
Demonstration of Innovative Functional food production systems based on more sustainable value chains of marine and freshwater raw materials for conscientious EU consumers

A large, stylized graphic on the left side of the slide. It consists of a green leaf-like shape at the top, a blue water droplet in the center, and three curved blue lines below. The entire graphic is composed of thick, rounded strokes.

1.0 Production techniques of marine and algae biomass in the context of sustainability

1.1 The 'One Health' approach

Main objective

 Understand the interrelation of health and the ecosystems

Learning outcomes

 Explain the 'One Health' approach and how aquaculture fits into that concept

 Gain knowledge on the environmental impacts of aquaculture

Agenda



One Health



The European approach to One Health



Aquaculture Overview



How can aquaculture be implemented into the concept of One Health?



One Health Implementation



Group exercises



(Wicked Problems)



Funded by
the European Union



What is ONE HEALTH?

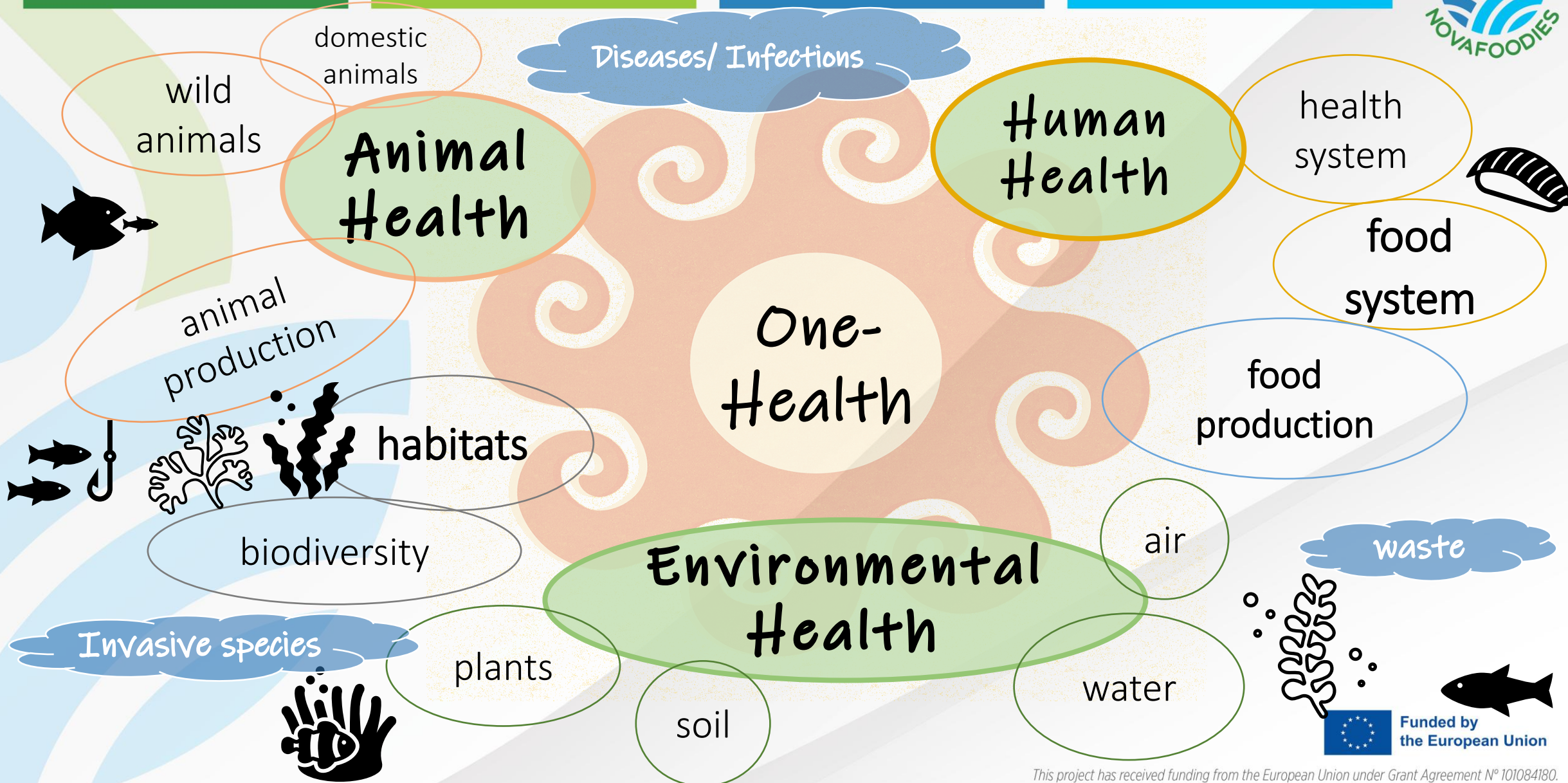


Funded by
the European Union

One Health – Definition

*One Health is an integrated, unifying approach that aims to **sustainably balance** and optimize the **health of people, animals and ecosystems**.*

“It recognizes the health of humans, domestic and wild animals, plants, and the wider environment (including ecosystems), which are closely linked and inter-dependent.” - EC



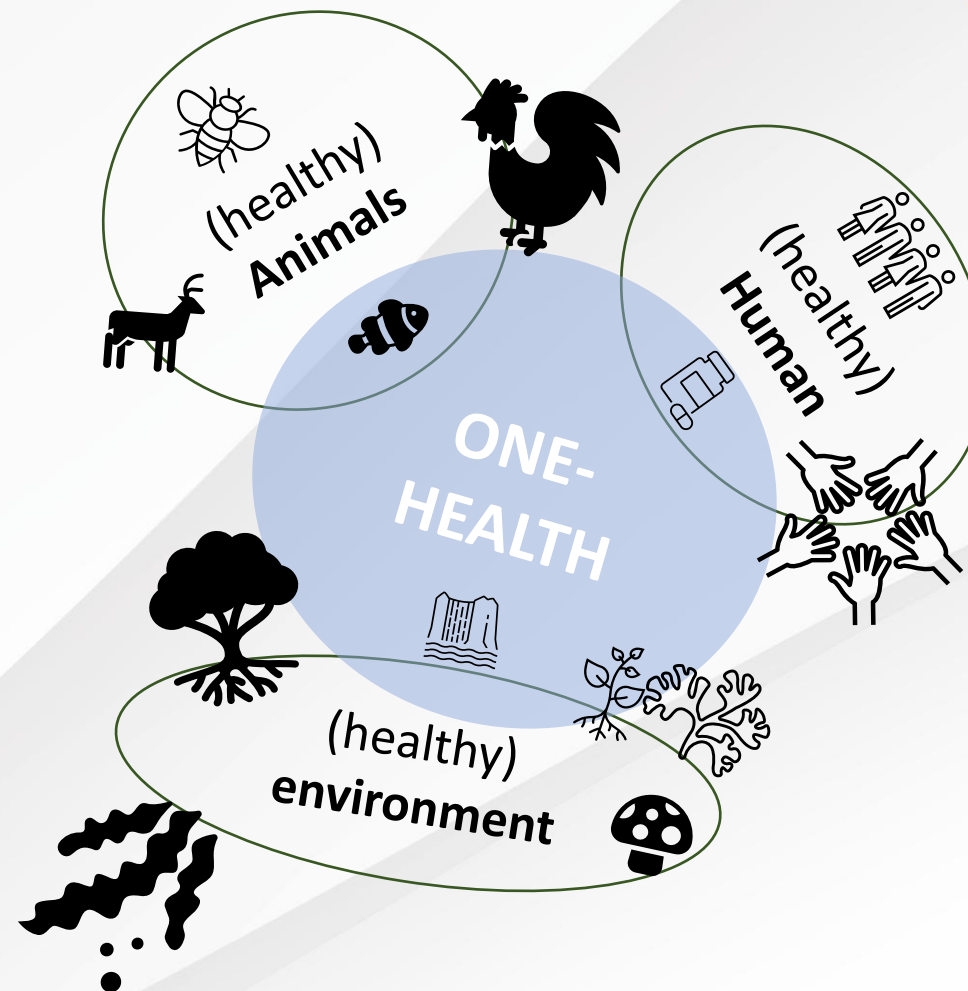
What does the European approach to One Health look like?

