

EUROGROUP
FOR ANIMALS

**Fish Welfare in
Aquaculture** : the
practical approach to
husbandry, health and
consumers

Online event: 22 March 2022



AGENDA

Moderated by Douglas Waley (Eurogroup for Animals)

1. Policy initiatives - 14:10

- Fish welfare in the new Strategic Aquaculture Guidelines
 Lorella de la Cruz (DG-MARE)
- EU Platform on Animal Welfare fish welfare guidelines
 Katerina Marinou (Greece)

1. Interactive fish welfare training - 14:30

- Joao Saraiva (Fish EthoGroup)

1. Panel discussion - 15:15

- Joao Saraiva (FishEthoGroup)
- Hans van de Vis (Wageningen University)
- Javier Ojeda (FEAP)

1. Policy initiatives (continued) - 15:45

- Fish welfare in the Animal Welfare legislative Review
 Kornilia Zafeiropoulou (DG-SANTE)

The Animal Welfare Platform – Fish welfare own initiative group conclusions

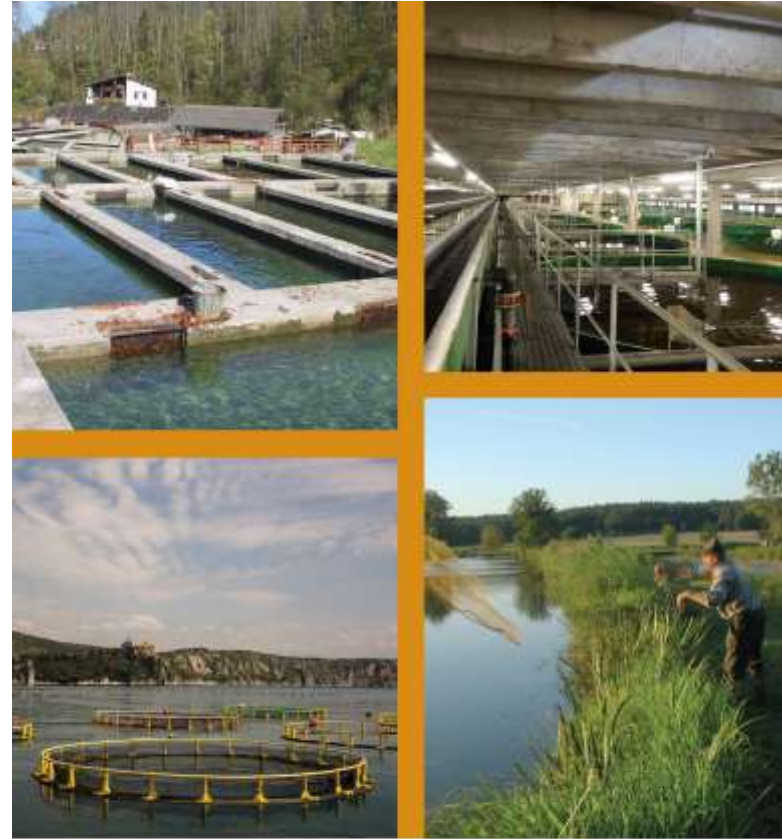
Katerina Marinou
DVM, MVM, PhD
Head of the Animal Welfare for Farm and Laboratory Animals Department
Ministry of Rural Development and Food



The EU Animal Welfare Platform:
promoting dialogue on animal welfare issues relevant at EU level.



#EU4AnimalWelfare



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

EU Platform on Animal Welfare Own Initiative Group on Fish

DOC_11068_2020 Rev.1

EUROGROUP FOR ANIMALS Fish Welfare in Aquaculture
22 March 2022

Why is this Own Initiative important?

- **Fish are sentient beings and can feel pain** (OIE, 2008, EFSA, 2009).
- **Fish are particularly sensitive to their environment and handling.**
- **EU regulations require that we pay full regard to their welfare.**
- **2017 European Commission Report on Fish Transport and Slaughter Common Practices called for further dialogue on fish welfare in the EU Animal Welfare Platform.**
- **The guidelines created by this initiative will allow farmers, competent authorities and the public to implement current knowledge.**

The EU Animal Welfare Platform:
promoting dialogue on animal
welfare issues relevant at EU level.

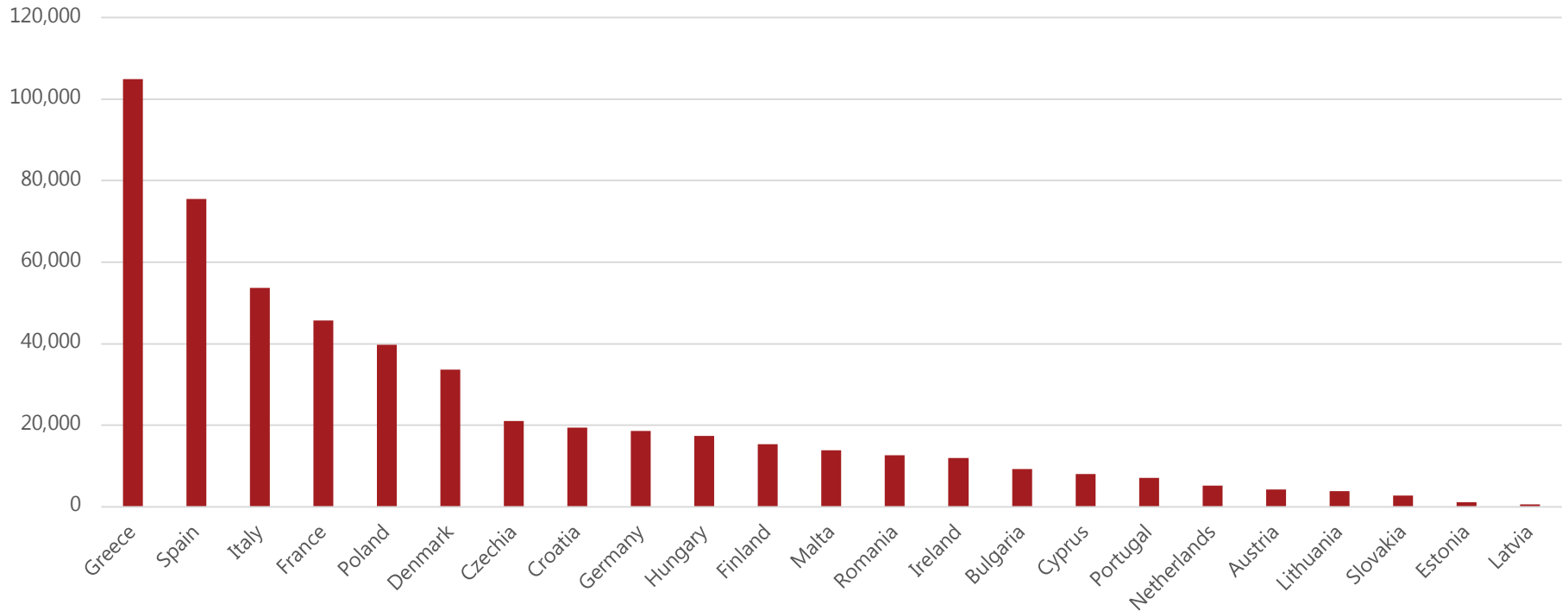


Fish Welfare in Aquaculture
22 March 2022



Why this Own Initiative?

EU finfish aquaculture production 2019 – 525,036 tonnes



Source of data: Eurostat

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welfare issues relevant at EU level.



Fish Welfare in Aquaculture

22 March 2022



Members

PAW Member	Initiative Delegate
Greece	Katerina Marinou
Denmark	Birte Broberg
Germany	Stephan Reiser
Italy	Amedeo Manfrin
Spain	Pilar Leon/ Maria Teresa Villalba
Norway	Bente Bergersen, Kristine Marie Hestetun
Eurogroup for Animals	Douglas Waley
Compassion in World Farming	Natasha Boyland/ Krzysztof Wojtas
RSPCA	Malcolm Johnstone
Animals Angels	Helena Bauer
International Society for Applied Ethology (ISAE)	Dr Moira Harris
FVE	Kari Norheim/Alain Schonbrodt
FEAP	Bernhard Feneis
FEAP	Andrea Fabris, Niels Henriksen
EFFAB	Ana Granados Chapatte
Linda Keeling	Albin Gräns
Evangelia N. Sossidou	Evangelia Sossidou
OIE (observer status)	Djahne Montabord
DG MARE (observer status)	Birgit Van Tongelen
Secretariat:	
Eurogroup for Animals	Alessia Virone/ Sophie Aylmer

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Fish Welfare in Aquaculture

22 March 2022



General Guidelines Outline

Section No 1: Water Quality

Section I. Provisions from the Council of Europe Recommendation concerning farmed fish

Section II. Guides to good animal welfare practice

Each section covers:

A: General principles

B: Guidelines for the operator

C: Guidelines on specific water quality parameters and operating procedures



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Fish Welfare in Aquaculture
22 March 2022



Section No 1: Water Quality

A: General principles

- Poor water quality elicits a stress response in fish. Chronic stress in the long term can impair immune function, growth and reproductive function.
- The threats to fish welfare from physiological or pathological disturbances caused by water quality relate not only to its parameters' absolute levels but also to their rate of change. They also relate to the size of the fish, their developmental stage, previous experience, health status, and different coping strategies and capacities.



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Section No 1: Water Quality

B: Guidelines for the Operator

- All parties responsible for the keeping of fish should ensure that consideration is given to the potential impact of water quality on the welfare of the fish.
- Knowledge may be a result of formal training and practical experience.
- The water source and supply should be analyzed and ensured for aquaculture sites.



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welfare issues relevant at EU level.



Fish Welfare in Aquaculture

22 March 2022



Section No 1: Water Quality

C: Guidelines on specific water quality parameters and operating procedures

- Water quality should be monitored regularly and preferably with an automated system.
- The most important parameter for monitoring are: *Oxygen, ammonia, carbon dioxide, pH and temperature*
- The guidelines also address the keeping of eggs and young fish, handling of dead and moribund fish, transport containers, supersaturation, toxic metals, sulphur and suspended solids.



Photograph: Courtesy of Bernhard Feneis

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welfare issues relevant at EU level.



Fish Welfare in Aquaculture

22 March 2022



General Guidelines Outline

Section No 2: Fish Handling

Section I. Provisions from the Council of Europe Recommendation concerning farmed fish

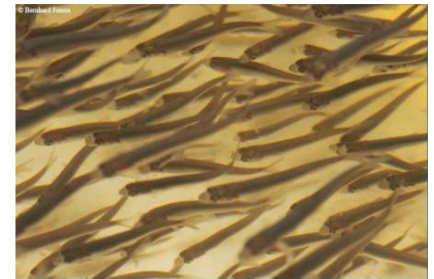
Section II. Guides to good animal welfare practice

Each section covers:

A: General principles

B: Guidelines for the operator

C: Guidelines on specific practices



The EU Animal Welfare Platform:
promoting dialogue on animal
welfare issues relevant at EU level.



Fish Welfare in Aquaculture
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Section No 2: Fish Handling

A: General principles

- Handling causes stress and a brief period of stress may bring long lasting effects.
- Inappropriate handling procedures can lead to injury, pain, distress, and suffering.
- As a result, increased disease incidence, increased mortality, reduced appetite, impaired development, and deformities in fish may ensue.



Photograph: Courtesy
of Bernhard Feneis

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welfare issues relevant at EU level.



Fish Welfare in Aquaculture
22 March 2022



Section No 2: Fish Handling

B: Guidelines for the Operator

- All parties responsible for the keeping of fish should ensure that consideration is given to the potential impact of handling on the welfare of the fish.
- Knowledge may be a result of formal training and practical experience.
- Handling procedures should be gentle and kept to an absolute minimum.
- The operator should have relevant procedures that identify critical points in the handling procedure, propose corrective measures and indicate when to discontinue handling in order to maintain adequate fish welfare.

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welfare issues relevant at EU level.



Fish Welfare in Aquaculture
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Section No 2: Fish Handling

C: Guidelines on Specific Practices

- Preparatory activities include inspecting the condition of the fish, acclimatization and feed withdrawal.
- Crowding should avoid invoking a maximal stress response. The impact of crowding should be reduced primarily by carrying it out in several steps.
- Size grading prevents the development of aggressive behaviors and cannibalism and offers better access to feed. Instances of grading should be carefully planned and kept to a minimum.
- Equipment including pumps and nets should be designed to avoid physical injury and be maintained in good condition.

