



# Making Fish Welfare Indicators and Behavioural Assessment Applicable to Industry

Code of good practices on fish welfare  
and fish welfare indicators

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# FISH WELFARE INDICATORS

- ❖ **Introduction and overview**
- ❖ **Type of indicators**
- ❖ **Selection of general fish welfare indicators**
- ❖ **Factsheets of general fish welfare indicators**

# FISH WELFARE INDICATORS

❖ **Introduction and overview**

LITERATURE REVIEW

# FISH WELFARE INDICATORS

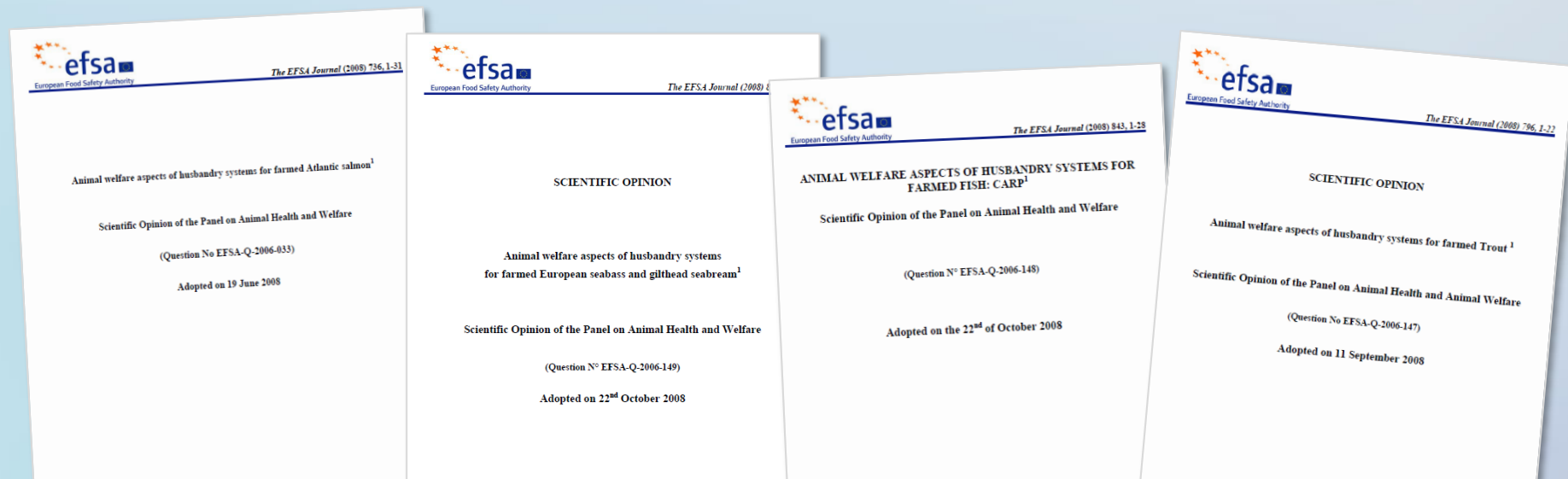
## ❖ Introduction and overview

## LITERATURE REVIEW

European Food Safety Authority (EFSA)

Reports: Animal welfare aspects of husbandry systems for farmed fish → welfare risk assessment