One Health – Definition

 Approach and way of thinking

 EQUAL optimization of

- Environmental health
- Animal health
- Human health



***Due to the interdependence of everything,
the impact of (human) actions has far-reaching and often
underestimated effects.***

*Ecosystems are affected by human activity.
Which in turn affect us.*

*That includes
physical-, biological-, chemical- and lifestyle
related risks.*



One Health – Goals of the European approach

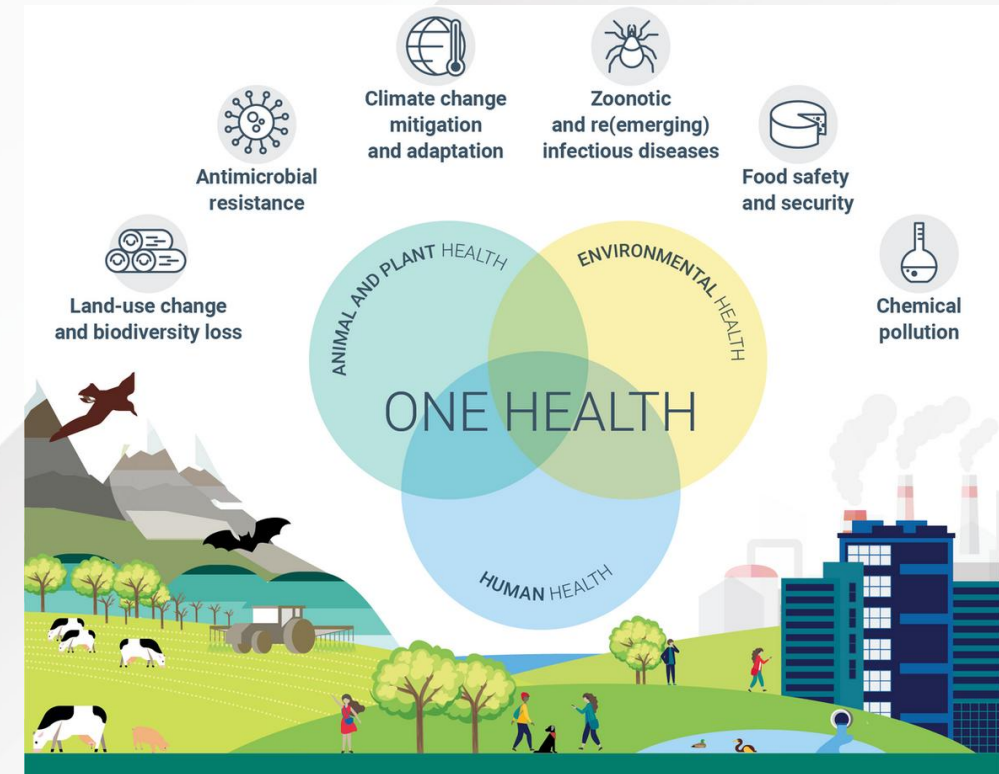
Contribute to a better human (“public”), animal and environmental health, including food safety.

Aims to sustainably balance and optimize the three.

One Health – Strategy of the EU

-  Building a strong European Health Union
-  Promote sustainable and safe food
-  Protect health and welfare of farmed animals
-  Protect health of crops and forests

- ➔ Monitoring the implementation of related laws
- ➔ Foster education and advanced training courses



European Environment Agency (EEA)



AQUACULTURE – a few figures



Funded by
the European Union

Aquaculture - a growing sector of the blue economy in Europe (1)

Total aquaculture production by other major producers (2019)

(value in thousand EUR and percentage of total, volume in tonnes live weight and percentage of total)