Fish should not be allowed to asphyxiate under any circumstances.

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The Next Steps

- **DG-SANTE has translated into most EU languages**
- **Spain is producing Spanish translation**
- **Members of the platform subgroup and plenary are checking translations**
- **To be published soon**



Photographs: Courtesy of Bernhard Feneis

Fish Welfare in Aquaculture
22 March 2022

Conclusions

- **The knowledge is available now, the animal welfare legislative opportunity is open now, and the mechanisms to support aquaculture operators and competent authorities are being put in place.**
- **The timing is right to make provisions for fish welfare.**



Fish Welfare in Aquaculture
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Acknowledgements

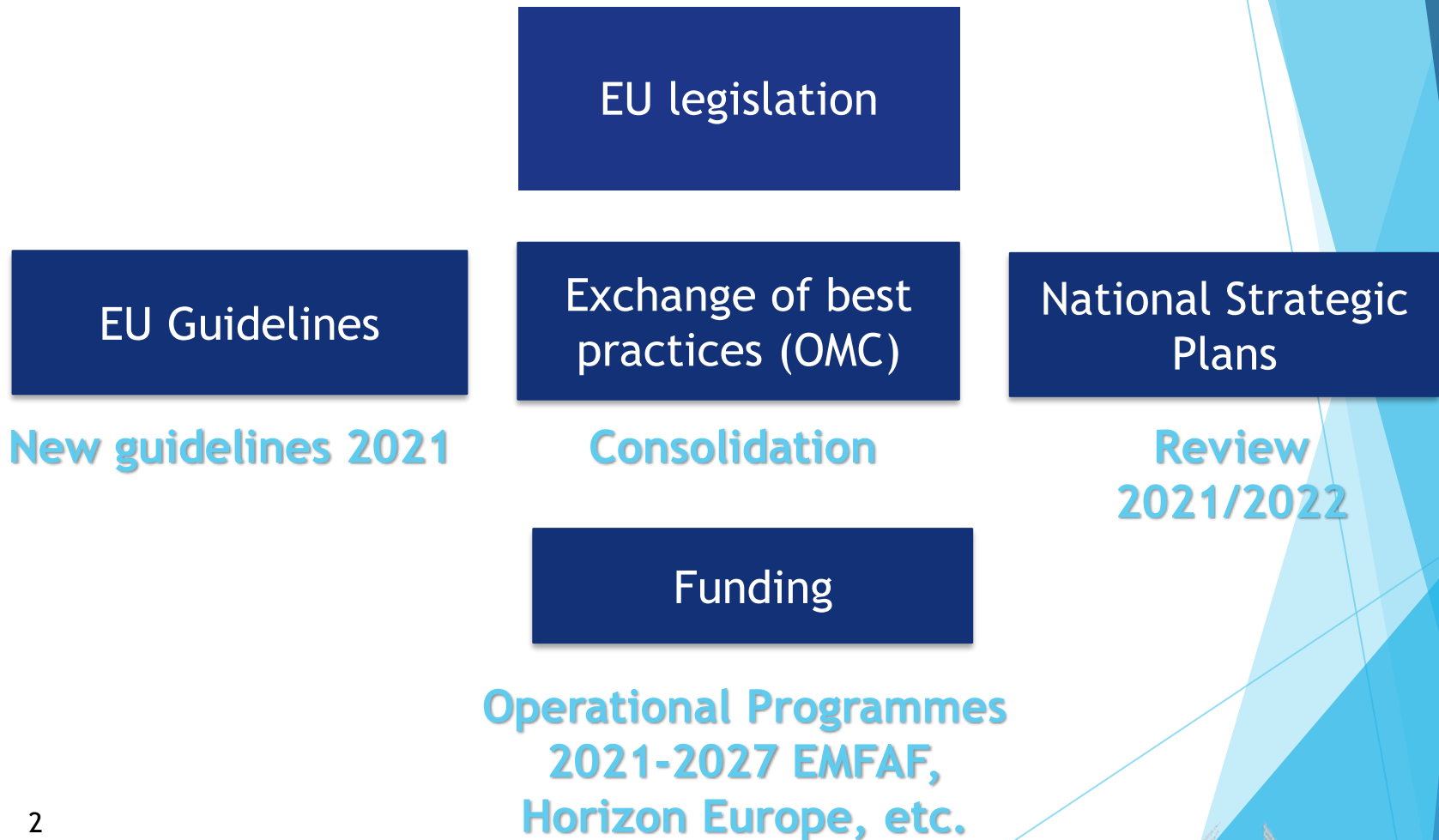
BLUE FARMING

FISH WELFARE IN THE NEW STRATEGIC GUIDELINES FOR EU AQUACULTURE

Lorella de la Cruz Iglesias
European Commission,
DG MARE A2



EU aquaculture policy



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



Specific horizontal objectives

Building resilience and
competitiveness

Participating in the
green transition

Ensuring social acceptance and
information to the consumer

Increasing knowledge
and Innovation

Animal welfare in strategic guidelines on EU aquaculture

Areas of focus

Further action focused on:

- ▶ **good practices** on fish welfare during farming, transport and killing;
- ▶ Common **fish-welfare indicators** throughout the production chain;
- ▶ **Research and innovation**,
- ▶ **knowledge and skills** of aquaculture producers and other operators.
- ▶ ***Good husbandry practices (animal health)***

Animal welfare in strategic guidelines on EU aquaculture

Recommended action

Commission

- ▶ Code of good practice on fish welfare
- ▶ Support development of fish welfare indicators by MS and industry
- ▶ Research and innovation (Horizon Europe)

EU MS

- ▶ Knowledge and skills on animal welfare
- ▶ Dissemination of code of good practice
- ▶ Information on research and innovation

AAC

- ▶ disseminate the code of good practice
- ▶ Information on research and innovation.

What's next?

Assistance mechanism

- Guidance and technical support
- On-line platform

Research and Innovation

MS National Strategic Plans/Funding

THANK YOU FOR YOUR ATTENTION

MARE-AQUACULTURE@ec.europa.eu

Interactive

FISH WELFARE

training

João L. Saraiva



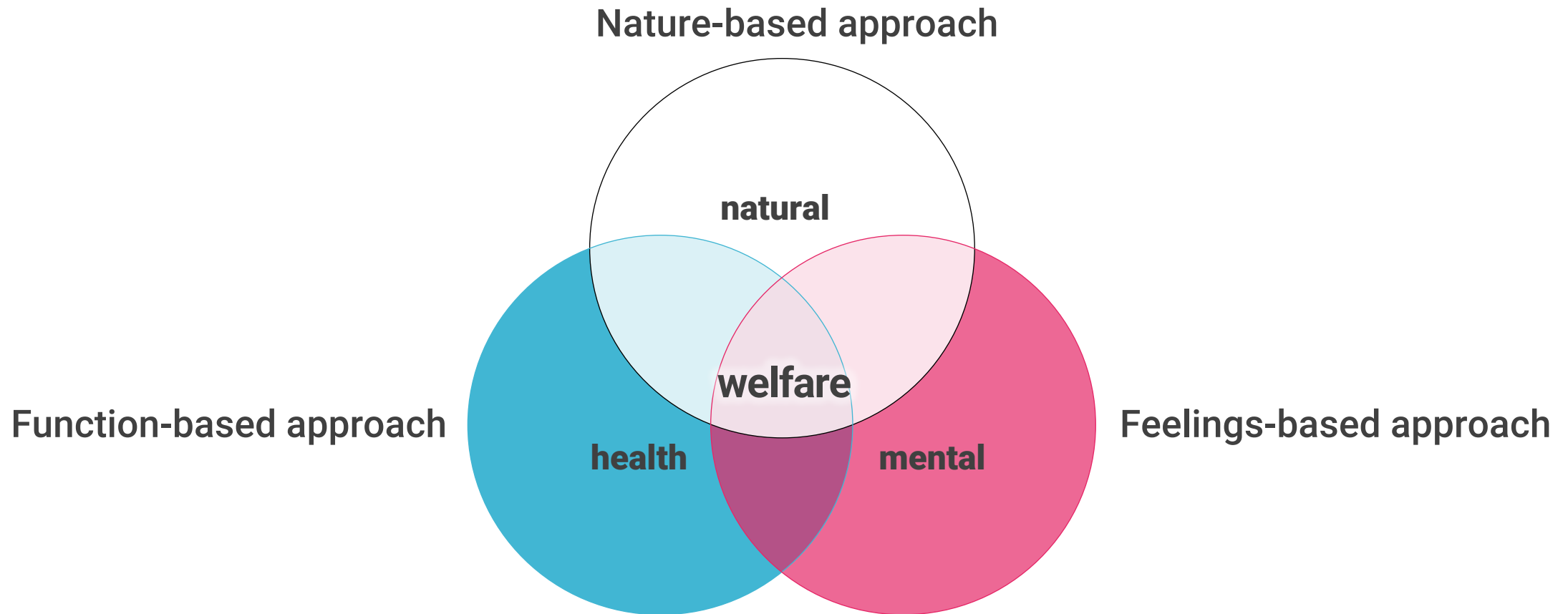
Assumptions:

- Welfare of fish is in every stakeholder's interest
- Welfare of farmed fish can be improved
- Knowledge gaps still exist
- Communication between parties is essential

Definitions:

Welfare: the individual's state as it copes with the environment

Definitions:

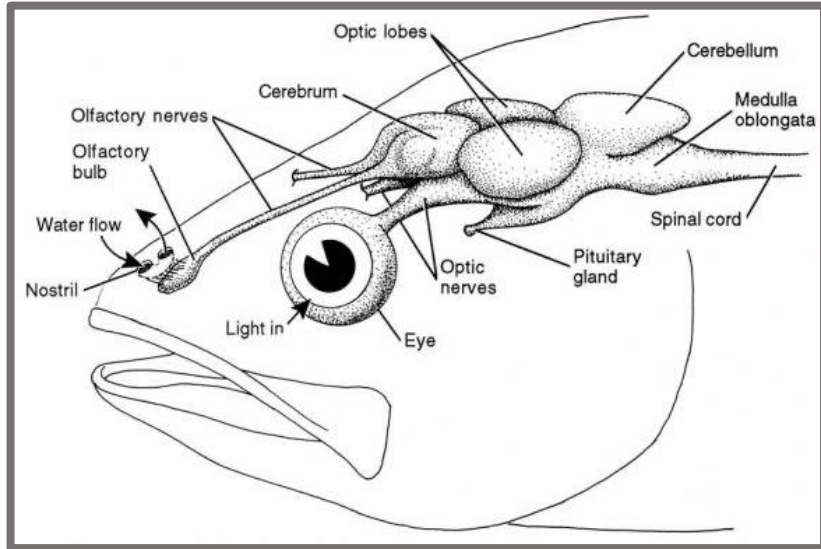


Definitions:

Welfare: the individual's state as it copes with the environment

Sentience: ability to experience positive and negative affective states, i.e. subjective, perceptual experiences

The fish mind: inner representation of the world



VISION: -foraging
-predation
-evasion

NOCICEPTION: -pain & suffering

**HYDROMECHANICAL
& ELECTROSENSING:**

- communication
- orientation
- navigation
- localization

Olfactory Taste Specialized cells

CHEMICAL SENSING: -orientation
-communication
-foraging
-predation
-evasion

HEARING: -communication
-decreasing aggression
-fighting assessment
-species recognition
-mate attraction and choice

Definitions:

Welfare: the individual's state as it copes with the environment

Sentience: ability to experience positive and negative affective states, i.e. subjective, perceptual experiences

Pain: An unpleasant sensory and emotional experience associated with, or resembling that associated with, actual or potential tissue damage.

