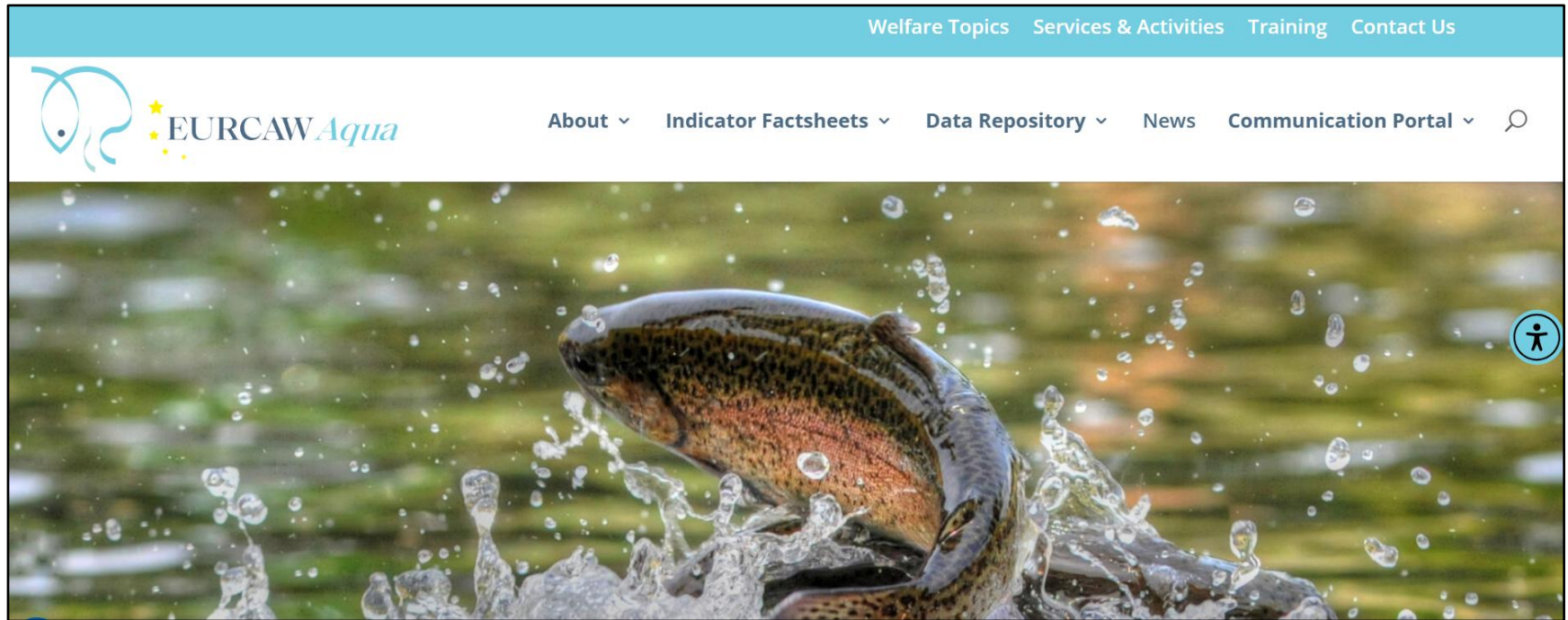
The Reference Centre for the welfare of aquatic animals has been designated following a public selection process. It will be run by a **Consortium led by the University of Crete (Greece)**, and also composed of the **Biology Centre of the Czech Academy of Sciences, Institute of Parasitology (Czechia) and the Universitat Autònoma de Barcelona (Spain).**

EU Reference Centres for animal welfare are established to assist EU countries in their official controls on animal welfare **rules in farms, during transport and at the time of slaughter or killing.**

Improving the welfare of aquatic animals, particularly in farms, during transport and at the time of killing, is an important part of the Commission's animal welfare agenda. The new EU Reference Centre will contribute to ensuring that EU rules in this area are respected. It will support the activities of the Commission and Member States by carrying out scientific and technical studies, as well as conducting training courses and disseminating research findings and information on technical innovations.

Reference Centres are foreseen under the Official Controls Regulation, adopted in March 2017, which harmonises EU rules on official controls along the whole agri-food chain, including in relation to animal welfare rules.

