Iceland Liechtenstein Norway grants

EIT Food Entrepreneurs

Co-funded by the European Union

AmpliAqua

The context behind our sustainable and healthy Aquaponics food production system

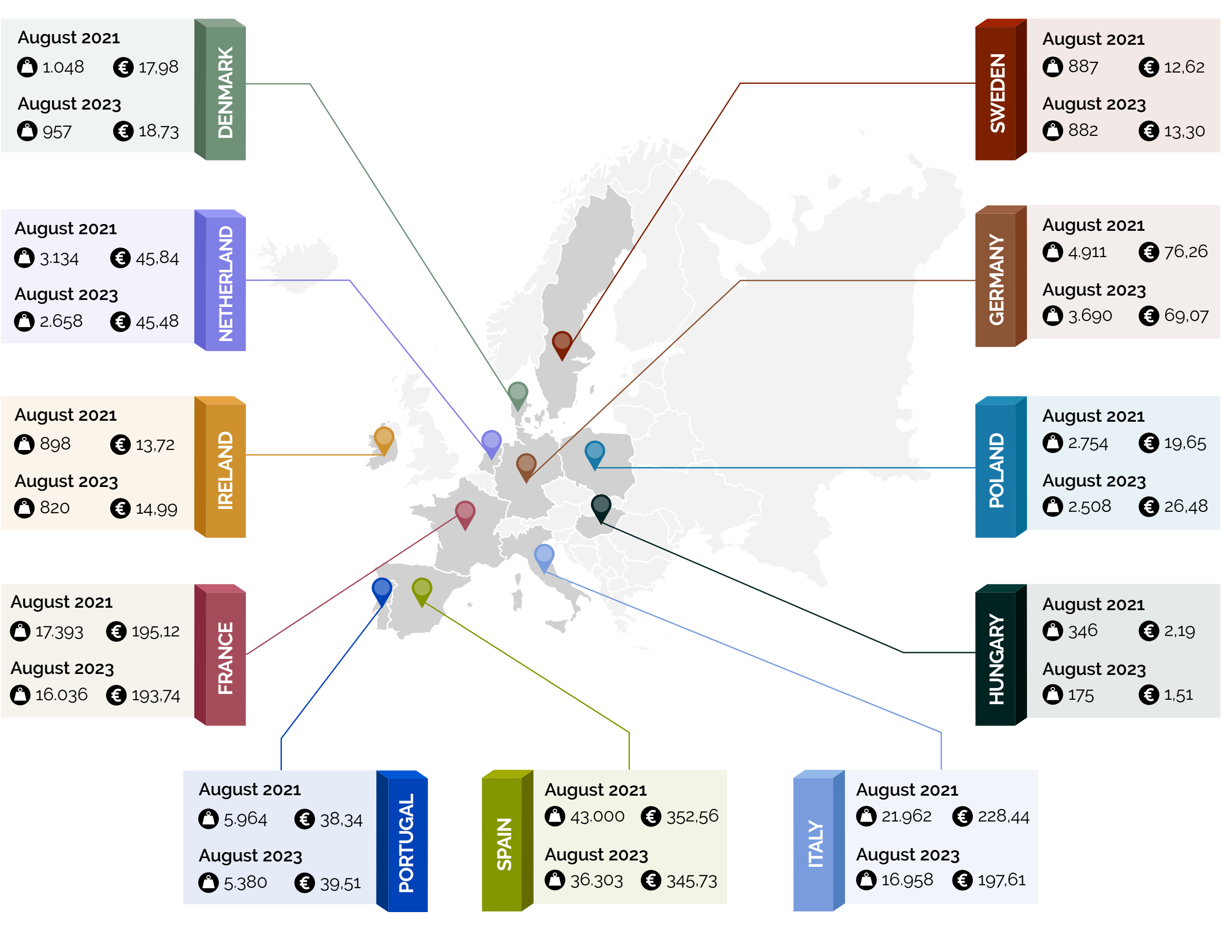
Fish Consumption Habits and Europe Context

Fisheries and aquaculture products are an important source of protein and a crucial component of a healthy diet.