Atlantic salmon, Seabream, Seabass, Common Carp, Rainbow trout, Brown trout



# FISH WELFARE INDICATORS

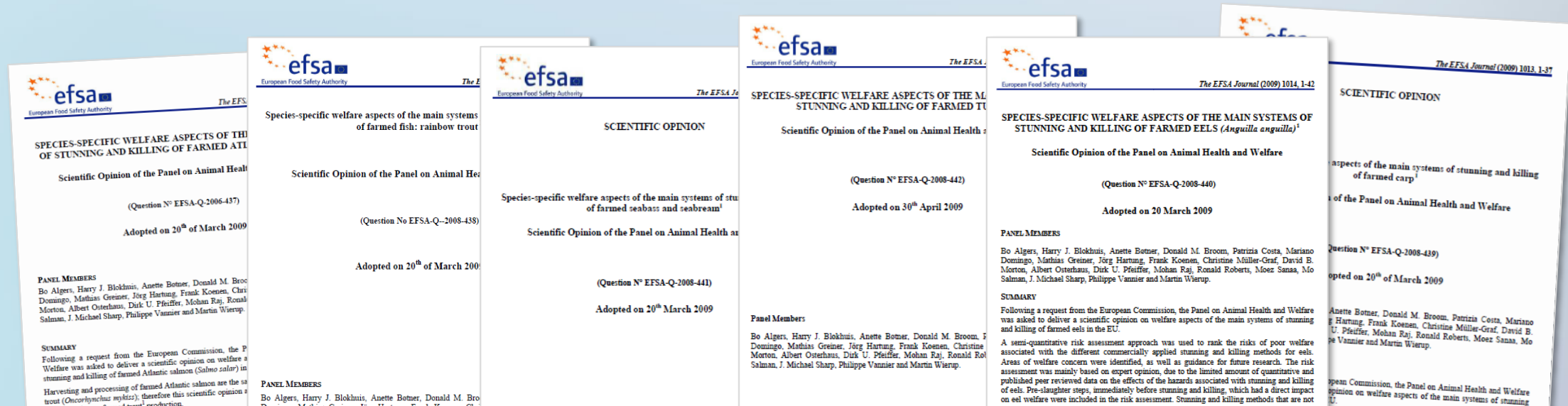
## ❖ Introduction and overview

European Food Safety Authority (EFSA)

Stunning and killing → semi-quantitative welfare risk assessment

Atlantic salmon, Rainbow trout, Seabream, Seabass, Common carp, Eel, Turbot

## LITERATURE REVIEW





# FISH WELFARE INDICATORS

## ❖ Introduction and overview

Scientific publications

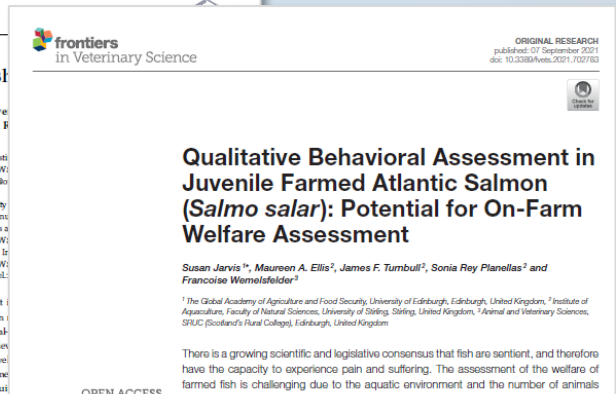
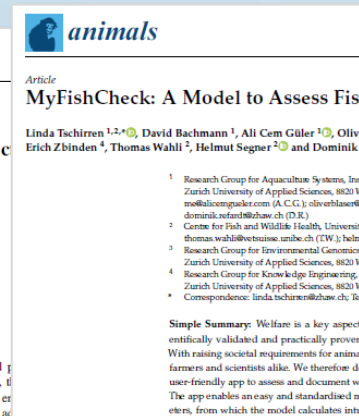
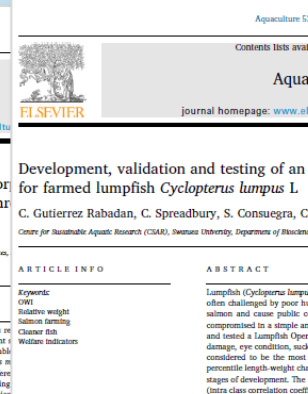
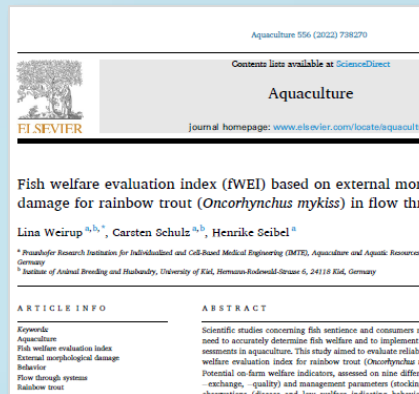
fish Welfare Evaluation Index (fWEI)

Operational Welfare Score Index

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MyFishCheck

Qualitative Behavioural Analysis (QBA)



# FISH WELFARE INDICATORS

## ❖ Introduction and overview

Handbooks, Manuals

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# FISH WELFARE INDICATORS

## ❖ Introduction and overview


European projects

MedAID project

PerfomFISH project (BBW-tool)