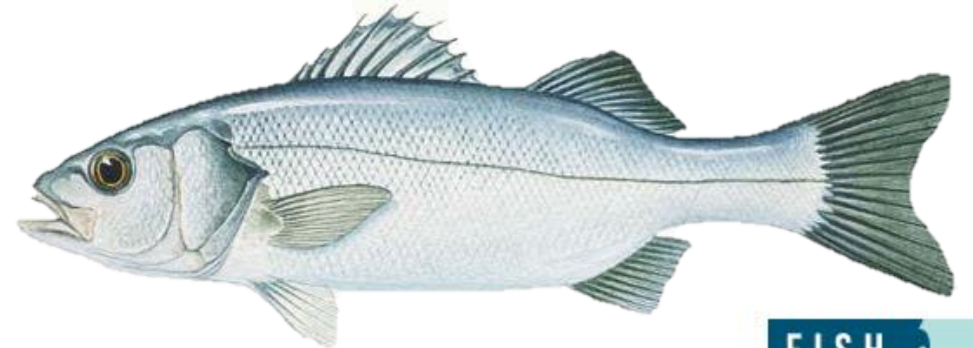
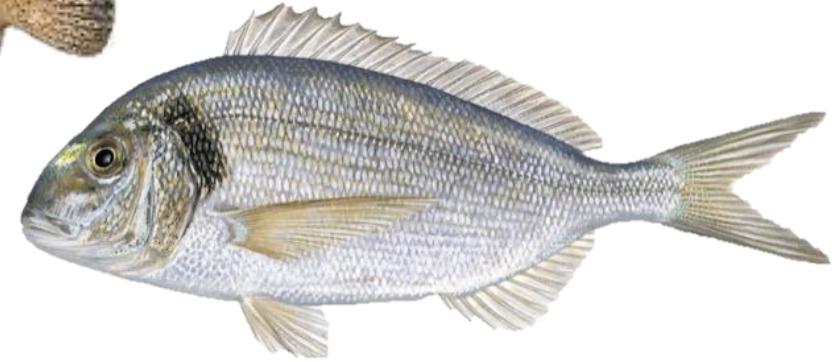
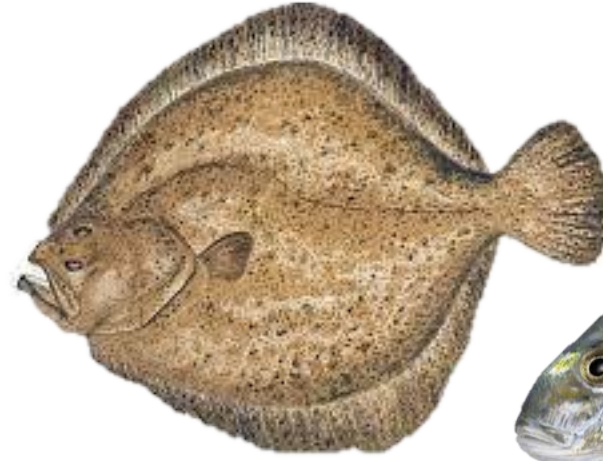
Fish are sentient

Pain Criteria for animals

Criteria	Mammals	Birds	Reptiles / Amphibians	Fish	Cephalopods	Decapods	Insects
Nociceptors, CNS pathways & processing	Green	Green	Green	Green	Green	Green	Green
Analgesic receptors	Green	Green	Green	Green	Green	Green	Light Blue
Physiological responses	Green	Green	Green	Green	Green	Green	Light Blue
Learned avoidance	Green	Green	Green	Green	Green	Green	Green
Change in behaviour	Green	Green	Green	Green	Green	Green	Green
Protective behaviour	Green	Green	Green	Green	Green	Green	Light Blue
Drugs reduce response	Green	Green	Green	Green	Green	Green	Green
Self-admin of drugs	Green	Green	Light Blue	Green	Light Blue	Light Blue	Light Blue
Pain takes priority	Green	Light Blue	Light Blue	Green	Green	Green	Light Blue
Change in behavioural preferences/choices	Green	Green	Light Blue	Green	Green	Green	Green
Pay cost to avoid pain	Green	Green	Light Blue	Green	Light Blue	Green	Light Blue
Trade off pain with other requirements	Green	Green	Light Blue	Green	Light Blue	Green	Light Blue