24 Kg per capita
Is the EU average consumption of fish and seafood per year

3.3 kg
more than the global average

EU Consumption Variability



Overview of the household consumption of fresh fishery and aquaculture products in the reporting countries.

Source: European Commission, 2023

The rise of EU dependency on imports (2021)

12,500 thousand tonnes
Is the total supply of fish products for consumption in EU, including EU domestic supply and EU imports

72%
9,000 thousand tonnes
of the EU total supply are imports from third countries

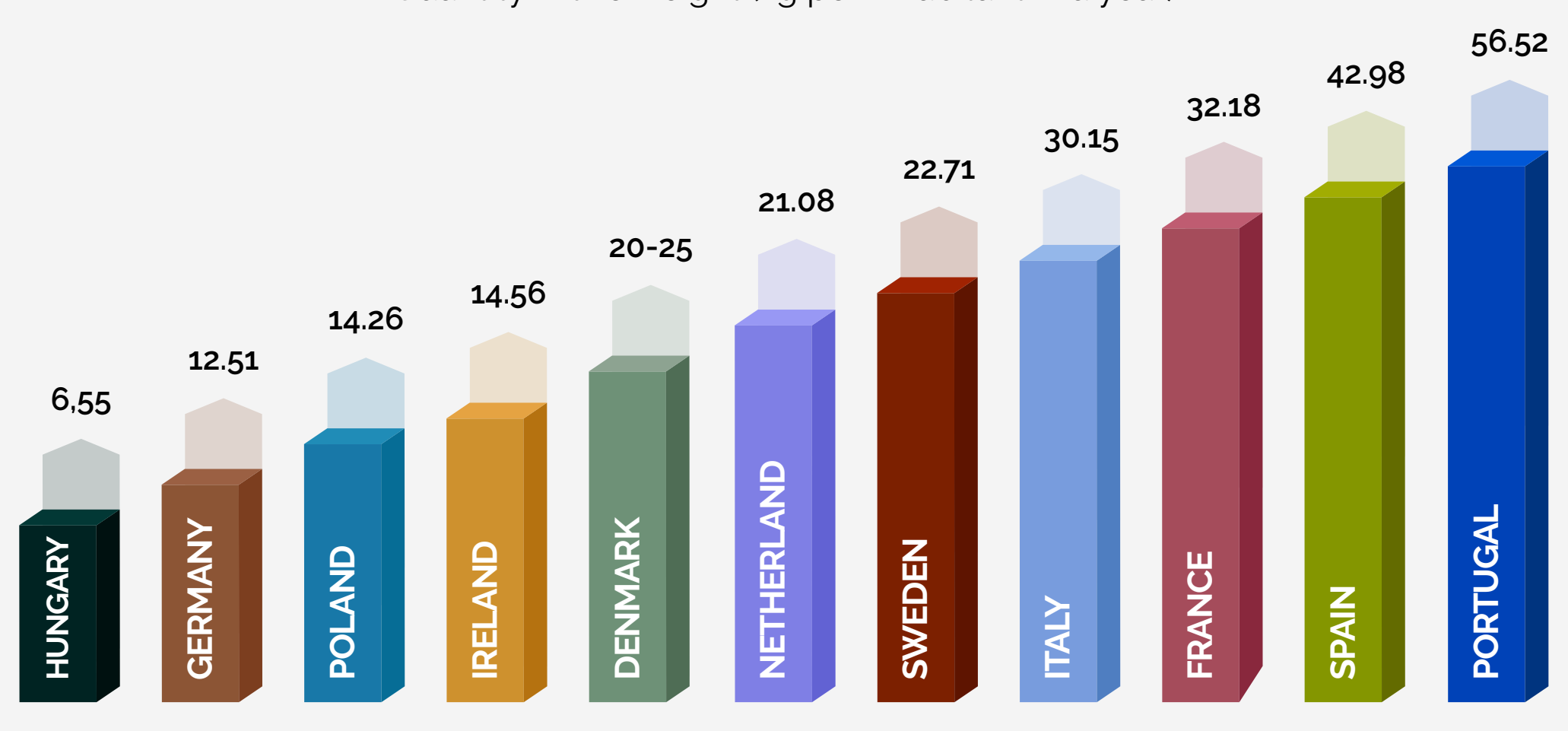
Source: Finfish Study 2022, AIPCE-CEP

Portugal's Seafood Preferences

Portugal boasts the **highest per capita consumption of fish and aquaculture products in Europe**. On a global scale, Portugal ranks third, being surpassed only by Iceland and Japan.

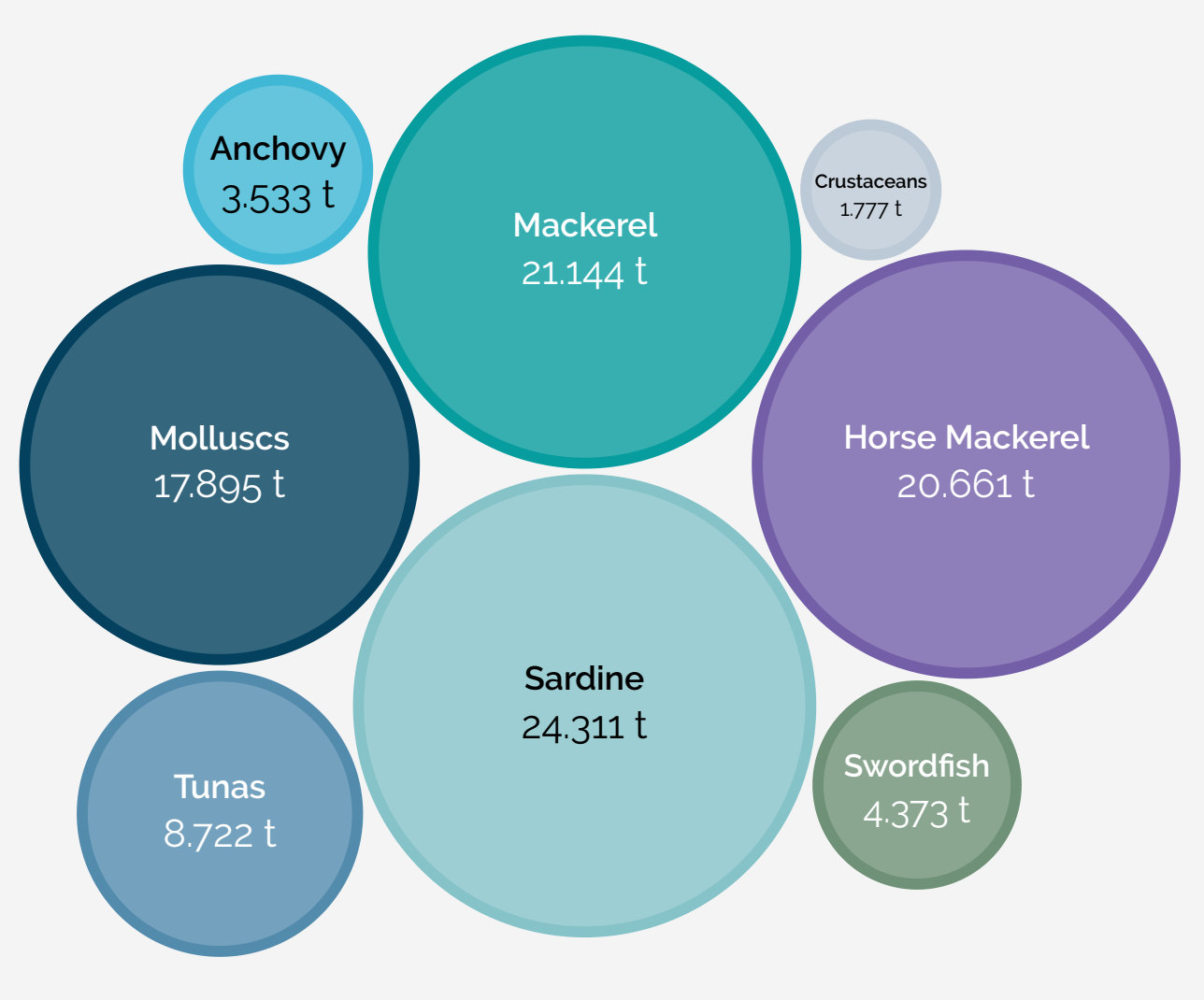
EU Consumption of Fisheries and Aquaculture Products (2021)