New reference laboratory – EURCAW-Aqua



EURCAW Aqua team and Ethics Committee



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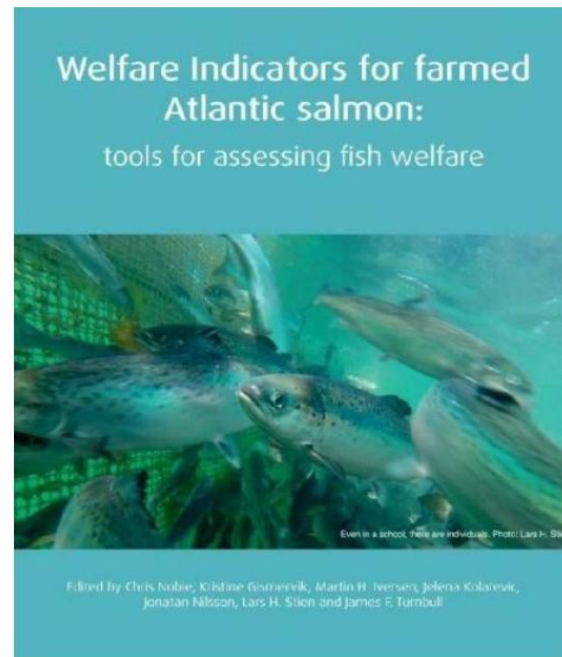
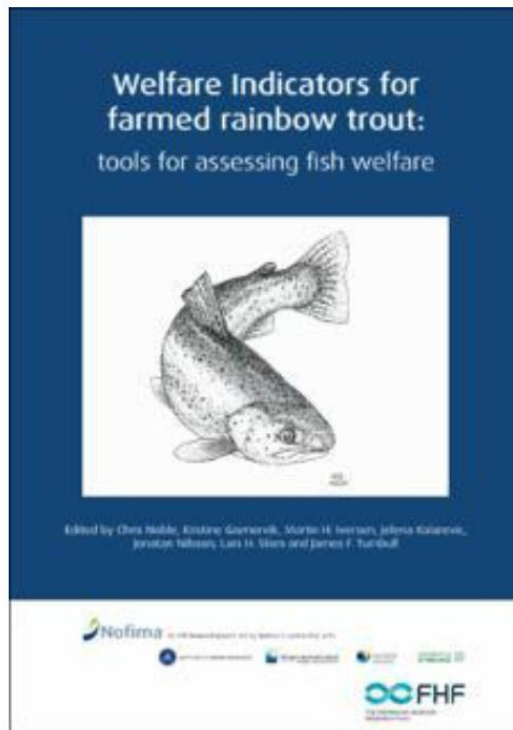


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Welfare Indicators – The need for species-specificity