Adapted from Walters 2018

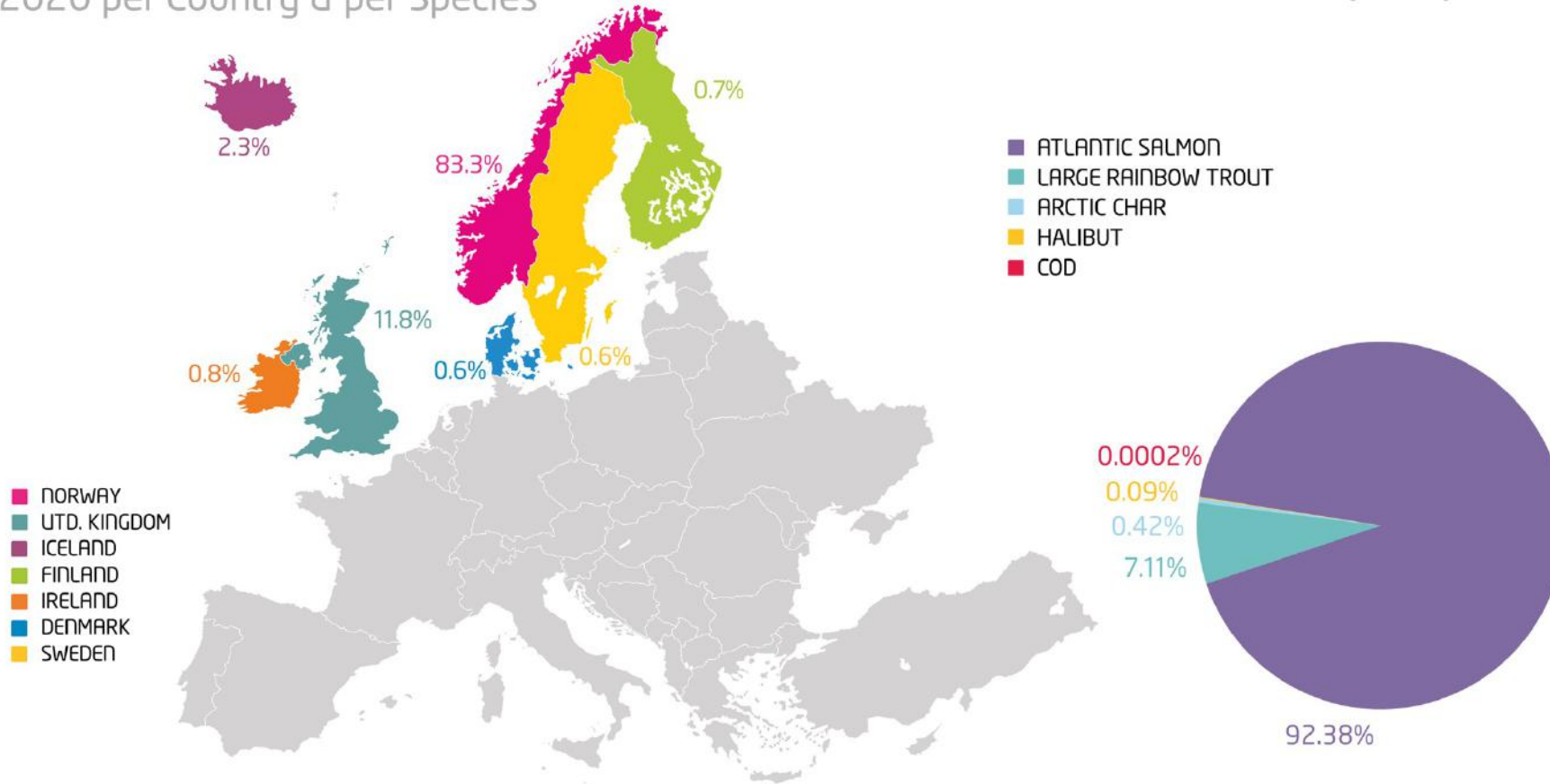
Diversity in species



Diversity in species

Marine Cold Water Production
in 2020 per Country & per Species

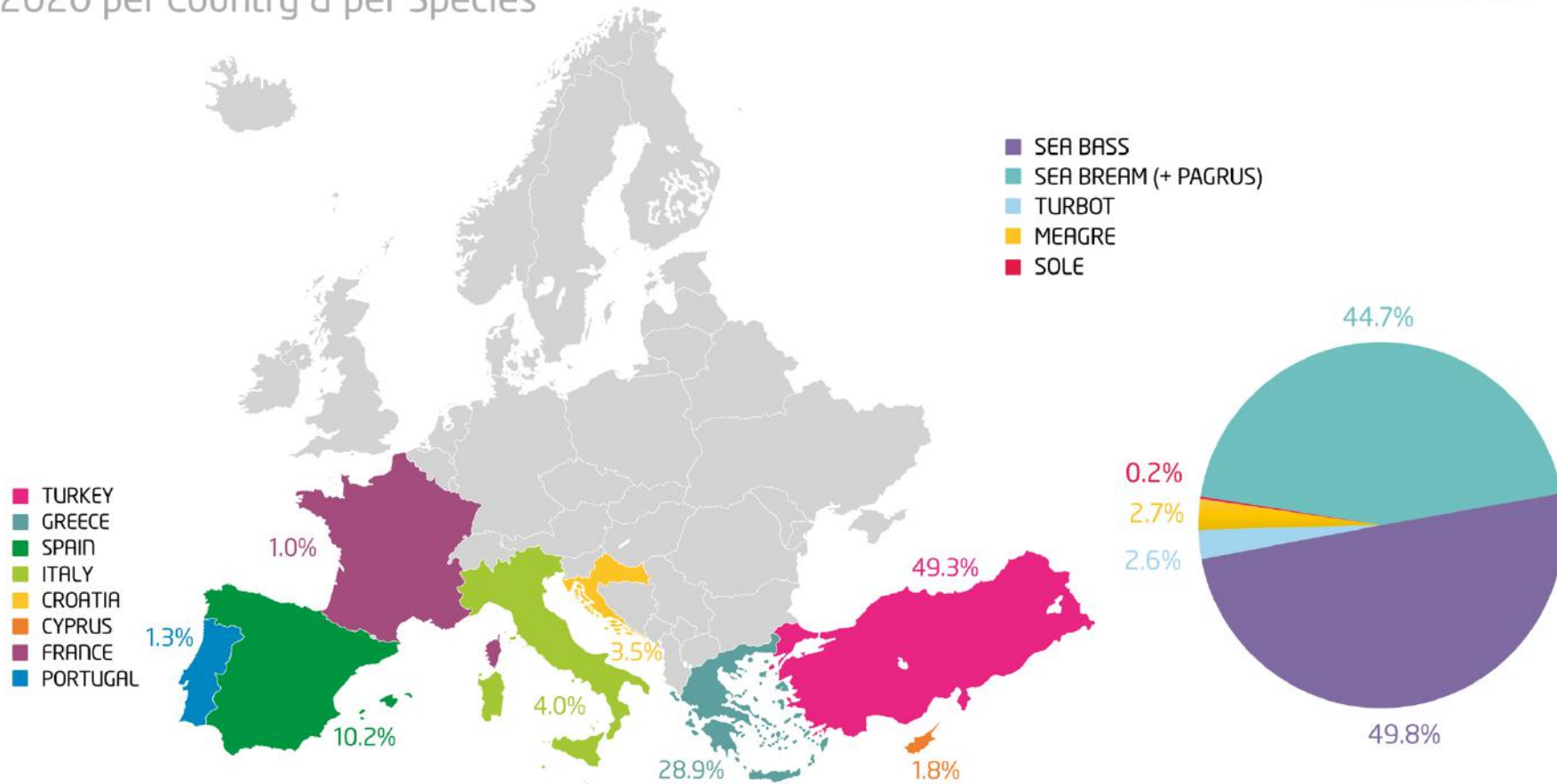
1,791,495 T



Diversity in species

Marine Mediterranean Production
in 2020 per Country & per Species

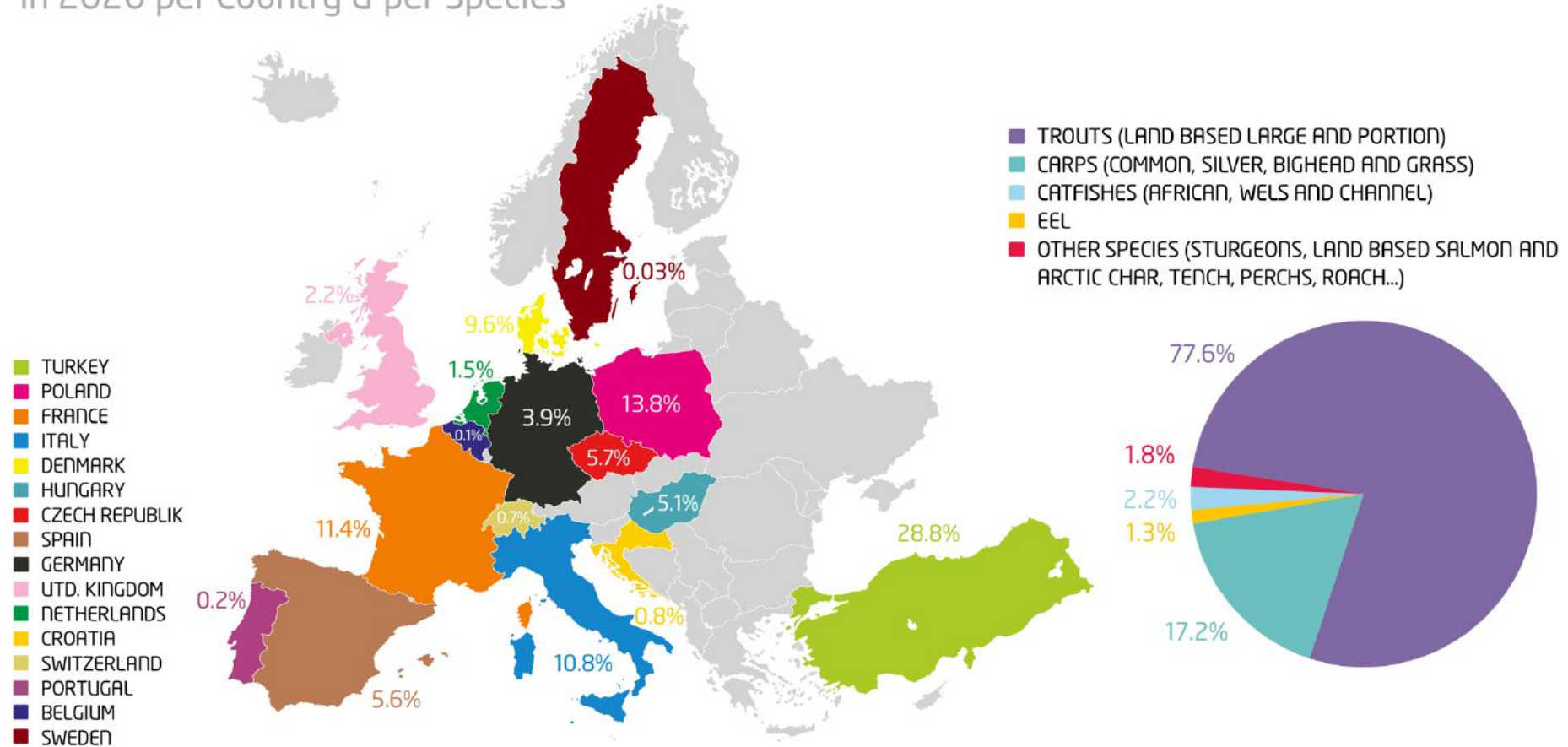
422.837 T



Diversity in species

Freshwater Production
in 2020 per Country & per Species

356.318 T



Diversity in fish farming methods



Sea cages



Earthen ponds

Diversity in fish farming methods

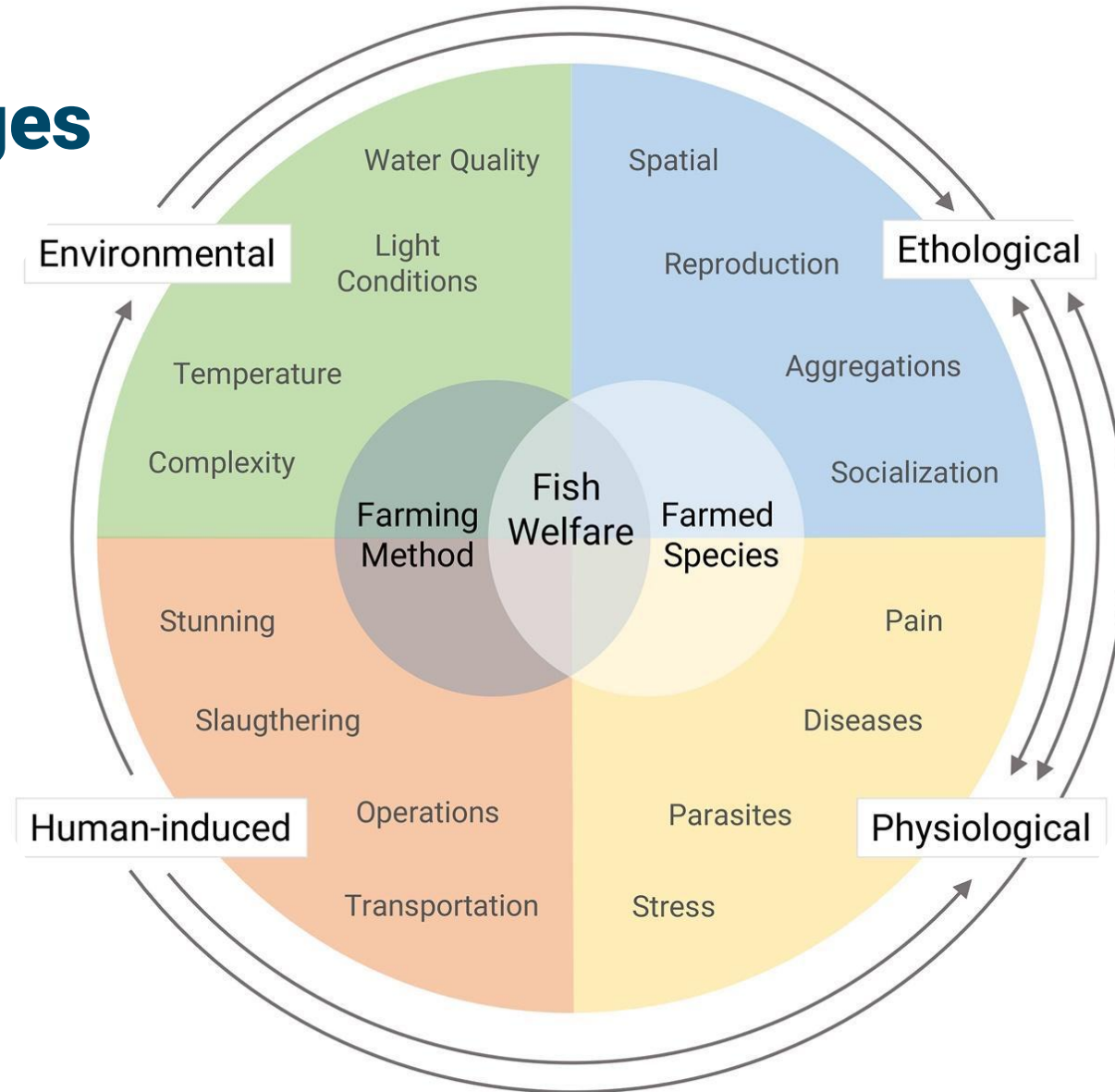