Quantity in live weight (kg per inhabitant in a year)



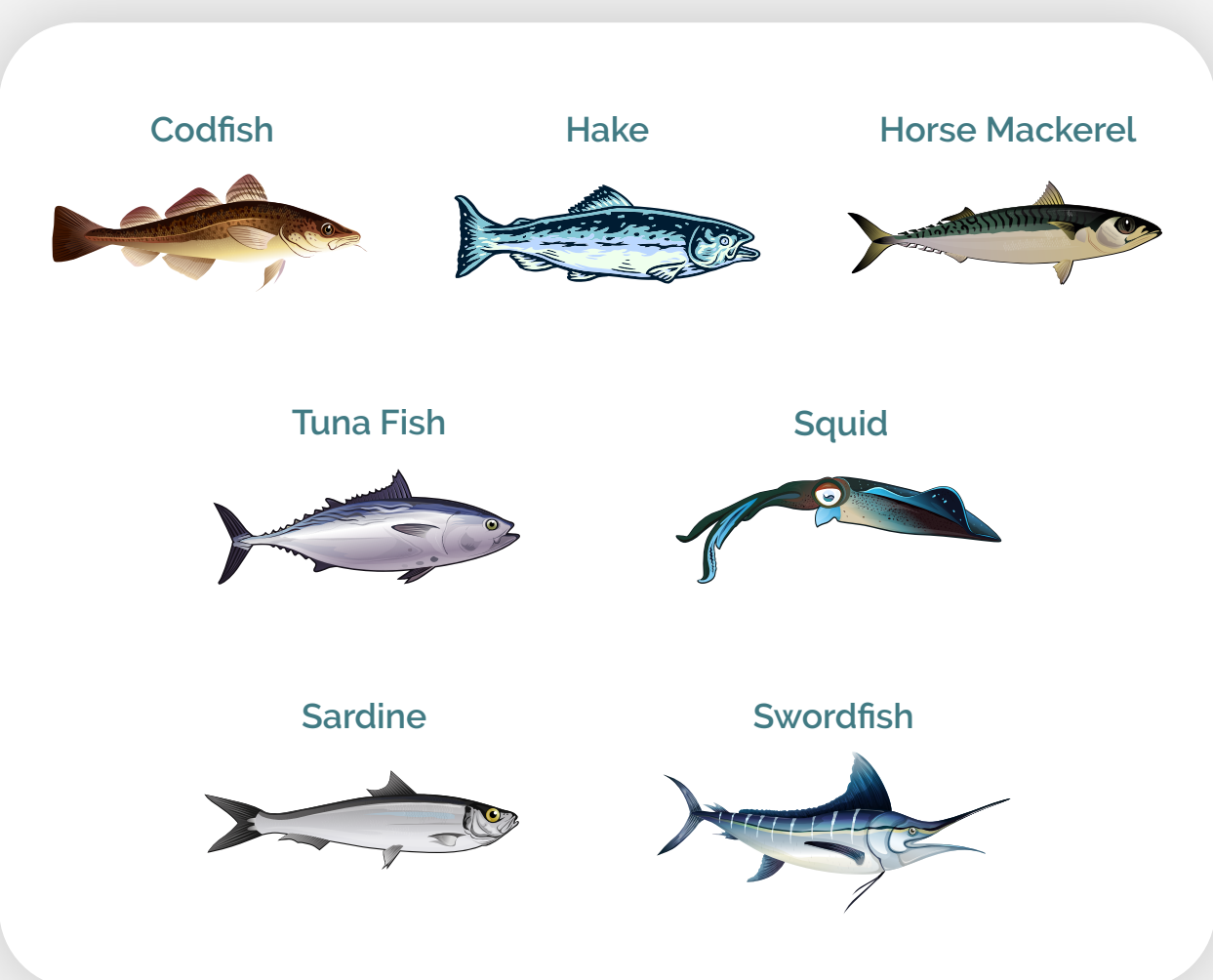
Source: European Commission, 2023

Portugal's Top 8 Captured Species in 2022 by Weight (tons)