No legislation? But we need to do more

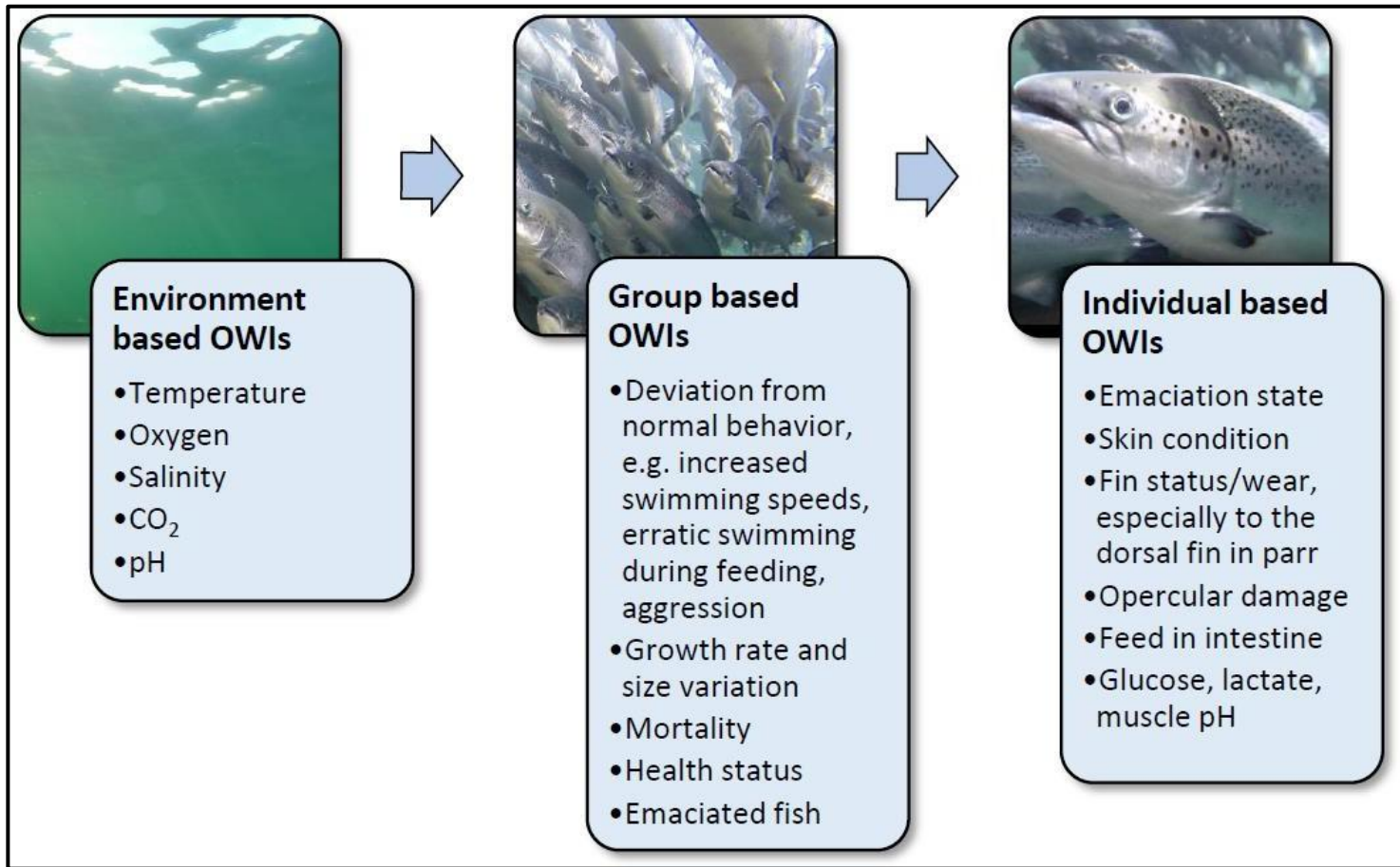
Welfare Indicators can be a good approach

Environment based – observations made on the environment, infrastructure and processes (also known as Indirect WIs or Resource-based WIs).

Animal based (group and individual)– observations made on or from the animal (also known as Direct WIs or Outcome WIs), both group based than individually based

At the moment no indicators are available for sea bass and bream (some works and projects are in progress)

Welfare indicators (Noble *et al*, 2020)



WELFARE INDICATORS (AdriAquaNet InterReg project)

Environment based



Animal based (group and individual)

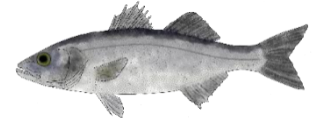


OPERATIONAL WELFARE INDICATORS (OWIs) IN SEA CAGES

Environment based OWI	Group based OWIs	Individual based OWIs
Oxygen	Emaciated fish	Emaciation state
Temperature	Appetite	Fin damage
Salinity	Growth	Skin loss/ulcers
Turbidity	Mortality	Eye status
Other.....	Abnormal swimming	Deformities
	Abnormal behavior	Abnormal pigmentation
	Diseased fish	Opercular damage
	Other.....	Mouth/Jaw damage
		Gill status
		Ectoparasites
		Feed in intestine
		Visceral fat