Concrete raceways

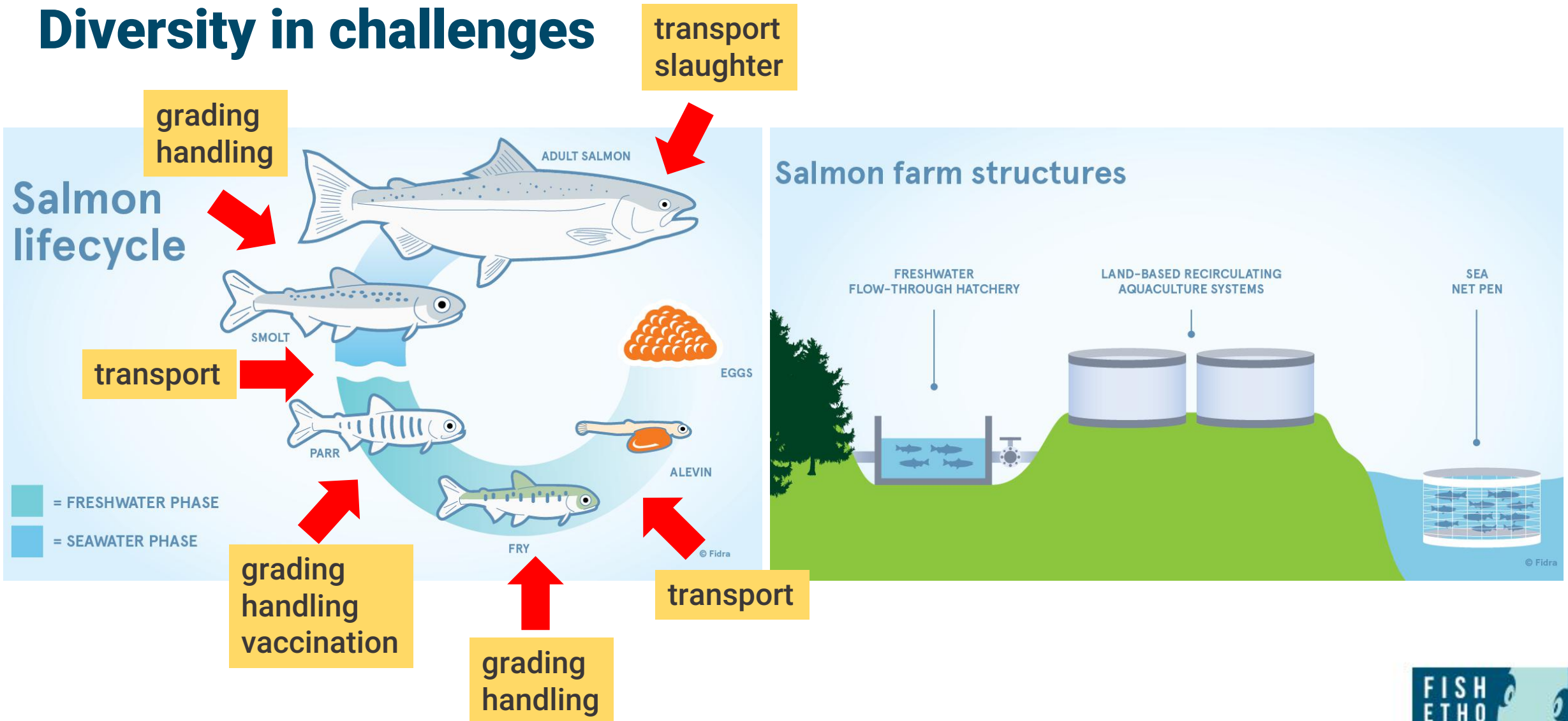


RAS systems

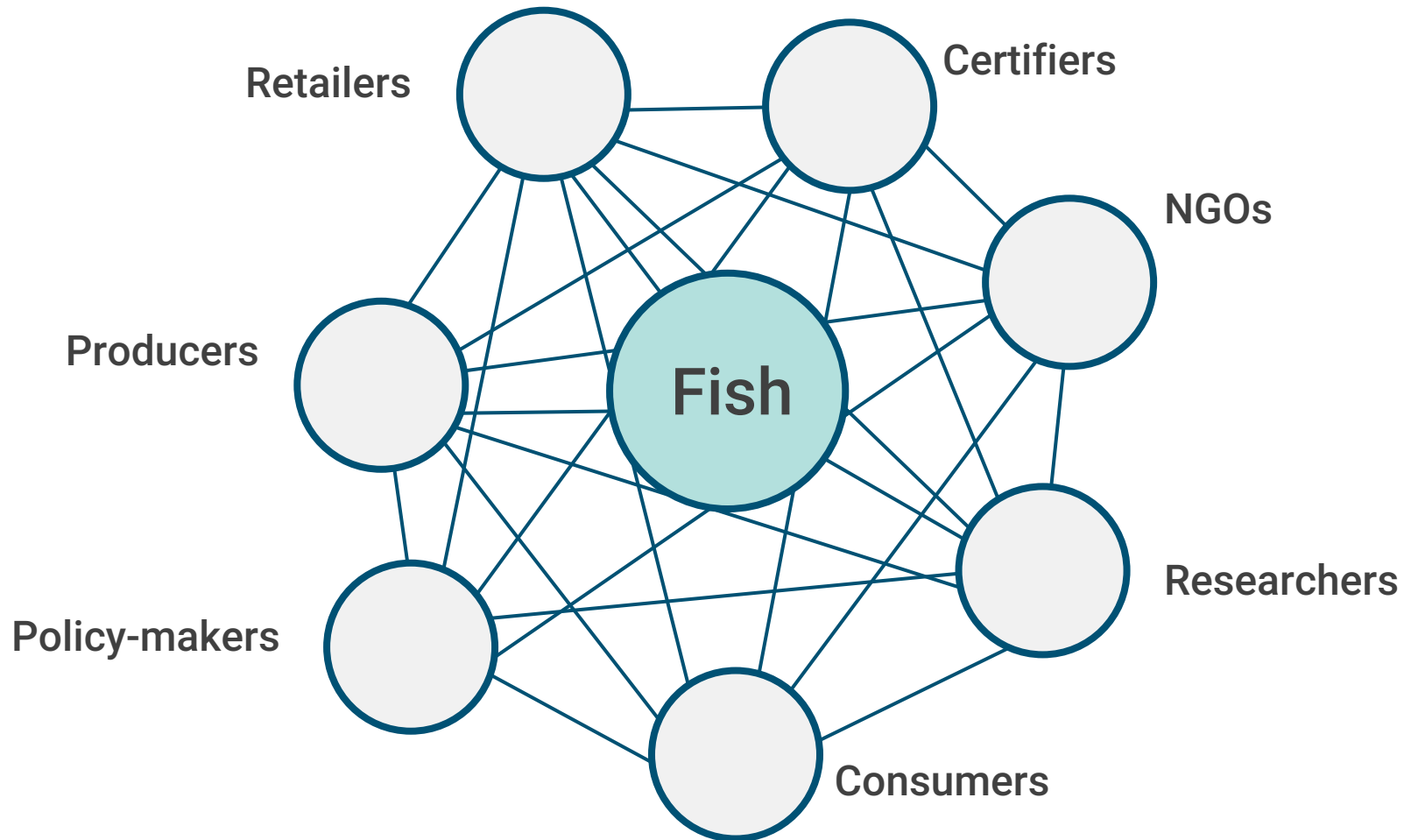
Diversity in challenges



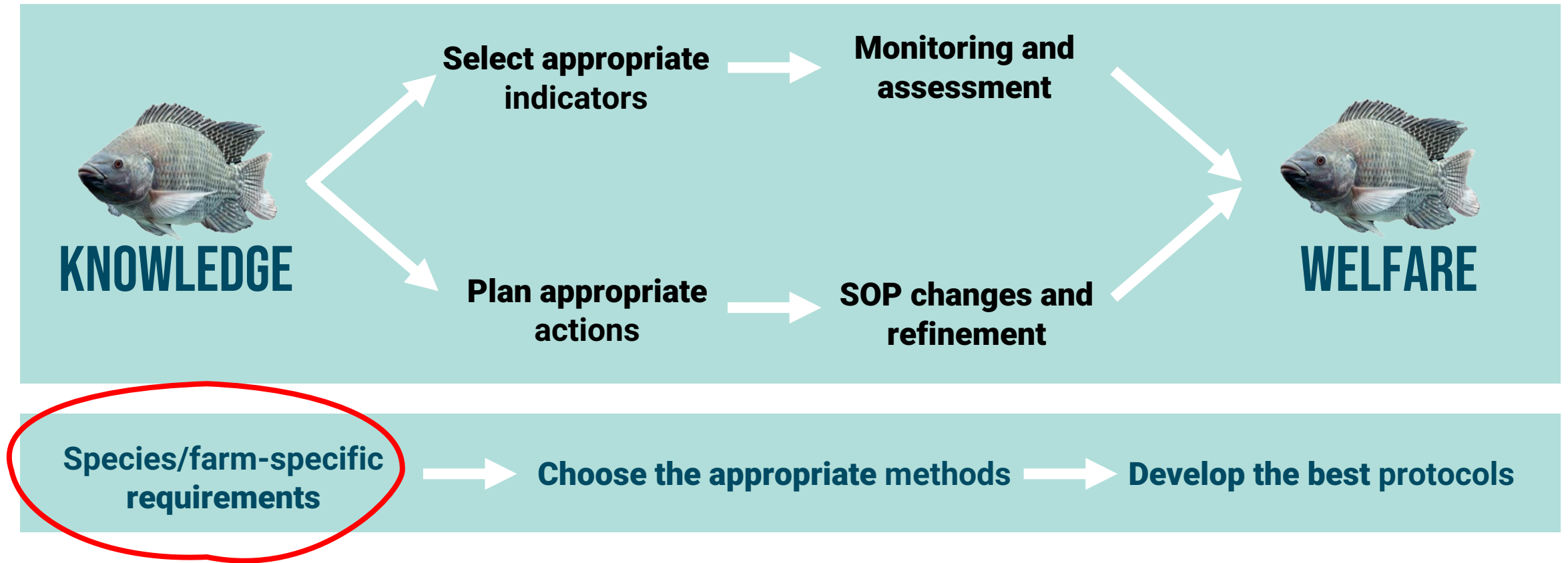
Diversity in challenges



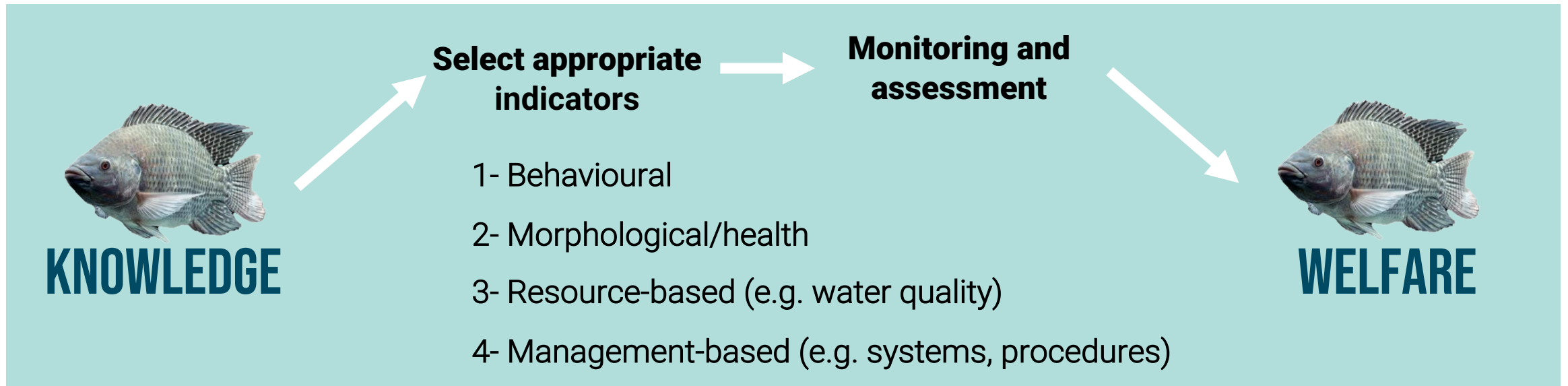
Science-based collaborative approach:



Science-based collaborative approach:



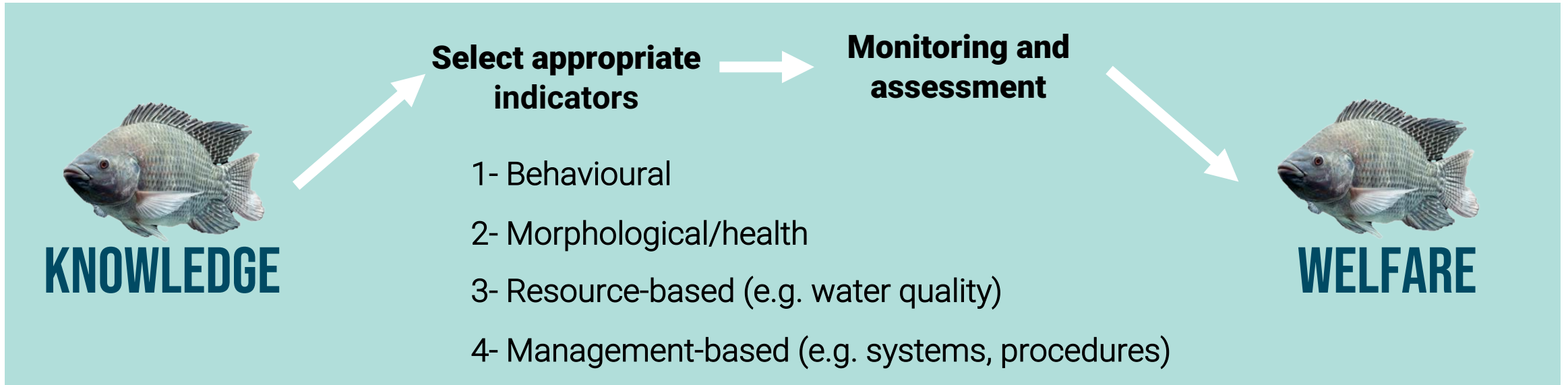
Indicators:



Which would you consider to be the most reliable indicators of welfare?

Use the poll in your zoom app

Indicators:



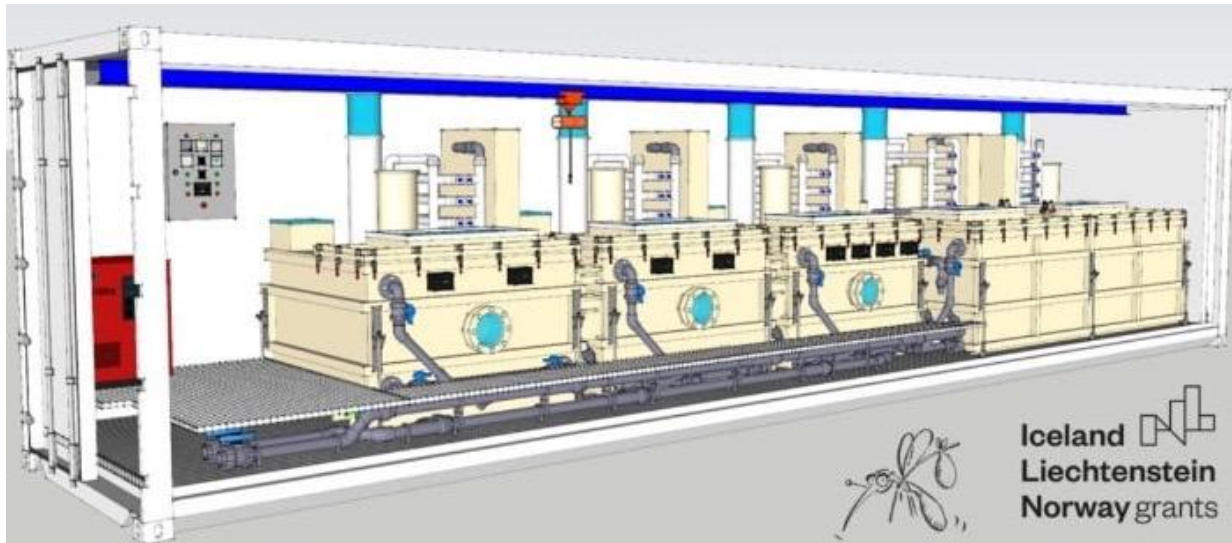
All are reliable -> context is everything!

What can be done?