	Value	% Value	Volume	% Volume
China	143 968 509	58.68 %	68 423 859	56.97 %
Indonesia	13 018 009	5.31 %	15 893 400	13.23 %
India	12 965 661	5.28 %	7 800 300	6.49 %
Vietnam	10 758 166	4.38 %	4 455 557	3.71 %
Chile	9 788 299	3.99 %	1 407 286	1.17 %
Norway	7 281 989	2.97 %	1 453 042	1.21 %
Bangladesh	5 403 903	2.20 %	2 488 600	2.07 %
EU-28	4 985 551	2.03 %	1 366 682	1.14 %
Japan	4 599 929	1.87 %	943 748	0.79 %
Thailand	2 857 667	1.16 %	964 266	0.80 %
Egypt	2 556 831	1.04 %	1 641 949	1.37 %
South Korea	2 493 821	1.02 %	2 406 351	2.00 %
Ecuador	2 323 907	0.95 %	695 835	0.58 %
Philippines	2 032 010	0.83 %	2 358 238	1.96 %
Iran	1 645 936	0.67 %	505 000	0.42 %
Myanmar	1 645 752	0.67 %	1 082 153	0.90 %
Others	17 019 608	6.94 %	6 218 046	5.18 %
Total	245 345 548	100.00 %	120 104 313	100.00 %

Aquaculture – a growing sector of the blue economy in Europe (2)

 (Globally) fastest growing food production sector

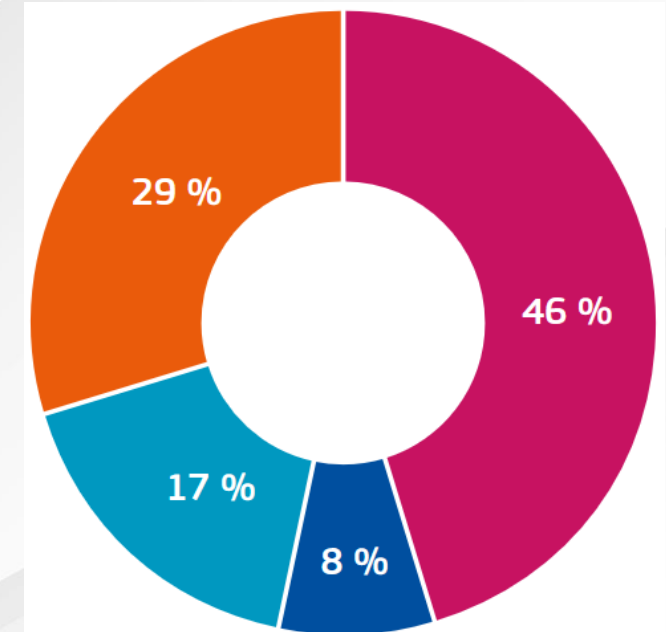
 Stable numbers in EU-Member states

 Around 22% of the EU's production stems from aquaculture

 Source of protein with lower carbon footprint

 Important contributor to food security, resilience and climate mitigation

European Union aquaculture production per product type (2018/2019)
(percentage of total volume)



■ Molluscs and crustaceans
■ Freshwater fish
■ Marine fish
■ Salmonids

Aquaculture – Actions of the European Union



Since 2021 new strategic guidelines to make aquaculture more sustainable and competitive

→ main objective of the common fisheries policy (CFP)



Recognised by the European Green Deal as a source of “low carbon” protein for food and feed, and an important contributor to food security, resilience and climate mitigation



*“Aquaculture provides over 50% of the global seafood supply and is one of the most resource-efficient forms of animal protein production, with significantly lower greenhouse gas emissions, land use, and freshwater use compared to terrestrial livestock.”
(Source: FAO, 2022; World Bank, 2013)”*



Funded by
the European Union

How does aquaculture fit into the concept of One Health?



Funded by
the European Union

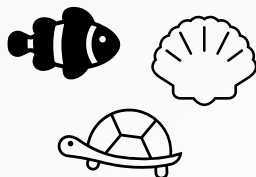
Aquaculture depends on and influences ...