Source: INE

Portugal's Most Consumed Species



Source: Expresso, 2017 ; CNN, 2022

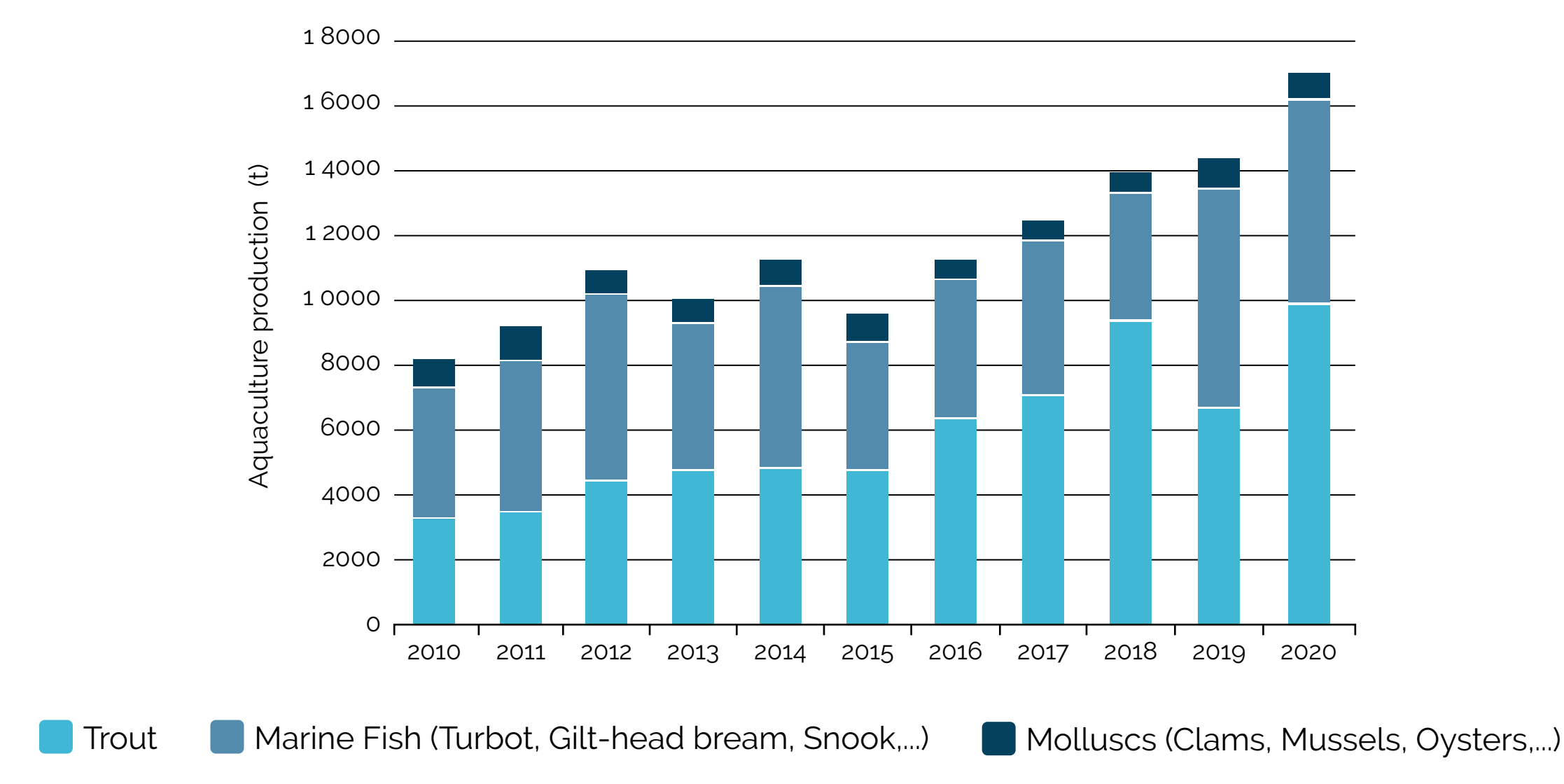
Aquaculture

Portugal's National Strategy for the Sea 2021-2030 identifies