- **Assess species-specific requirements**
- **Provide species-specific needs**
- **Improve the life and the death of farmed fish**

Two examples to work with:

Transport



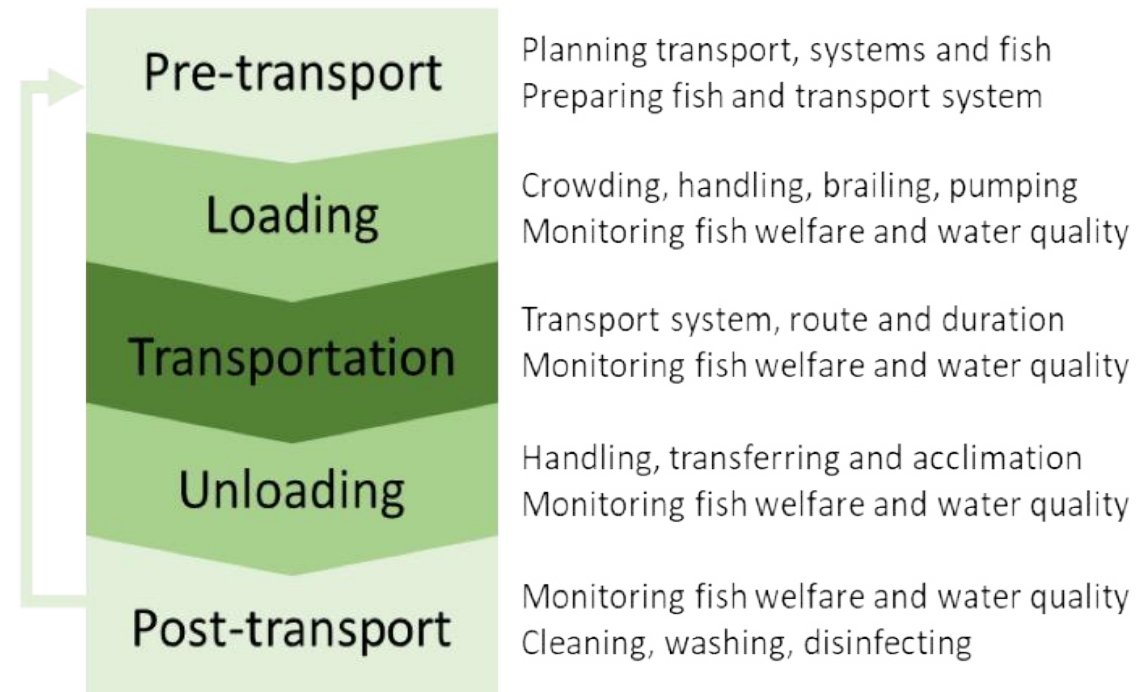
Slaughter



Transport



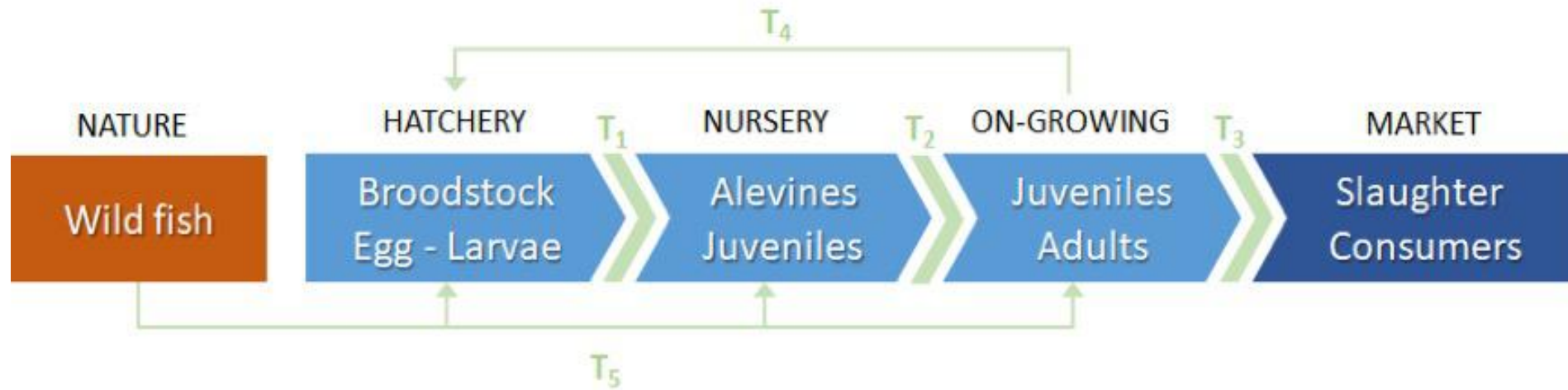
Live fish transportation phases



Transport



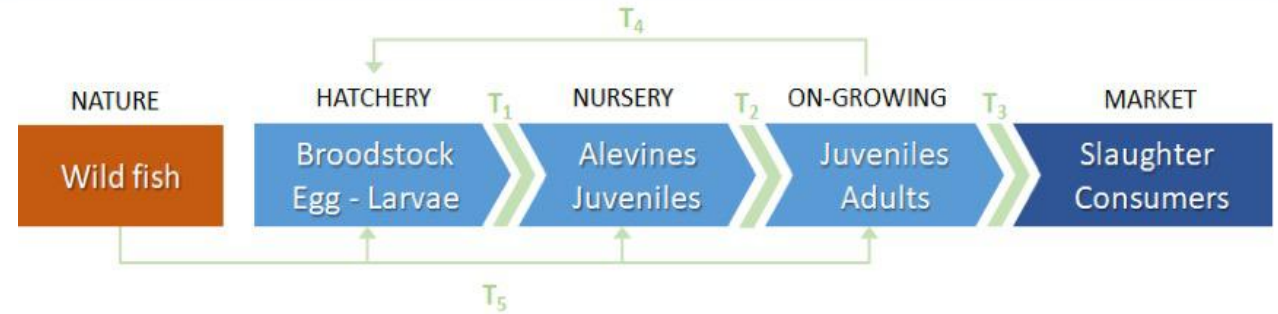
Transport



What would you consider to be the most stressful stages of transport for seabream / salmon / catfish?

Use the poll in your zoom app

Transport



Gilthead seabream. Severe stress in *loading*, when crowded, exposed to air or confined (**all**). Water quality deteriorates significantly when water exchange is low and temperatures are high (**all**).

Atlantic salmon. Extra challenges in *pre-transport procedures* of smolt (juveniles) from freshwater to sea water (T2). Excessive starvations periods increase aggression and fin damage (**all**). Sensitive to accumulation of CO₂ during *loading* and *transport* (**all**).

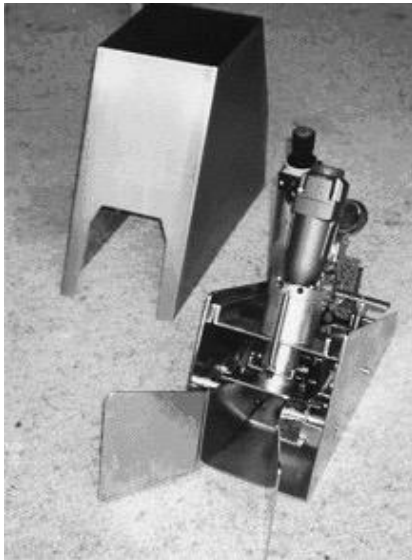
African catfish. Experiences the most stress during *transport* itself and sensitive both to too high densities and too low densities (**all**).

Slaughter

Stunning methods



Gas



Percussive



Electrical - wet

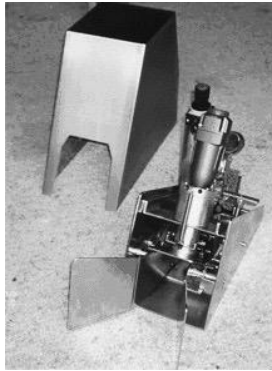


Electrical - dry

Slaughter



Gas



Percussive

Stunning methods



Electrical - wet



Electrical - dry

Which would you consider to be the most appropriate stunning method for seabream / salmon / catfish?

Use the poll in your zoom app

Slaughter

Asphyxia on ice

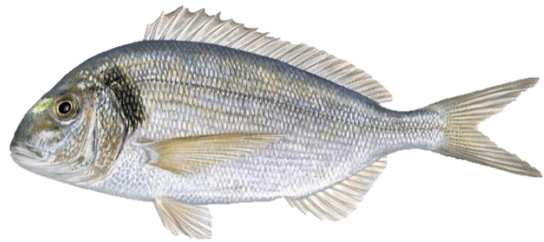


- **Prolonged suffering (>40 min)**
- **Depletion of energy reserves**
- **Tissue acidification**
- **Loss of quality**

Slaughter



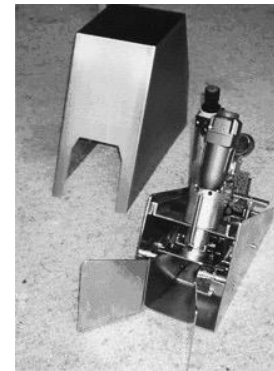
Slaughter



Electrical - dry



Electrical - wet



Percussive



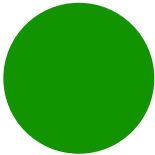
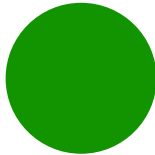
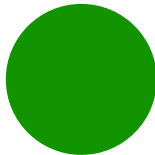
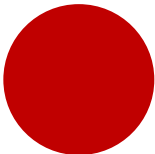
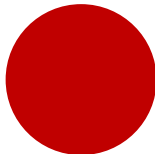
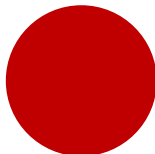
Slaughter



Slaughter



Slaughter

	Flesh quality	Shelf-life	Market value
Stunning			
No stunning			

Slaughter

Flesh quality, Welfare, Market value

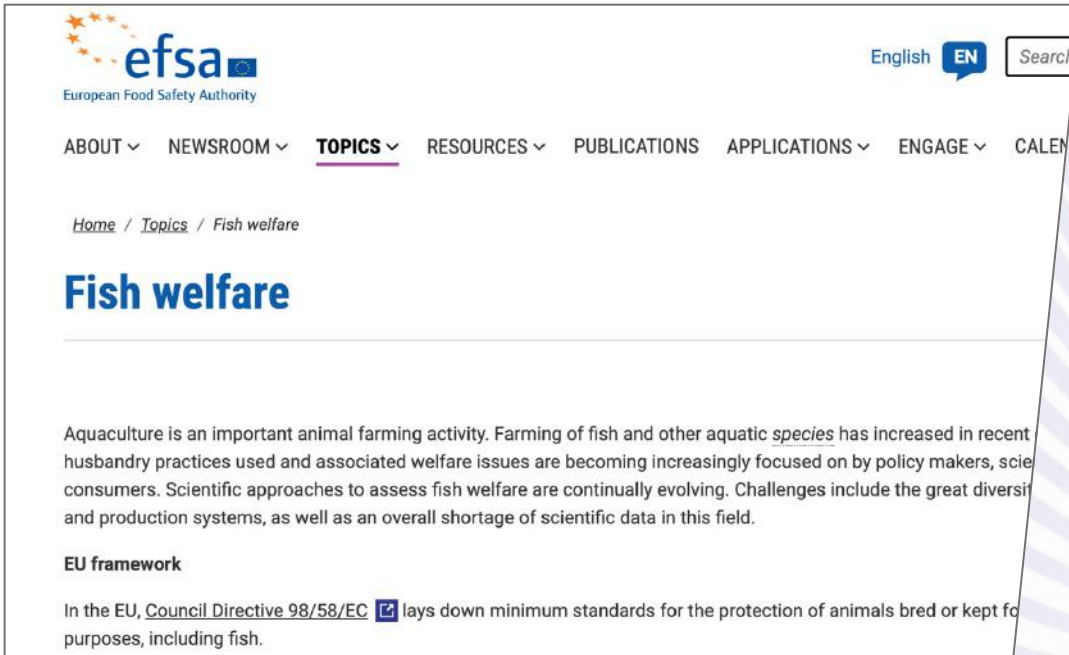
appropriate crowding & pre-slaughter procedures