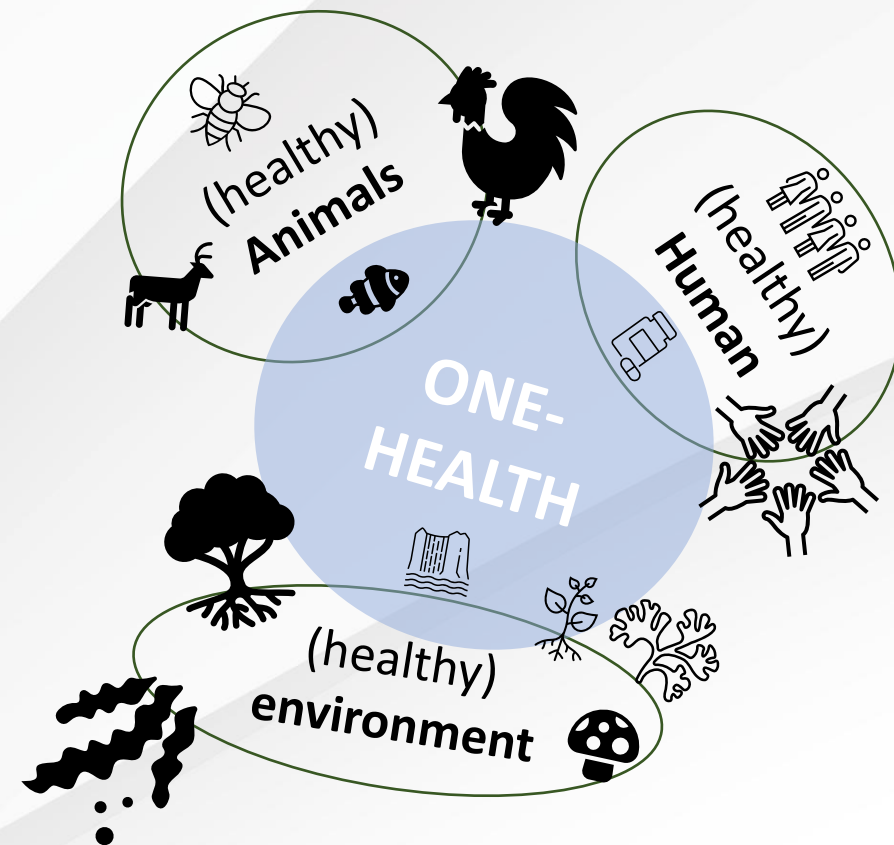
... natural ecosystems



... native and farmed animals



... human health and socioeconomic systems



Funded by
the European Union

Interactions with the environment

 Alterations of the natural habitat

 Source of waste

- Ballast water (potentially containing invasive species), fishing gear, oil-spills

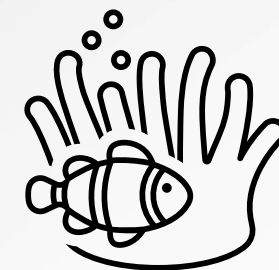
 Eutrophication and pollution

 Alteration of biodiversity:

- Introduction of invasive species, GMOs, overexploitation

 Physical changes

- Conversion of wetlands and other natural habitats for aquaculture



Interactions with (native) animals



Competition and predation

- Farmed species may escape and compete with native fauna



Disease transmission (zoonosis)

- Aquaculture can increase the prevalence of diseases and parasites



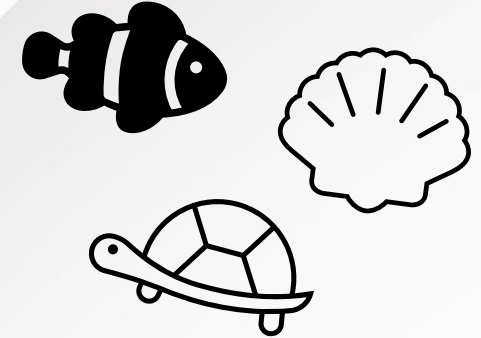
Genetic impacts

- Breeding and hybridization with wild relatives can reduce the genetic diversity and resilience of native species



Antibiotic resistance

- Use of antibiotics to control disease can contribute to the development and spread of antibiotic-resistant bacteria, posing a risk to both animal and human health



Interactions with human health



Food production (economic and social aspects)

- Support local livelihoods



Provisioning services (healthy food)

- Source of nutrition (omega-3 fatty acids, etc.)
- Food safety and security
- Climate mitigation



Source of pollutants (antibiotics, hormones, pesticides)



Challenges for the aquaculture sector: What is done to implement One Health in this area?