Cure4Aqua project

LITERATURE REVIEW




**medAID**  
Mediterranean Aquaculture Integrated Development

**Deliverable No. 4.5**

Report on fish welfare and list of operational welfare indicators in sea bream

Author/s: Ana Roque (IRTA), M Filipa Castanheira (CCMAR), Anna Toffan (IZVE), Pablo Arechavala-Lopez (CCMAR), Edgar Brun (NVI), Morris Vilarroel (UPM), Enric Gisbert (IRTA), Constantinos Mylonas (HCMR), Ana Muniesa (IAMZ-CIHEAM), Alicia Estevez (IRTA), Antoni Dalmau (IRTA), Bernardo Basurco (IAMZ-CIHEAM)

Approved by Leader of Work Package 4: Edgar Brun, Norwegian Veterinary Institute



**PerformFISH**

Acronym: PerformFISH

*Title: Consumer-driven production: Integrating Innovative Approaches for Competitive and Sustainable Performance across the Mediterranean Aquaculture Value Chain*

Grant Agreement: 727610

**Deliverable 3.6**

**Methodology for assessing welfare in MMFF**

Lead parties for Deliverable: ISPra  
Due date of deliverable: M36  
Actual submission date: M55  
Version: V2

Dissemination level: PU

**WELFARE ASSESSMENT**  
*study for*  
**EUROPEAN SEA BASS**



ΕΛΛΗΝΙΚΗ ΔΗΜΟΚΡΑΤΙΑ

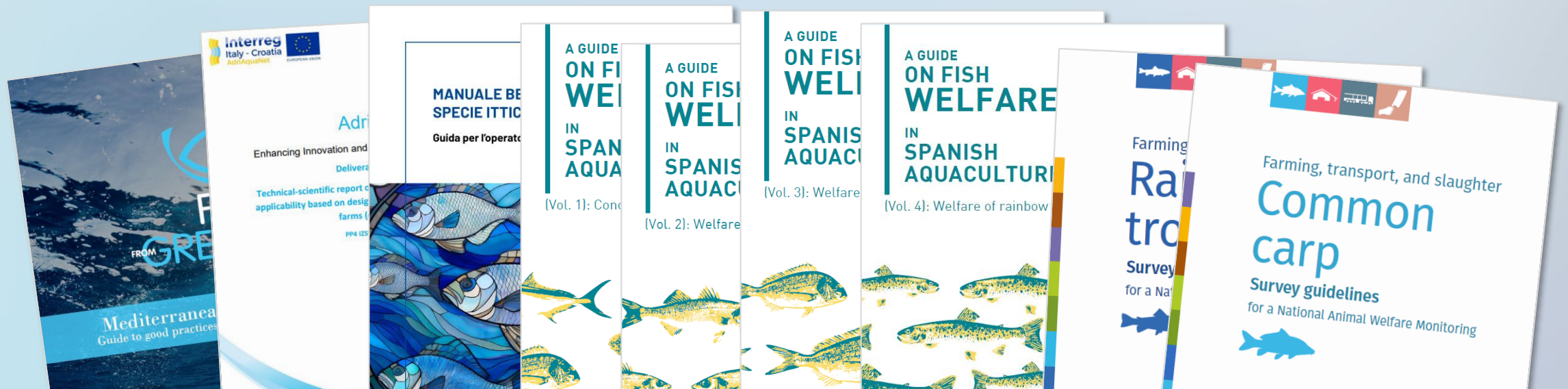
# FISH WELFARE INDICATORS

## ❖ Introduction and overview

National funded initiatives