Stunning

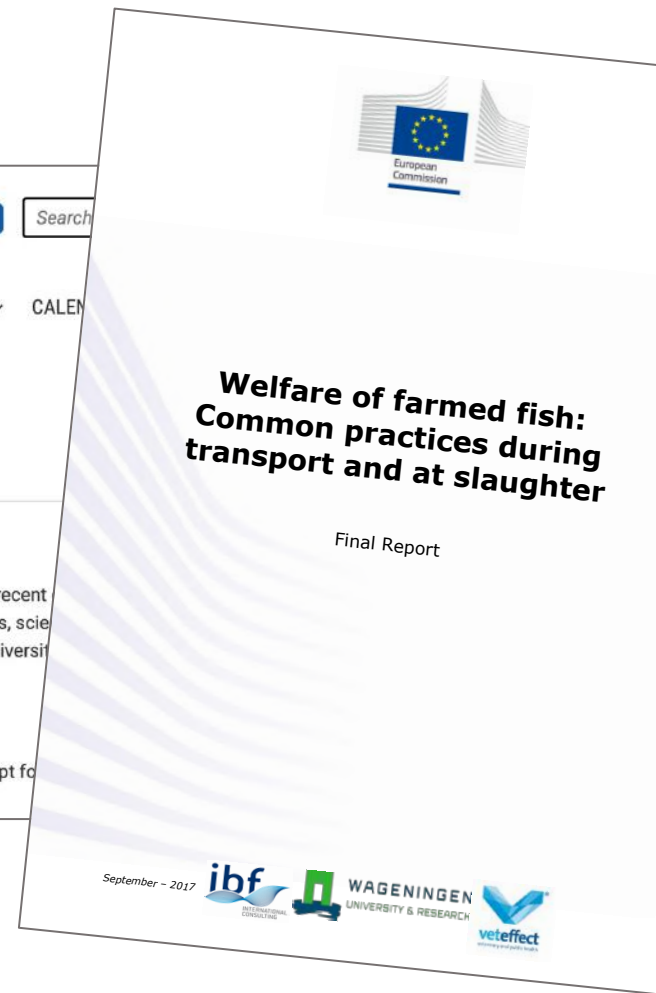
No stunning

TRAINING

Resources



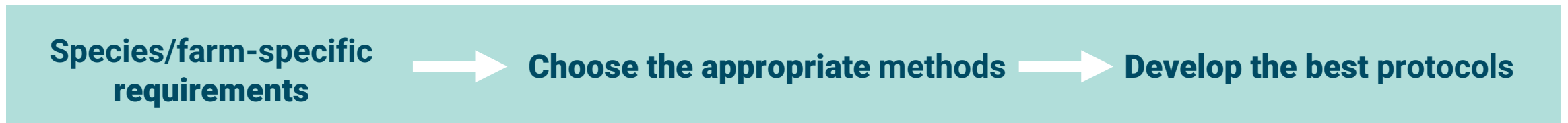
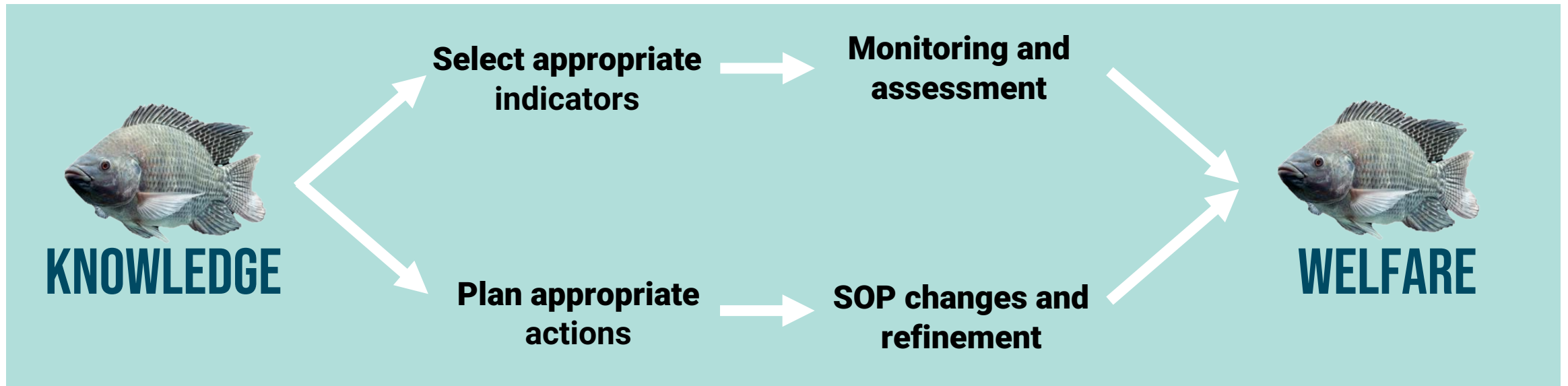
The screenshot shows the EFSA website interface. At the top left is the EFSA logo (European Food Safety Authority). To the right, there is a language selector set to 'English EN' and a search bar. Below the navigation menu, the breadcrumb trail reads 'Home / Topics / Fish welfare'. The main heading is 'Fish welfare'. The introductory text states: 'Aquaculture is an important animal farming activity. Farming of fish and other aquatic species has increased in recent husbandry practices used and associated welfare issues are becoming increasingly focused on by policy makers, scientists and consumers. Scientific approaches to assess fish welfare are continually evolving. Challenges include the great diversity and production systems, as well as an overall shortage of scientific data in this field.' Below this, there is a section titled 'EU framework' which mentions 'Council Directive 98/58/EC' and its purpose.



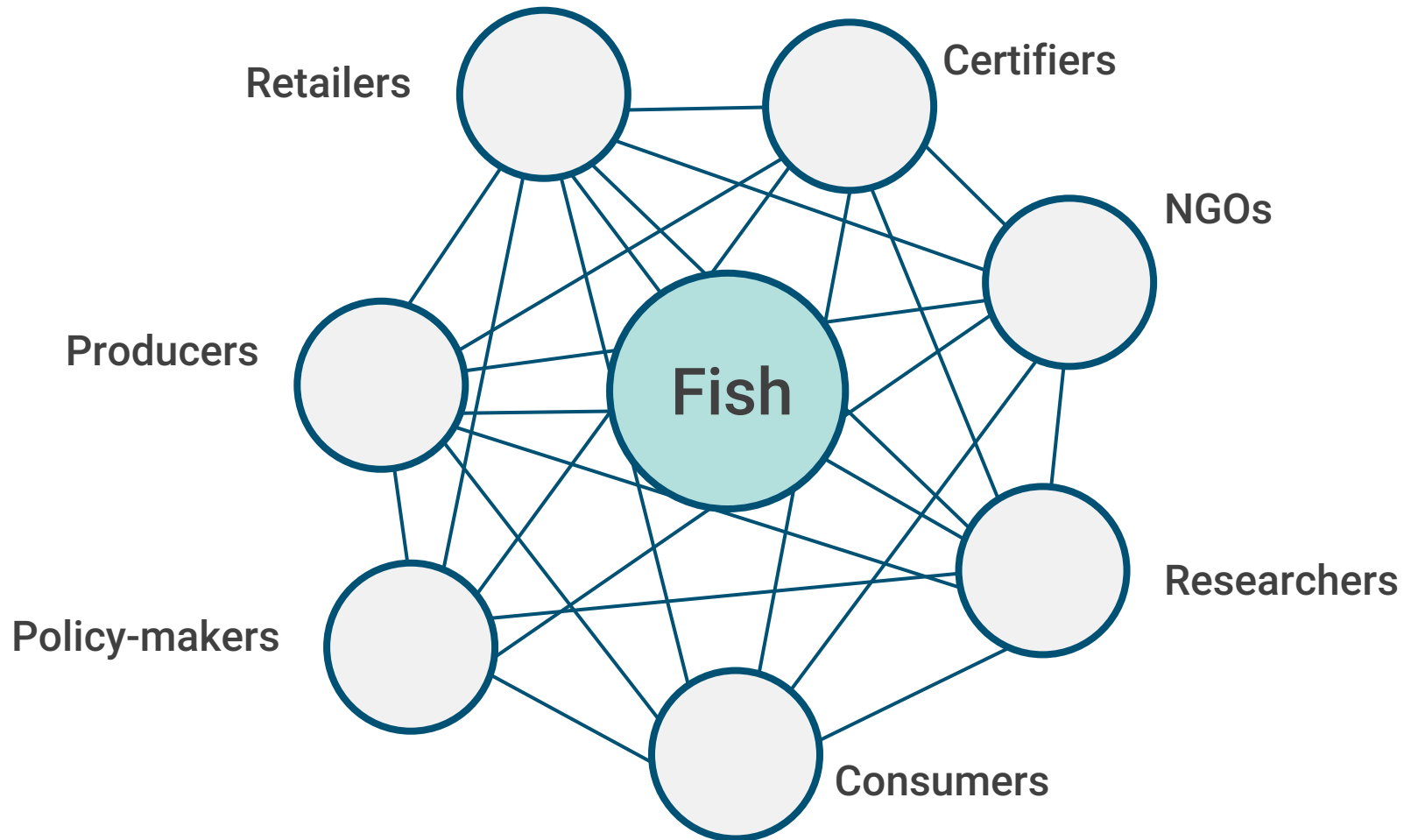
The cover features the European Commission logo at the top. The title is 'Welfare of farmed fish: Common practices during transport and at slaughter'. Below the title, it says 'Final Report'. At the bottom, there are logos for 'ibf' (International Board on Aquaculture), 'WAGENINGEN UNIVERSITY & RESEARCH', and 'veteffect'. The date 'September - 2017' is also present.



The cover features the European Parliament logo at the top right. It is labeled as a 'STUDY' requested by the ANIT Committee. The title is 'Particular welfare needs in animal transport: aquatic animals'. Below the title, it mentions a 'Workshop on Animal Welfare during Transport of 25 May 2021'. There is a central image of a large fishing vessel with several circular pens. Below the image is the text 'Protection of Animals during Transport'. At the bottom, there is a QR code, the text 'Policy Department for Structural and Cohesion Policies Directorate-General for Internal Policies PE 690.875 - May 2021', and the language code 'EN'.



Science-based collaborative approach:



THANK YOU

João L. Saraiva

www.fishethogroup.net



Revision of the EU Animal Welfare legislation



Kornilia Zafeiropoulou, DG SANTE/G5
Eurogroup for animals Event
**“Fish Welfare in Aquaculture: the practical approach
to husbandry, health and consumers” 22 March 2022**

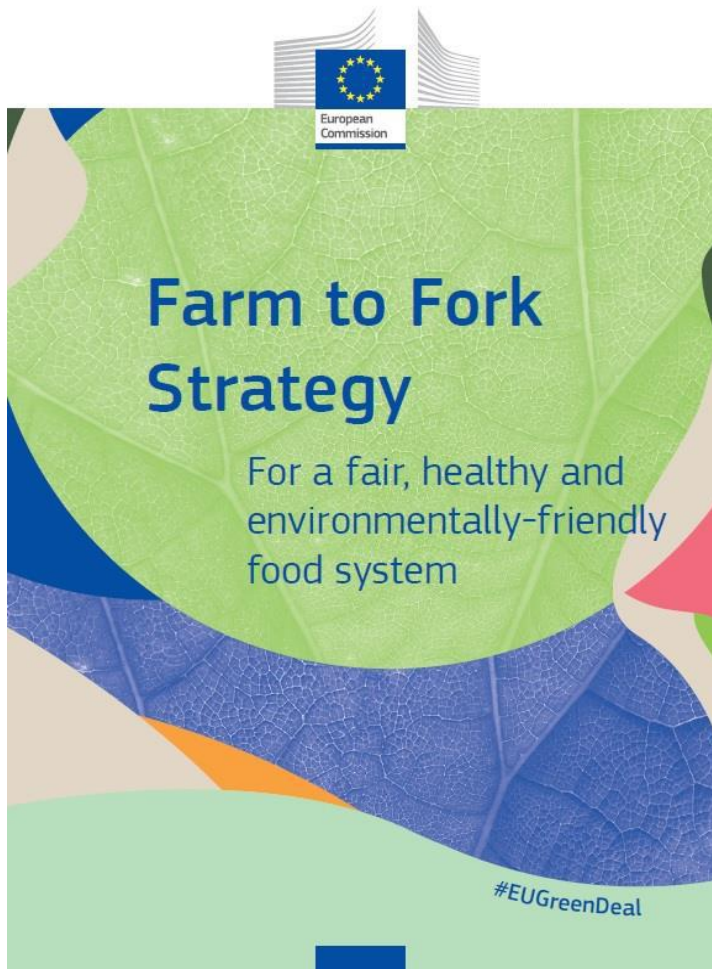


European
Commission

EU animal welfare legislation

- Article 13 TFEU
- **5 Directives** on animals kept in farms:
 - All farm animals
 - Laying hens
 - Calves
 - Pigs
 - Chickens for meat production
- **2 Regulations**:
 - Animal transport
 - Killing of animals

Farm to Fork Strategy



“Better animal welfare improves animal health and food quality, reduces the need for medication and can help preserve biodiversity.”