Funded by
the European Union

Main Aspects

➤ Rising demand of aquatic products

Due to:

-  Growing human population
-  High-protein and healthy diet trends
-  Low-carbon footprint protein source

→ While nature is visibly suffering and resource scarcity is becoming an increasingly relevant issue.

Aquaculture within the EU

 *Regulated, shaped and made more sustainable by various*

- Policies
 - Common fisheries policy (CFP)
 - Marine Strategy Framework Directive (MSFD)
- Agreements / Roadmaps
 - European Green Deal (Farm to Fork Strategy)
- National and international partnerships and organisations

MSFD - Ecosystem-based management (EBM)



Holistic approach



Considers the entire ecosystem, including humans, when managing aquaculture activities



Goal: balance the needs of aquaculture production with the health and sustainability of the surrounding environment, keeping it in

- healthy
- non-toxic
- productive and
- resilient condition



Funded by
the European Union



Strategies



Acknowledging connections



Combined effects



Multiple objectives for food-production

Current aquaculture challenges covered by the Commission's strategic guidelines

Organic production

- The Farm to Fork strategy set the objective of significantly increasing organic aquaculture by 2030.
- The 2021 strategic guidelines include the promotion of the development of organic aquaculture in the list of issues to be addressed.

Algae production

- The Farm to Fork strategy indicates that algae should become an important source of alternative protein for a sustainable food system and global food security. The Commission communication on Blue Economy emphasises the potential of algae also as a source to produce chemicals and biofuels.
- The 2021 strategic guidelines make a number of references to algae and point to a separate and specific initiative, [launched in November 2022](#), to support the production, safe consumption and innovative use of algae.

Sustainable feed system

- Sustainable feed systems contribute to reducing the environmental and carbon footprint of aquaculture products. The 2021 strategic guidelines recognise the importance of ensuring sustainable feed systems, which includes limiting feed producers' reliance on fish meal and fish oil taken from wild stocks.

The European Parliament, in its [2022 resolution on striving for a sustainable and competitive EU aquaculture](#), reiterated the importance of these issues.

Union



Actions of the Farm to Fork Plan (within the Green Deal)



To assure an effective control system and evaluate compliance with EU standards.
(hygiene and contamination, animal welfare, plant health and pesticides, antibiotics ...)

for all European and imported goods from non-EU countries



To manage international relations

concerning food safety, animal health, animal welfare, animal nutrition and plant health



To manage collaboration with EFSA and ensure science-based risk management.

for various topics: <https://www.efsa.europa.eu/en/topics>



Implementation of the One Health approach – production sites



***Your input,
ideas, opinions?***



Group exercise



Funded by
the European Union

Fishbowl – Group exercise

 Put 3-5 seats in a circle or to the front, some participants who would like to start can take a seat.
➔ They build the fishbowl. (You can choose how many seats are filled at the beginning.)

 One chair must stay free the whole time.
If a person who sat in the “audience” wants to say or ask something/ give input/ etc. the person takes that seat and **another participant has to leave** the fishbowl to make room again.

 Speaking rules:

- ONLY people sitting on one of the fishbowl-chairs should be talking
– while the audience listens.
- Only one person speaks at a time. NO conversations on the side!
- ➔ If you want to add or say something; enter the fishbowl and take a seat!
- ➔ If a person enters the fishbowl, another person must voluntarily leave and clear a chair.

 Now together choose a topic, problem or an initial question that you want to discuss.
(Maybe some questions popped up during the presentation...)