Greece, Croatia, Italy, Spain, France, Germany

LITERATURE REVIEW



# FISH WELFARE INDICATORS

## ❖ Introduction and overview

NGOs reports and database

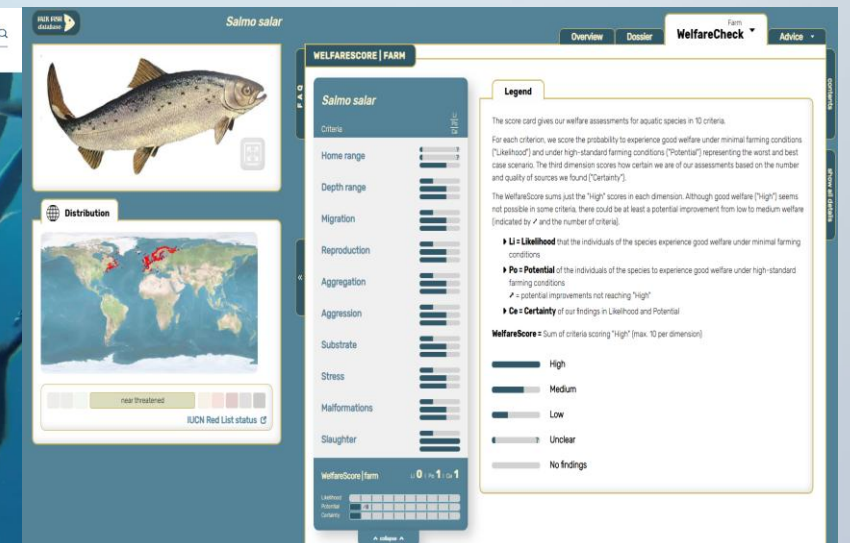
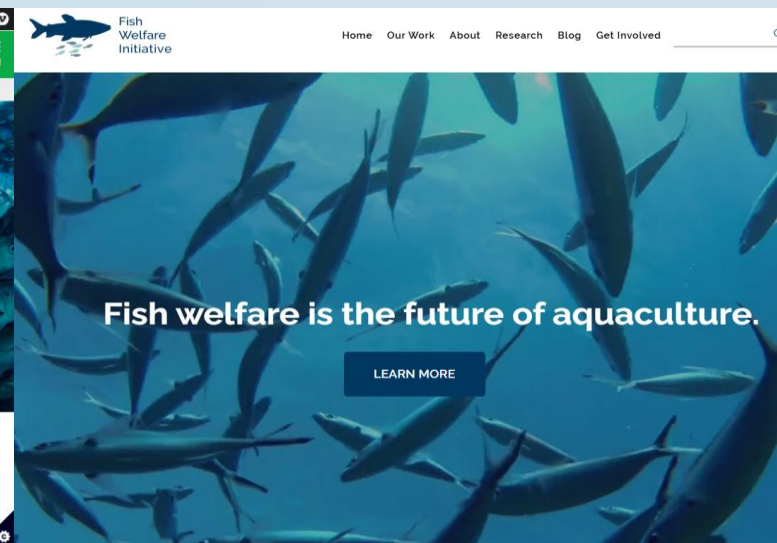
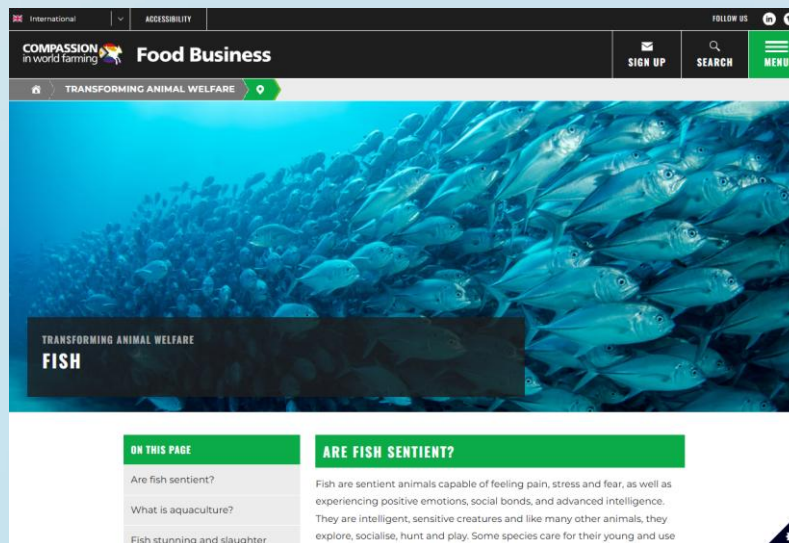
Compassion in World Farming (CiWF)

Fish Welfare Initiative (FWI)

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Fair-fish database (WelfareCheck profiles)

FAI farms



# FISH WELFARE INDICATORS

## ❖ Introduction and overview

Certifications

RSPCA, Global GAP, ASC, Organic aquaculture

LITERATURE REVIEW



# FISH WELFARE INDICATORS

## ❖ Introduction and overview

- Need for standardized monitoring measures, assessment protocols and tools to provide a scientifically sound basis for an assessment of the welfare status of fish.
- Based on technology and fish welfare indicators:
  - general operational indicators: rapid and objective assessment in any scenario.
  - specific indicators: the needs of the species and life stage, production system.
- Training and education: provide general and species-specific OWIs, assessment protocols, and codes of good practices.