*“The Commission will **revise the animal welfare legislation**, including on animal **transport** and the **slaughter** of animals, to align it with the latest scientific evidence, broaden its scope, make it easier to enforce and ultimately **ensure a higher level of animal welfare.**”*

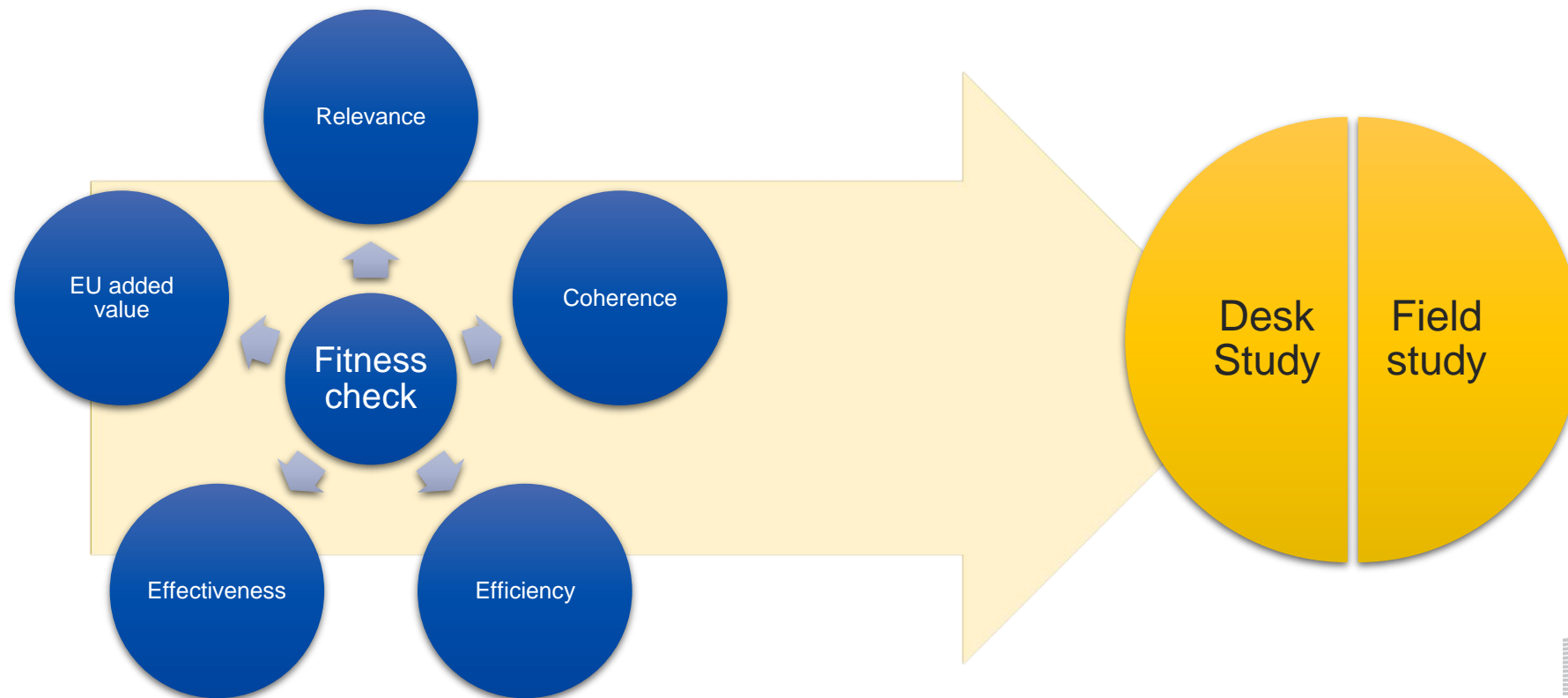
Better Regulation steps to the proposal(s)

- 1) Fitness Check of current legislation
- 2) Inception Impact Assessment /Impact assessment

“A way of working to ensure that policy is prepared, implemented and reviewed in an open, transparent manner, informed by the best available evidence and backed up by the comprehensive involvement of stakeholders.”

1. Fitness Check

- Evaluation of the existing EU animal welfare legislation



Fitness Check: preliminary results

- Lack of clarity of certain provisions.
- Lack of specific, updated and detailed requirements.
- Lack of tools to monitor, measure and report.
- Lack of training and competencies.
- Insufficient and uneven information to consumers.

2. Impact Assessment



Ref. Ares(2021)4402068 - 06/07/2021

INCEPTION IMPACT ASSESSMENT	
Inception Impact Assessments aim to inform citizens and stakeholders about the Commission's plans in order to allow them to provide feedback on the intended initiative and to participate effectively in future consultation activities. Citizens and stakeholders are in particular invited to provide views on the Commission's understanding of the problem and possible solutions and to make available any relevant information that they may have, including on possible impacts of the different options.	
TITLE OF THE INITIATIVE	Revision of the EU legislation on animal welfare
LEAD DG (RESPONSIBLE UNIT)	SANTE (Unit G5: Animal Welfare and Antimicrobial Resistance)
LIKELY TYPE OF INITIATIVE	Legislative proposal of the European Parliament and of the Council
INDICATIVE PLANNING	Q4 2023
ADDITIONAL INFORMATION	https://ec.europa.eu/food/animals/welfare/strategy/evaluation-eu-legislation-welfare-farmed-animals_en
The Inception Impact Assessment is provided for information purposes only. It does not prejudice the final decision of the Commission on whether this initiative will be pursued or on its final content. All elements of the initiative described by the Inception impact assessment, including its timing, are subject to change.	
A. Context, Problem definition and Subsidiarity Check	
Context	
EU animal welfare policy scope and principles derive from Article 13 of the Treaty on the Functioning of the EU, which recognises animals as sentient beings. Article 13 also recognises the need to respect the legislative or administrative provisions and customs of the Member States relating in particular to religious rites, cultural traditions and regional heritage.	
The EU legislation on the welfare of farmed animals consists of a Directive concerning the protection of animals kept for farming purposes and four Directives laying down minimum standards for the protection of laying hens , broilers , pigs and calves : one Regulation on animal transport and one Regulation on the protection of animals at the time of killing . In other words, it regulates animal welfare at farm level, during transport and at slaughter.	
The objectives of the EU legislation on animal welfare are to ensure by uniform application and enforcement the welfare of farmed animals, while at the same time allowing rational production and fair competition for EU business operators within the single market, and addressing expectations among citizens and consumers.	
Under the Farm to Fork Strategy (F2F), the Commission committed to revise this legislation and consider options for animal welfare labelling. The purpose of the revision is to ensure a higher level of animal welfare, broaden the scope of the EU animal welfare legislation, align it with the latest scientific evidence and current political priorities as well as citizen's expectations and make it easier to enforce. Animal welfare is a key component of sustainability in our food chain.	
On 30 June 2021, the Commission announced in its reply to the 'End of Cages' citizens' initiative that it will put forward a legislative proposal to phase out and finally prohibit the use of cages for certain species in the EU.	
The revision of the EU animal welfare legislation covers animals – including fish and fur animals – bred and kept for farming purposes, as well as cats and dogs insofar as transport for commercial purposes is concerned. It does not cover wild animals, experimental or laboratory animals (with exception for their welfare during transport) or any invertebrate animals.	
To gather evidence to feed into such revision, the Commission initiated in 2020 a fitness check of the current rules on the welfare of animals at farm, during transport and at slaughter, to be concluded in 2022. While the fitness check is still ongoing, available information points to weaknesses in the design, implementation, compliance and enforcement of the EU animal welfare legislation. Among others, the current rules seem to be outdated in light of new science and technology, and the lack of clarity of certain provisions results in divergent transposition and implementation across the EU Member States. In turn, this creates an uneven playing field for EU business operators and poses additional challenges to a proper, effective and uniform enforcement by the competent	

- Launched with an “Inception Impact Assessment”
- Policy options regarding 4 welfare areas: on the farm, during transport, at the time of killing and animal welfare labelling
- Feedback period: 06/07-24/08/2021 (i.e. seven weeks)
- 983 contributions received.
- **Open Public Consultation** until 21.01.2022:
- 59281 contributions received.

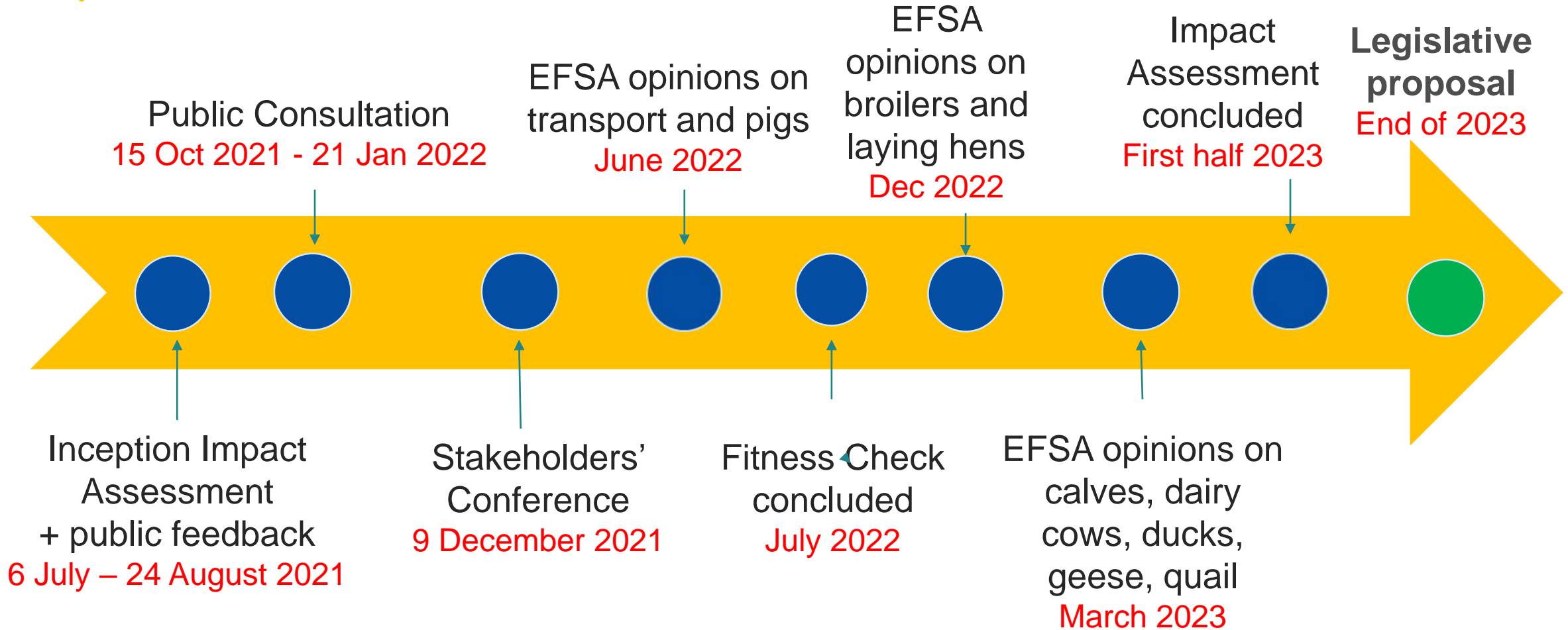
Scientific basis for the proposals

Ongoing main EFSA mandates on animal welfare

Mandate*	Agreed deadline
Transport	June 2022
Pigs	June 2022
Broilers**	December 2022
Laying hens**	December 2022
Calves	March 2023
Ducks, geese, quail	March 2023
Dairy cows	March 2023

- Mandates for rabbits and for slaughter are already available.
- ** Also addressing broiler breeders, pullets and layer breeders.

Timeline



Roadmap of future mandates to EFSA

- 26 October 2021: Commission sent roadmap to EFSA indicating its planned future mandates in the area of farm animal welfare, after 2023:
 - Beef cattle
 - Sheep and goats
 - Turkeys
 - **Farmed salmon and trout** (June 2026); **farmed carp** (June 2027); **farmed sea bass, sea bream, European eel** (June 2028); **farmed tune** (December 2029)
 - Ducks, geese and quail
 - Equines
 - Minks, racoon dogs, foxes
 - **Certain invertebrates such as decapods** (December 2030)

Specific actions related to aquatic animals

- **Inception Impact Assessment** includes 2 options for the **killing of fish**:
 - Option 1 : provisions for the **five main species** of farmed fish (Atlantic salmon, common carp, rainbow trout, European sea bass and gilthead sea bream)
 - Option 2 : provisions for **two species** (European sea bass and gilthead sea bream)
- **EFSA roadmap**
 - Scientific opinions on other aspects than killing
 - Published on SANTE website (https://ec.europa.eu/food/system/files/2021-10/aw_eval_revision_roadmap_efsas.pdf).



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