Wicked Problems



Funded by
the European Union

“Wicked Problems”

-  are complex
-  interconnected
-  don't have yes-or-no answers
-  often generate unexpected consequences
-  are symptomatic to other problems
-  and unprecedented dilemmas and societal problems



What are your wicked problems?

Remember: One-Health – An Approach

*One-Health is about prevention,
responding to the true sites and origins of diseases
and reacting to larger (ecological) problems.*

*Due to the interdependence of everything,
the impact of (human) actions has far-reaching and often underestimated
effects.*

*Ecosystems are affected by human activity.
Don't forget that that in turn affects us.*

References

-  European Commission. One Health: https://health.ec.europa.eu/one-health/overview_en
-  European Commission. Aquaculture overview: https://oceans-and-fisheries.ec.europa.eu/ocean/blue-economy/aquaculture/overview-eu-aquaculture-fish-farming_en
-  European Commission. Sustainable fisheries: https://oceans-and-fisheries.ec.europa.eu/fisheries_en
-  European Commission: Facts and figures on the CFP <https://data.europa.eu/doi/10.2771/737237>
-  European Commission: RFMOs. https://oceans-and-fisheries.ec.europa.eu/fisheries/international-agreements/regional-fisheries-management-organisations-rfmos_en
-  European Commission: SFPAs. https://oceans-and-fisheries.ec.europa.eu/fisheries/international-agreements/sustainable-fisheries-partnership-agreements-sfpas_en
-  European Commission. Ecosystem-based Approach. <https://cinea.ec.europa.eu/system/files/2021-11/StudyonIntegratingEBAintoMSP-Guidance.pdf>
-  European Environment Agency: <https://www.eea.europa.eu/en/analysis/publications/healthy-seas-thriving-fisheries>
-  Seas at Risk, 2023: <https://seas-at-risk.org/wp-content/uploads/2023/07/The-State-of-Shipping-and-Oceans-Report-Final.pdf>
-  UNCTAD. Maritime Transport: <https://unctad.org/publication/review-maritime-transport-2024>

... and further information

- Article: How climate change relates to oceans – WWF, ... <https://www.worldwildlife.org/stories/how-climate-change-relates-to-oceans>
- Case study; policy brief: Evidence of multiple benefits and replicable methods from Algoa Bay, South Africa <https://oneoceanhub.org/wp-content/uploads/2021/11/Algoa-Bay-case-study-16.11.pdf>
- <https://oneoceanhub.org/wp-content/uploads/2021/10/Climate-change-and-ocean-policy-brief-FINALFINAL.pdf>
- Article: International legal requirements for environmental and socio-cultural assessments for large-scale industrial fisheries <https://onlinelibrary.wiley.com/doi/full/10.1111/reel.12462>
- Article: One Ocean, One Health https://www.researchgate.net/publication/225192049_One_Ocean_One_Health
- National Center for Environmental Information (NCEI): <https://www.ncei.noaa.gov/resources/education>
- Infographics & factsheets of the EC: https://food.ec.europa.eu/horizontal-topics/communication-outlets/infographics-factsheets_en
- European Atlas of the Seas:
https://ec.europa.eu/maritimeaffairs/atlas/maritime_atlas/#lang=EN;p=w;bkgd=1;theme=2:0.75;c=617910.1422549915,6661522.512668014;z=4 (interactive Online-Tool, EC 2023)
- European Commission. Food Safety: https://food.ec.europa.eu/index_en
- European Commission. Public Health: https://health.ec.europa.eu/index_en
- European Union. Summary of legislation on food safety and various health aspects
https://eurlex.europa.eu/summary/chapter/food_safety.html?root_default=SUM_1_CODED%3D30&locale=en
- Summary of legislation on food safety and various health aspects (food hygiene, animal health, plant health, statistics, alert systems, ...)
https://eurlex.europa.eu/summary/chapter/food_safety.html?root_default=SUM_1_CODED%3D30&locale=en



Thank you very much for your attention!

*Materials prepared by:
Ronja Hänsel
LVA
verein@lva.at*