

Seafish summary

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Key details

- While the population of Europe represents 12.6% of global population, the region accounts for 14.5% of the world consumption of fish and fishery products.
- The European Union (EU-27) market is far from being a homogeneous one. Only six Member States (Spain, France, Italy, Germany, UK and Portugal) account for 85 percent of the total expenditure on fish products.
- Southern European countries show the highest per capita consumption level; countries in Northern Europe show average levels (around 20 kg/year per capita) and those in Central and
- Eastern Europe show levels varying between 3 and 16 kg/year per capita, which are well below average.
- With the exception of the Faroe Islands, Norway, Malta and Greece, aquaculture remains an activity with a marginal contribution to national economies and employment.
- The total employment in the aquaculture of the region is currently estimated at around 150 000 full time equivalents, which is small, but may contribute locally to significant economic and employment activities (mollusc culture for instance).
- Extensive and semi-intensive systems (pond culture and shellfish farming) employ more people per unit production than modern intensive (and generally automated) systems.
- Between 1990 and 2008, the production volume of European aquaculture increased by 55.3 percent, from 1,622,000 tonnes to 2,518,000 tonnes, while the production value doubled, from US\$4.076 million to US\$ 9.390 million. The increase was mainly attributable to the growth of marine finfish aquaculture, while freshwater aquaculture production declined. However, the overall production volume has shown only a moderate increase between 2002 and 2008 (+18.4 percent).
- European finfish culture is dominated by salmonids, sea bass, sea bream and common carp, but significant growth has come from higher-value fish species, particularly turbot and tuna. Cyprinids are the dominant species farmed in the Central and Eastern European region.
- The 2008 mollusc aquaculture production of 658,000 tonnes, contributed to 26% of the volume of the total European aquaculture production (16.6% value). The production showed a steady increase to reach a maximum output at the end of the 1990s, thereafter showing a decreasing trend.
- Mussel culture represents 71% of total molluscs produced in the region, followed by oysters (19.9%). The remaining is composed of clams, carpetshells and cockles, with a very small production of scallops.
- The main producing countries are Spain, France and Italy, but other countries show some increasing production trends, notably in other Mediterranean countries such as Greece and in Northern Europe, in Norway.
- With stagnating aquaculture production, the European market is increasingly dependent upon imports. Some 1.65 million tonnes (live weight equivalent) of farmed seafood products were imported into Europe in 2008. Almost half of this is salmon, although imports of pangasius catfish and tilapia from Southeast Asia have demonstrated remarkable growth in recent years. France and Italy are the biggest net importers in the EU, while Denmark and Greece are the biggest exporters.

- Exports from the EU totalled only 100,000 tonnes in 2008 and included mainly high-value processed products.
- The United States of America and the Russian Federation were the two largest importing countries of EU production.
- Harvest and post harvest services are significant components of the aquaculture industry in Europe and more than 135,000 people are estimated to be employed in fish processing in the EU.

External factors likely to impact the competitiveness and long-term sustainability of the future development of European aquaculture:

- Increasing competition for resources with other economic activities (urbanization, agriculture, industry, tourism, nature protection etc.) is probably the major challenge for the further development of European aquaculture and access to suitable sites for aquaculture production is a critical issue.
- Environmental legislation is also seen as a burden, especially concerning the widely varying needs of Environmental Impact Assessments across European Union member countries.
- Environmental factors (climate change and changing weather patterns, fish disease issues, changes in natural seed stock availability and industrial or other pollution effects); variations in inputs to the sector (wild seed stock, fishmeal and oil supplies, shellfish and other seed stock availability, energy costs, labour costs, etc.);
- Trade (changes to trade policy and tariffs).
- Government policy (regulatory frameworks).
- Financial factors (investments, exchange and interest rates, taxation levels, insurance assessments and premiums).
- Competitive factors (new species, new product forms, new producers); global and regional economic crises (changes in consumer preferences and purchasing power).
- Spatial planning, particularly in the maritime realm, is being encouraged across all European countries as a tool to assess the development potential of aquaculture.
- Variations in inputs to the sector, trade, government policy, financial and competitive factors, as well as global and regional economic crises.
- With imports of aquaculture products (mainly from Southeast Asia) seeming at least to remain at their current levels (and probably increase further as demand increases), global climate change and their effect on trade issues will have a high impact on the European sector.
- European shellfish culture is reliant on natural productivity and pond-based finfish aquaculture, mainly in Central and Eastern Europe, and is based on stimulating natural food production through the addition of inorganic and organic fertilisers. However, the species mix of salmonids, seabass, seabream and other mainly piscivorous fish in European production has given rise to questions on the sustainability of using fishmeal and fish oil in aquafeeds. If the capture of non-food fish does not increase in coming years, then the availability of fishmeal and oils would not allow the projected increase of the world aquaculture production and certainly not in European production with the current species mix. To add to this, certain voices are questioning the use of this resource, arguing that a large part of this resource should be better used for direct human consumption, to maintain the per capita ratio of wild fish in the diet. European research focus and industry initiatives over the last decade have resulted in a decrease of 50% or more in the share of fishmeal in fish feeds. While the focus has been on plant protein sources, their market prices have not always provided justification and the EU ban on processed animal proteins in feeds has not facilitated the issue. Similar