aquaculture as a crucial alternative to traditional fish supply.

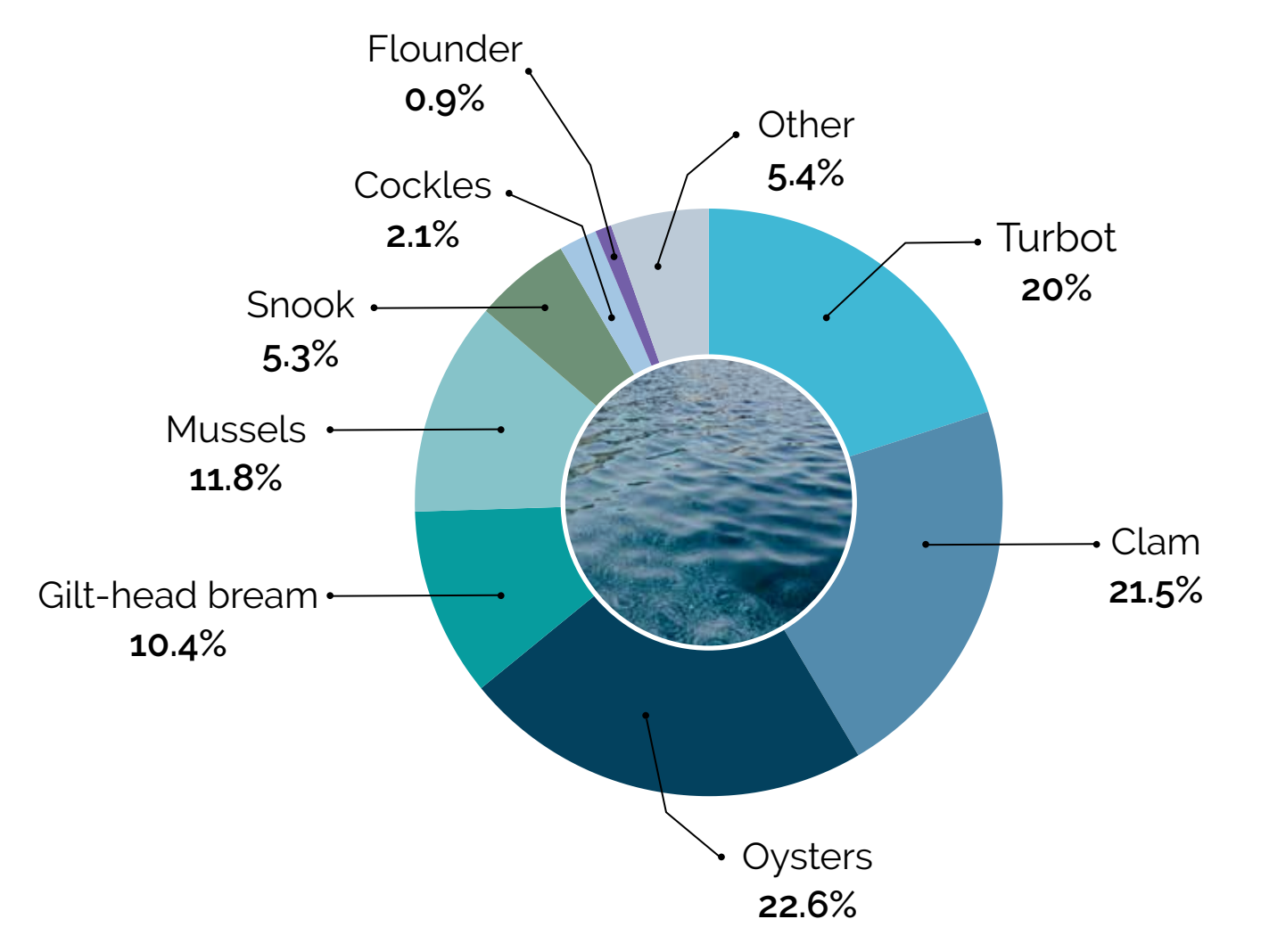
1.1 million tonnes
of aquatic organisms are produced in farms in Europe (2021)
Source: Eurostat