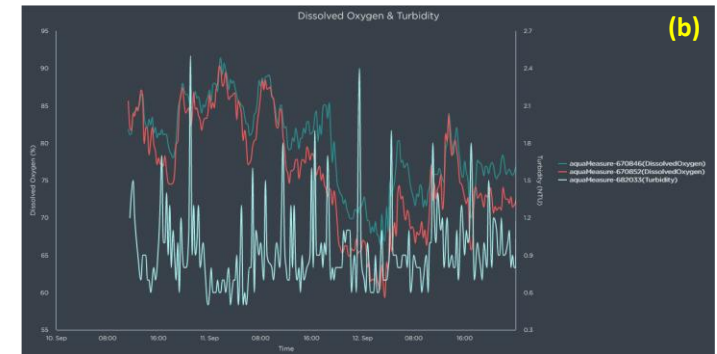
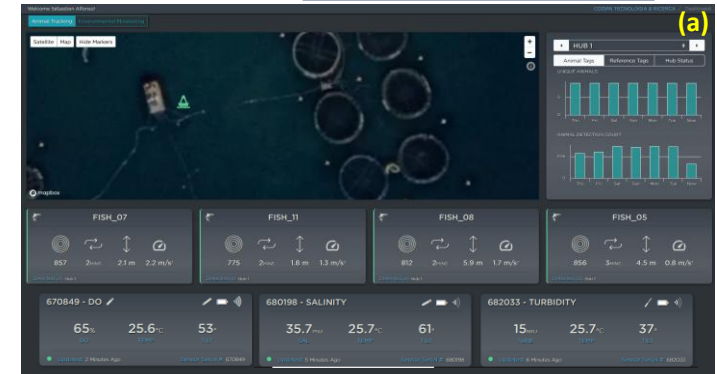
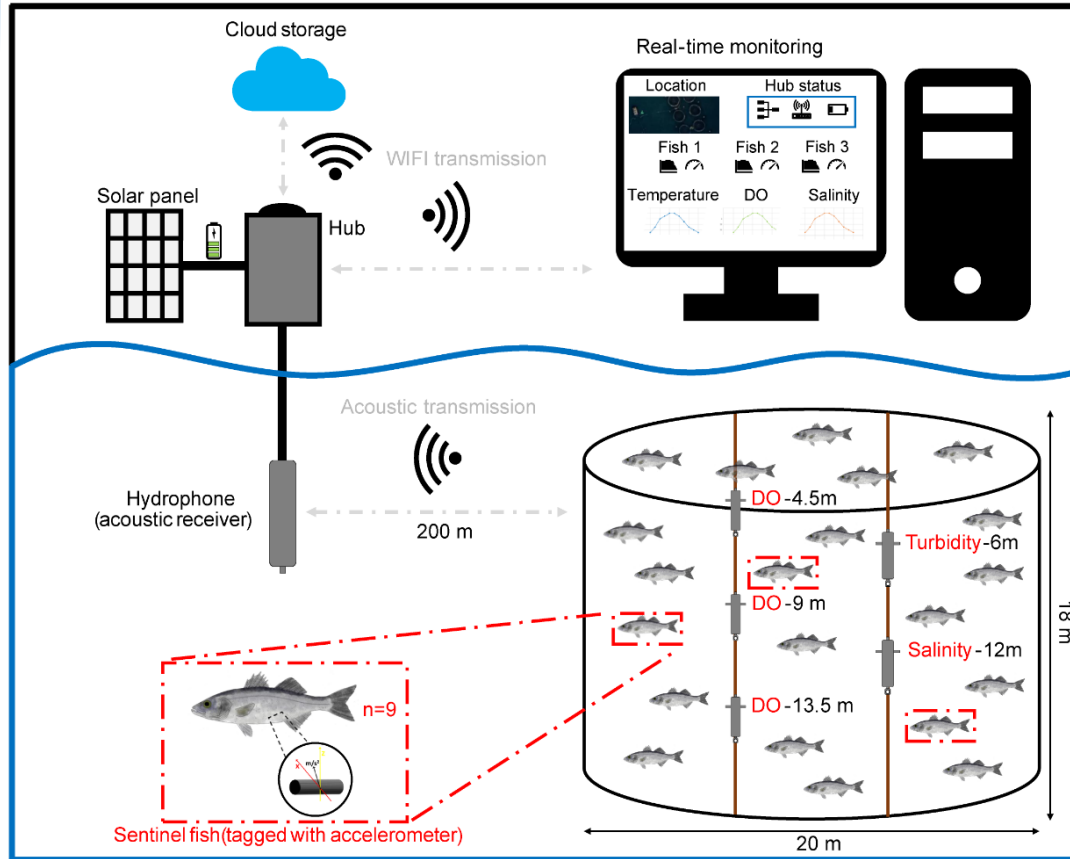