# FISH WELFARE INDICATORS

## ❖ Type of indicators

- Welfare indicators should include different aspects related to the behavioural, physiological and psychological characteristics of the captive animals, covering the three welfare approaches:
  - Feeling-based approach
  - Function-based approach
  - Nature-based approach

### Categories

- General indicators
- Specific indicators

# FISH WELFARE INDICATORS

## ❖ Type of indicators

VALID

RELIABLE

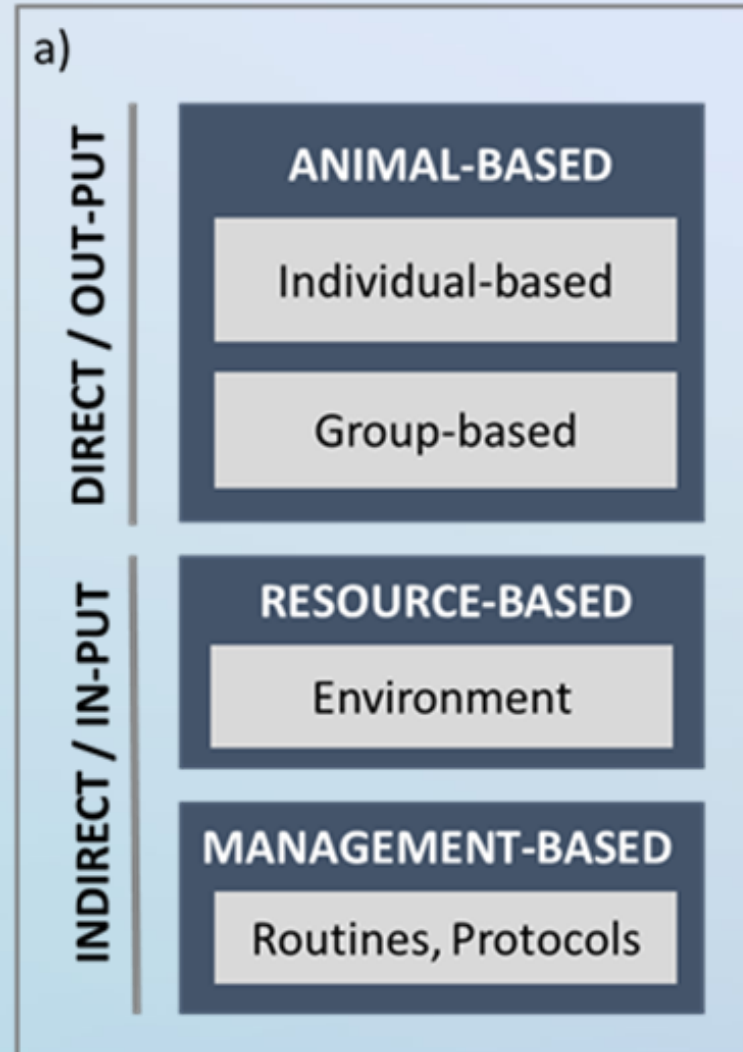
REPEATABLE

COST-EFFECTIVE

SUITABLE

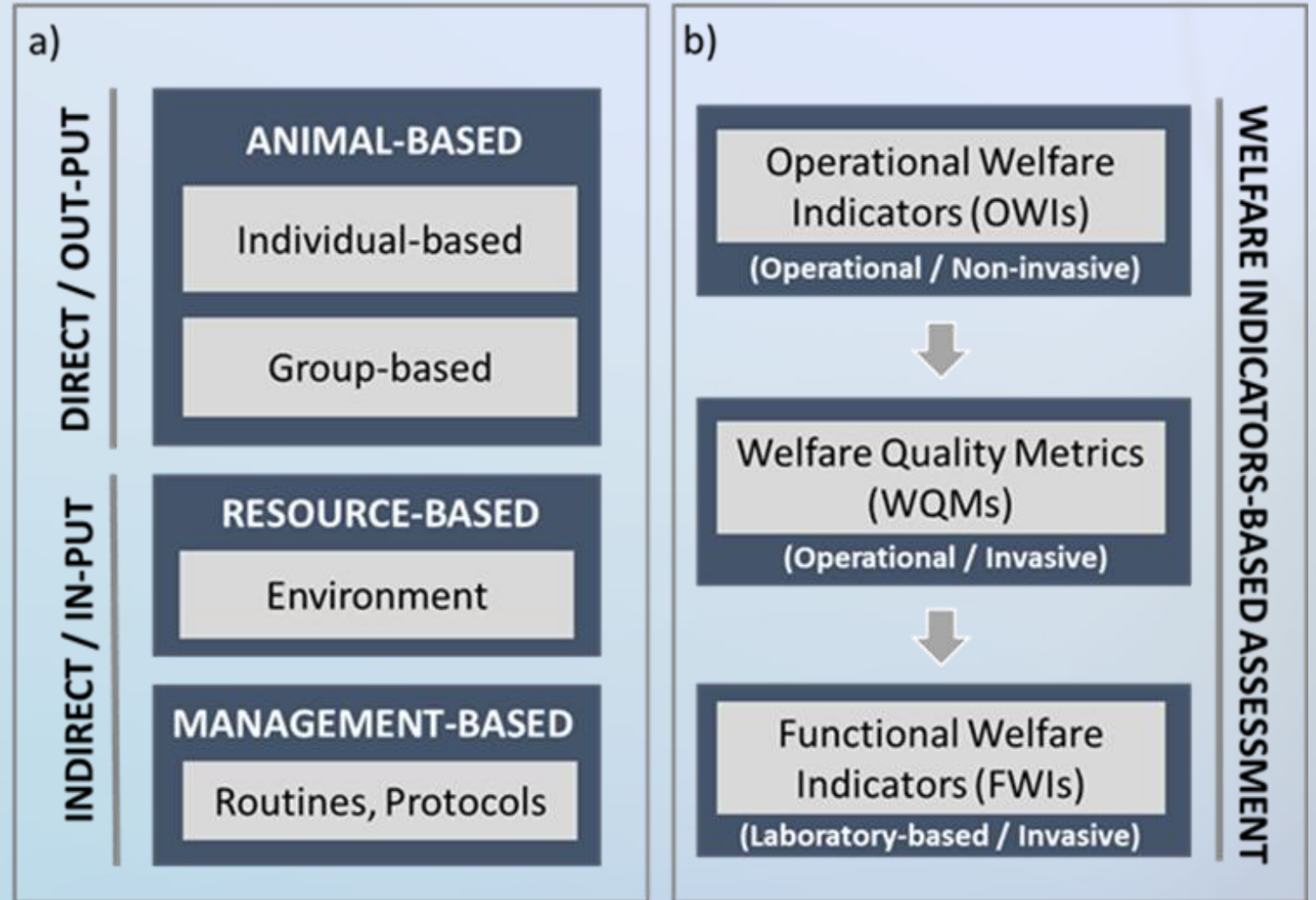
# FISH WELFARE INDICATORS

## ❖ Type of indicators



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## ❖ Type of indicators



# FISH WELFARE INDICATORS

## ❖ Selection of general fish welfare indicators

- A series of OWIs that allow for **objective, rapid, effective** and **minimum invasive** assessment of fish welfare in any production system, species and life-stage, can be identified.
- For the purpose of this document – that aims to be practical and user-friendly - **the most practical on-farm OWIs have been selected for the different procedures or topics**
- Species-specific indicators are out of the scope of the current document.
- Reduced list - to promote its effectiveness, focused primarily on animal behaviour, as well as other relevant and general parameters.
- Management-based indicators were not selected but were included as good practices on fish welfare in Chapter 4.



















# FISH WELFARE INDICATORS

## ❖ Factsheets on general fish welfare indicators

### 5.4.1. Feeding

General fish welfare indicators for feeding			
Indicator	Metrics	Operational recommendations	Comments and rationale
Food anticipatory behaviour	Presence / Absence	In case of the presence of food anticipatory behaviour, farmers must keep routinary procedures, but check if the feeding strategy (distribution, quantity, periodicity, etc.) is adequate. In case of the absence of food anticipatory behaviour, farmers must check the feeding strategy and adjust it if necessary. In both cases, other indicators must be checked (e.g. feeding response or emaciation).	Fish are agitated before feeding, showing movements or actions that precede the delivery of feed, indicating that the animals are aware of routine procedures taking place imminently. Observing food anticipatory behaviour indicate an emotional qualitative component of wanting and liking the food sources. However, it can also increase when fish are deprived of food, indicating emotional states of hunger and an urge to eat.



# Thank you!