17.900 tonnes
of freshwater and marine fish, crustaceans and molluscs are produced in farms in Portugal (2021)
Source: Pordata

Evolution of Aquaculture Production in Portugal by Species (2010-20)



Portugal's Aquaculture Production in Transitional and Marine Waters in 2020



Source: INE/DGRM, 2022

There is a clear increase in the aquaculture production, mainly seafood, but it's important that it can be sustainable.

The Sustainability Issue

The vital role of aquaculture in responding to global demand is overshadowed by pollution from unsustainable fish farms, which harm coastal habitats.

Between 0.78 and 6.39 ± 2.33 cm3
microplastics per meter of beach can result from twisted rope, braided rope, and filament used in aquaculture. This may potentially emit between 300 and 1277 ± 431 microplastic fragments per meter of beach.

Source: Wu, Hou & Wang, 2023

14% of total debris
is caused by European aquaculture, according to estimates.

11,000 tonnes of waste and marine litter per year
are the result of fishing gear and aquaculture activities in European waters.

Source: From Pollution to Solution: A Global Assessment of Marine Litter and Plastic Pollution

Prediction of Aquaculture Growth in Europe (2010-2030)

Value Surge
Expected increase **2.7 billion euros**.

Volume Increase
Predicted to rise by **772,000 tonnes** (+56%).

Feed Demand
Projected to require an additional **395,000 tonnes**.

Source: European Parliament

With this growth, an urgent need for sustainable and equitable development strategies arises.

How Can We Make The Difference?

Aquaponics - the fusion of aquaculture and hydroponics - can create ecologically sustainable agrifood systems. Through this innovative technology, waste from farmed aquatic creatures nourishes hydroponically grown plants, simultaneously purifying the water.

Challenges Aquaponics Systems

Current limitations of Aquaponics and lack knowledge based services hinder progress of sustainable fish production.