Use of sensors in aquaculture environments

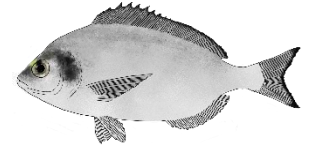


- **Case study 4a:** Combination of physiological and environmental sensors – Sea bass

Monitoring – 68 days

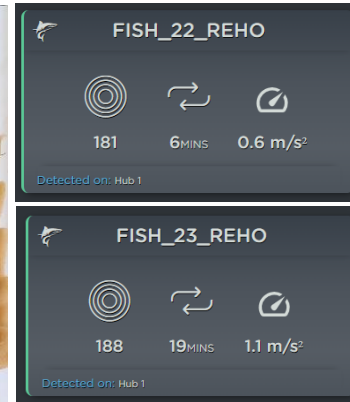


Use of sensors in aquaculture environments



• Case study 4b: Combination of physiological and environmental sensors – Sea bream

Ongoing experiment – September 2023 → August 2024



Real time data:

- Fish behavior (depth)
- Fish activity– proxy of energy expenditure
- Environmental parameters

Results coming soon!

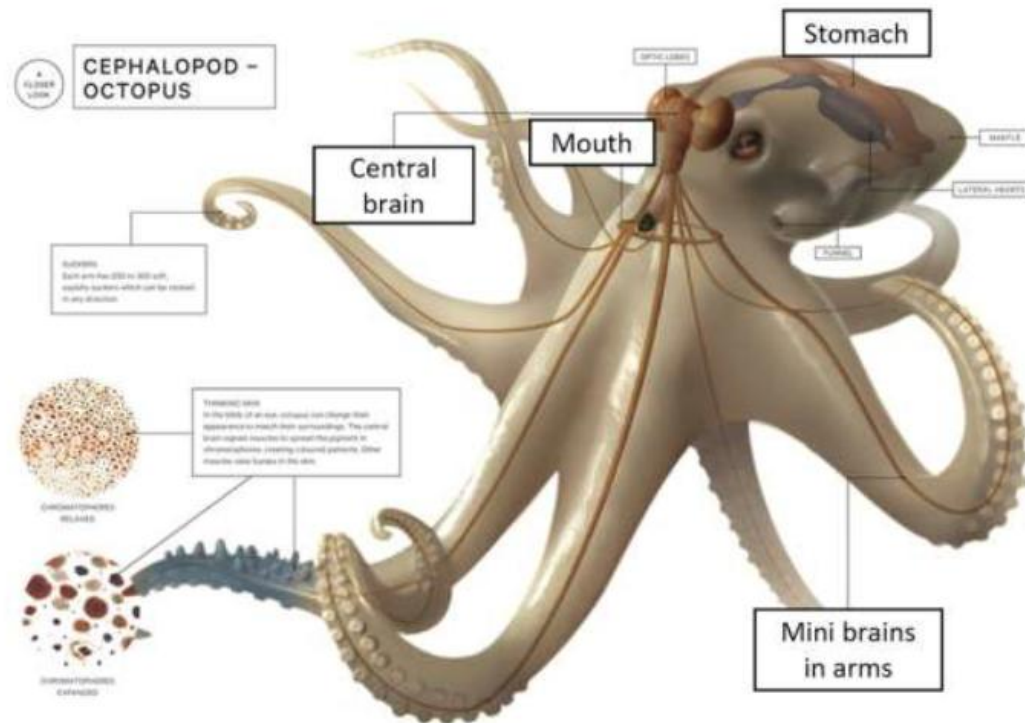


New challenges 2025-2030 (crustaceans)

- The **Italian Ministry of Health** has established a **working group on crustacean welfare**.
- The members belong to:
- Welfare office Ministry of Health – Rome;
- **National Reference lab on animal welfare – IZSLER Brescia**
- **NRL fish, mollusc and crustacean diseases - IZSVe**
- University of Nape;
- Local Competent authorities;
- Private company (to be identified)



Octopus spp.....the only invertebrate included in EU legislation about experimental trials



● Thanks.....



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