efforts are under way to reduce the use of the total fish oil use through replacement, but also through phase-feeding practices, using appropriate mixtures of plant oils for certain parts of the growing cycle, then switching to finishing feeds rich in fish oil to raise the levels of long-chain omega-3 polyunsaturated fatty acids to ensure the nutritional value of the fish to consumers.

- Although native species represent the major share of aquaculture production in the European zone, introduced species account for a non-negligible part, endangering indigenous biodiversity.
- Fish health management is an integral part of aquaculture husbandry and significant efforts have been made to prevent diseases and reduce the use of medication. Appropriate aquatic animal health service systems are available in most European countries.

The way forward

- The responsible use of resources and the protection of the environment will remain key challenges in the future development of aquaculture technology and systems. Thus, the wider exploitation of inland and coastal waters for aquaculture in many cases might be increasingly constrained by growing competition from other resource users as well as by regulatory restrictions, unless new aquaculture technologies, such as offshore systems and inland recirculating aquaculture systems, are adopted.
- At the EU level, the main regulatory and legal constraints appear to be a lack of any common approach to licensing; concerns about the Water Framework Directive's potential to constrain the development of aquaculture; interpretation of legislation concerning the predation of aquaculture stocks by protected species, and the application of environmental impact assessment rules at the local level.
- While specific data collection for aquaculture and fishery products is now covered by European regulations, several initiatives have been made to assess financial indicators and the feasibility and cost of collection.
- The global environment is changing and maybe even more rapidly than previously assessed. Global warming may significantly affect aquatic ecosystems and species distribution. A change of one or two degrees in coastal water temperature will modify the scope of European aquaculture activity, with a northward trend and potential changes in the species farmed.
- The future success of the modern, professional European aquaculture sector may increasingly be dependent on the availability of high-quality services in seed and feed supply and also in veterinary support and services.
- New aquaculture technologies, such as offshore systems, recirculating aquaculture systems or integrated production systems provide opportunities for development, although these are unlikely to represent the majority of European production systems in the next decade.
- There is no single indicator to prove or demonstrate the improvements observed in aquaculture practices over the last decade, and no single reference point against which this can be measured. The efforts made by the production sector are indeed significant, but the average European citizen, keen to consume healthier seafood, is not aware of these and has a somewhat *a priori* negative image of aquaculture, often due to ignorance of whether the product bought is actually farmed or lack of access to balanced information about how it is produced. This sometimes negative public perception is also observed by some policy makers and non-experts.
- The European Commission has been called upon by the Parliament and by the sector to move forward the development of an "ecolabel" that can certify environmentally friendly

aquaculture practices in Europe and this, or another, similar labeling system could help to improve the image of the sector.

- Finally, the last decade has seen significant advances in the interrelations between European organizations involved in aquaculture and most notably in initiatives that have sought to involve consumer organizations, both at European and national level. Aquaculture products face stiff competition with beef, pork and poultry, although the sector has grown the most over the last decade. Better communication within the value chain and towards consumers will be of high importance in a seafood sector where European products fill a relatively high-priced niche position compared to other aquaculture products and other animal protein sources.

FIGURES

Volumes and species

- The most recent available data (2008; see Figure 7) also show that the majority of aquaculture products, about 75%, derive from marine aquaculture (FAO, 2010).
- Between 1990 and 2008, freshwater aquaculture production dropped from about 729,500 tonnes to 540,900 tonnes. In comparison, marine aquaculture increased from 807,000 tonnes to 1,884,000 tonnes, including fish, molluscs and aquatic plants.
- At the same time, brackishwater production more or less stagnated (increasing from about 85, 000 tonnes to 93,000 tonnes).
- The total production of aquaculture showed a moderate increase between 2002 and 2008 of some 18.4% (from 2,127,681 tonnes to 2,518,614 tonnes). However, this is not reflected evenly across all the main aquaculture subsectors and in all countries.
- Production of marine finfish species (notably, salmon, as well as seabass and seabream in some Mediterranean countries) continued to increase in general (with some annual variations), while a general stagnation was observed in the production of a number of freshwater finfish species and shellfish, which make up about half of the total volume of production.

