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CERES storyline - sea bream and seabass in the S Atlantic and W Mediterranean

What do we know about about sea bream and seabass?

Gilthead sea bream (*Sparus aurata*) and European seabass (*Dicentrarchus labrax*) are the main species currently farmed on a large scale in South Europe. They are common throughout the Mediterranean and are also found along the Eastern Atlantic coasts, from the United Kingdom to the Canary Islands (*sea bream*) or from Norway to Senegal (*seabass*). Traditionally, sea bream and seabass have been farmed extensively in coastal lagoons and brackish ponds of northern Italy and in southern Spain and Portugal. In the 1980s it was successfully reproduced in captivity and intensive rearing systems (especially sea cages or land-based tanks) were developed. Since then sea bream and seabass have become two of the main products of South European aquaculture. In coastal lagoons, sea bream are generally reared with mullet, seabass, bream and eels. On average, sea bream reach commercial size after one and a half years, whereas seabass is generally harvested when they weigh 300 g to 500 g, which takes from 1.5 years to 2 years, depending on water temperature.

Our goal in CERES is to determine the potential impact of climate change, not only on sea bream and seabass production, but also on growth, recruitment, and natural mortality. Of particular interest is to identify which environmental factor was the key driver behind this change.

How vulnerable are sea bream and seabass?

The sea bream and seabass industries are sectors already entering its mature phase, but still needing more efficient production systems and new technologies. The most relevant barriers and challenges affecting the growth of this sector are:

- increased competition for space in coastal areas
- availability of protein sources and feed prices
- climate change direct and indirect effect on the production
- increased requirements for sustainability in farming practices
- diseases management
- transfer of diseases and parasites between farmed and wild fish
- farmed fish escapes
- unregulated supply and demand causing imbalance in the market and reduced profitability
- predominance of small-scale farmers
- lack of co-operation amongst local and international producers, and between government and industry on R&D
- lack of product differentiation and development
- lack of co-ordinated national strategic plan for aquaculture and poor industry administration
- competition from an emerging range of other farmed species.
- industry rationalisation and scope for development of efficient production systems
- need to develop quality schemes, branding strategies and better promotional tactics
- consumer's growing interest for safe and healthy food

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What is the economic value of this species?

Most sea bream and seabass are produced by aquaculture. The EU is by far the biggest producer worldwide (67% for sea bream and 80% for seabass), followed by Turkey (sea bream) and Egypt (seabass). Within the EU, Greece is the largest sea bream and seabass producer, followed by Spain (see Figures 1 and 2). Trade between the EU and third countries is very limited. On the other hand, intra-EU trade is substantial, Greece being the major sea bream exporter towards Italy, Portugal, France and Spain. In contrast, for seabass, Greece is the main exporter and Italy, United Kingdom, France, Spain and Portugal are the main importers of this species. The annual sea bream production reaches around 370 million euros in the EU (i.e. 73k tons), whereas the seabass production reaches around 370 million euros in the EU (i.e. 68k tons) (data from 2011). Climate related change is expected to affect production yields may pose a serious threat to the viability of this aquaculture sector.

What are the challenges?

Further development on sea bream and seabass aquaculture requires that knowledge gaps are covered in the future:

» A cost-efficient production and a high efficiency of operations are the most important challenges currently experienced. These may be met by intensification, automation and up scaling of the production. This requires well developed operational routines, accurate measuring real time systems for monitoring of the enclosed biomass and contaminants, and reliable control mechanisms.

» The growing awareness for seafood safety, ethics and welfare pushes forward the need for production systems that safeguard animal optimal condition and that take sufficiently care about the preservation of the surrounding environment. In intensive mariculture, good water quality, responsible handling routines and minimisation of escapes are important objectives towards a sustainable production. This may be achieved by improved containment systems.

» Technology to advance the safety on aquaculture platforms and a further automation of high-risk operations may contribute to make the profession more appealing.

» The gradual movement of production units towards more exposed areas has been initiated through the search for locations with more stable environmental conditions and less conflict with other coastal activities. New challenges in comparison to mariculture in sheltered areas are the development of more robust equipment as well as a larger degree of automation for operations such as feeding and maintenance.

» Projecting the impact of climate change on sea bream and seabass production based on current available and disperse data is expected to be accompanied by a great deal of uncertainty, thus higher data collection is needed to assess the direct and indirect effects of climate changes on these species, integrating with real-time environmental monitoring tools.

» Finding sustainable and efficient alternatives to reduce dependency on wild stock for farmed fish feed production.

What is the working program in CERES?

- Experiments about acidification and jellyfish exposure impact on sea bream and seabass
- Impact of toxic algal exposure on farmed sea bream under warming and acidification
- Impact of vibriosis on farmed sea bream under warming and acidification
- Combined effect of temperature and food on growth, survival and stress biomarkers of farmed sea bream juveniles.
- Sampling & data collection strategy for farm economic datasets using the „typical farm approach". Farm surveys and data collection from seabass / seabream farms will be used to reflect the prevailing production system with common technology, capital input, labour resources and typical production volume within W Mediterranean/S Atlantic areas.

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