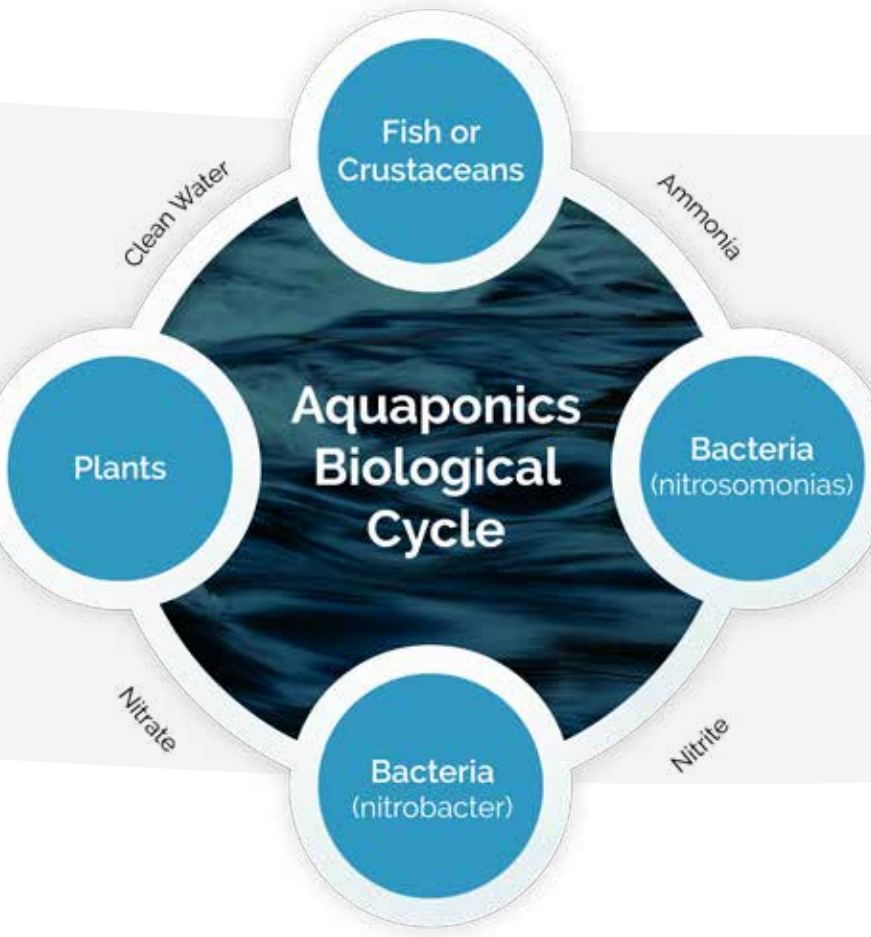
Existing Aquaponics system are inefficient:

- Different **water quality** demand of plants & fish;
- Use costly solutions for dealing with **off-flavour**;
- High volumes of **water use and nutrient loss**;
- Limited Integration of **digital tools.**

Lack of knowledge services focused on new generation of Aquaponic systems

How Does It Work?

Aquaponics blends freshwater aquaculture and hydroponics in a self-sustaining ecosystem. It utilizes a Recirculating Aquaculture System (RAS) for water, enabling soilless plant farming. A biofilter facilitates the conversion of fish waste into nitrates and nitrites by nitrifying bacteria.



Aquaponics Benefits

Water Efficiency
Aquaponics **uses less than 10% of the water** normally required for fish farming and plant production, making it suitable for areas with water scarcity.

Chemical-Free
There's no need for plant chemicals, ensuring the **safety of fish** and **reducing environmental impact**.

Food Security
Aquaponics provides a **sustainable way to produce protein foods** like fish and vegetables, benefiting both impoverished areas and regions with high demand for quality produce.

Increased Yield and Versatility:
Plants in aquaponic systems grow quicker, larger, and yield 15% more than those in regular hydroponic systems. The ability to locate systems almost anywhere **reduces distribution costs** and **carbon footprint for businesses**.

Source: FAO

Operator: Direção-Geral de Política do Mar

Promotor: BGI Sustainable Ventures

Partners: food for sustainability, aqualgae, International Development Norway, MOREFISH Fremtidens Akvakultur