Countries

- Ninety percent of the production originates from the top twelve countries.
- Aquaculture production in Norway leads the region, accounting for 33.5% of the production by volume (National Veterinary Institute of Norway, 2009) and value.
- Although Spain ranks second in production volume, its ranking in value slips to the sixth place because of the lower value of mussels compared with finfish.
- Among the top producing countries, Norway has had by far the greatest impact on aquaculture development in the region. This success was principally attributable to increases in production and productivity of Atlantic salmon aquaculture in the 1990s and driven by significant improvements in feed production, improved technologies and farm management, genetic selection and bio-security (Rana, 2007).
- These overall regional figures, however, hide significant differences between Western and Central and Eastern Europe. While production in Western Europe increased from about 1,127, 000 tonnes to 2,251,000 tonnes during the period, in Eastern Europe it fell from 495,000 tonnes to 267,000 tonnes, mainly as a result of the turbulent economic period of the early nineties.
- The dominant aquaculture industry in Europe is marine aquaculture, which showed a gradual increase in the past fifteen years, although the rate of development has slowed down and production has stagnated in the past few years. Freshwater aquaculture production, which dominates in CEE, is levelling off in both CEE and Western Europe. The share of Western European aquaculture production relative to the total European aquaculture production was about 89% in volume and 92% in value in 2008.

- Marine and brackishwater aquaculture production in Central and Eastern Europe was only 10, 558 tonnes in 2008, which is negligible when compared to Western Europe where the marine and brackishwater aquaculture production was 1,967,172 tonnes. However, freshwater aquaculture production was 256,856 tonnes in CEE countries in 2008, which is about 47.5% of the total freshwater aquaculture production in Europe.

Species

- In 2008, the production data of over 120 species were reported to FAO and recorded in Fishstat Plus, which shows the high diversity of European aquaculture.
- Although European fish culture continues to be dominated by salmonids, seabass, seabream and common carp, the most notable growth rates in production over the past five years have come from fish species with higher unit value, particularly turbot and tuna.
- Eel aquaculture has also achieved significant growth but it has been observed to have a relatively low market saturation level, which it is unlikely to breach. Some producers have also targeted the lower value but higher volume market segment with species such as cod and catfish.
- Although the volume of freshwater fish production is almost equal in Western Europe (284,000 tonnes) and Central and Eastern Europe (256,800 tonnes), cyprinids are the dominant species in the CEE region contributing 75% of the total freshwater aquaculture production, while the share of trout is 68% of the total freshwater aquaculture production in Western Europe.
- In terms of volume, Atlantic salmon was the most important species (36.6%), followed by rainbow trout (11.7%), sea mussel (7.2%), blue mussel (6.8%) and common carp (6%). Common carp is the most important contributor to freshwater fish species aquaculture. Salmon and trouts account for 51.1% of total volume produced, with Atlantic salmon alone representing more than one third.
- Marine fish have seen a significant increase over the last 10 years, the two leading species seabream and seabass contributing now for 7.4% of total production.
- The major shellfish produced contribute to 27%, dominated by mussels farmed in Atlantic and Mediterranean waters (19.6%).

Value and markets

- In terms of value in 2008, the most important is the farming of Atlantic salmon (40.8% of the total), followed by rainbow trout (11.6%), gilthead seabream (7.1%), European seabass (5.0%) and common carp (4.5%).
- The most important increases in aquaculture production have been in fish species with higher unit value, largely dominated by seabass, seabream, and Atlantic salmon.
- Mollusc production has remained fairly constant for the last ten years, dominated by mussels and oysters.
- The most important producers of common carp in 2008 were the Russian Federation, the Czech Republic, Poland, Ukraine, Germany, Hungary, Israel Serbia and France, which produce close to 90% of the European common carp production.
- The major European producers of trout in 2008 were Norway, Italy, France, Denmark, Germany, Spain, Poland and United Kingdom, with a 84% share in the total EU volume.
- The most important producers of mussels are Spain, France, Italy, the Netherlands and the United Kingdom, with an 82% share in the total European volume.
- Most of the Atlantic salmon production is concentrated in Norway (80.6% in 2008) followed by the United Kingdom (almost 14%) and Faroe Islands (4.2%) and the rest in Ireland (1.1%), with marginal production volumes in France (0.12%) and Iceland (0.03%).

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- The production of Gilthead seabream and European seabass is dominated by Greece (46.6%) followed by Spain and Turkey with 17% each. Italy, France, Croatia, Portugal and Cyprus are other countries having significant production.
- Looking at the trends of individual species, it appears that the only species with a consistent growth in value and volume are salmon, seabass and seabream, although the produced volumes of these two latter species are much lower, as well as the respective growth rate of the volumes produced.

The report can be found at:

<http://www.fao.org/docrep/014/i2211b/i2211b.pdf>