

SEAentia

SEAentia is a start-up based in Portugal, founded by four academics in September 2017. Their main objective is to produce high-quality, sustainable, healthy seafood for the human population. SEAentia aims to become a leader in producing Meagre (*Argyrosomus regius*), known as Corvina in Portugal, from hatchery to commercial size, using a Recirculating Aquaculture System (RAS). Their long-term goal is to establish themselves as a global reference in the aquaculture industry by exploring new commercially relevant fish species with good consumer acceptance and setting up new farms worldwide. The pilot system currently serves as a research and development centre where numerous ongoing projects are being conducted in partnership with well-known national and international collaborators.

Peniche



Regional Context

Portugal has a strong connection with the ocean and the seafood industry. The coastal regions of Portugal are important centres for fishing, as they provide easy access to high-quality marine water and are close to fish industry stakeholders. Peniche, a fishing community one hour north of Lisbon, is significantly involved in Portugal's blue bioeconomy. This area is well-known for its abundant marine resources and long-standing fishing traditions, which make it an ideal location for innovative aquaculture projects like SEAentia.

Peniche's strategic location provides access to rich marine biodiversity and proximity to significant research and development centres, which positions it well for pioneering efforts in sustainable fish farming. The presence of forward-thinking companies like SEAentia in Peniche contributes to the area's reputation as a hub for blue bioeconomic development, emphasising environmentally sustainable and economically viable marine activities.

Value Chain

As mentioned, SEAentia has important plans to establish a large-scale production of Mea-

gre (Corvina) in RAS. RAS is an expensive land-based technology that offers significant advantages for sustainable fish farming. This technology allows SEAentia to use marine water directly from the ocean, which is treated to remove contaminants, microplastics, and heavy metals, ensuring optimal water conditions for fish health. Despite its artificial nature, the system maintains the highest water quality to promote the best animal welfare. The technology ensures optimal feed utilisation, reduces waste production, and eliminates the need for chemicals to maintain water quality.¹

Based on scientific research, SEAentia has developed a RAS approach to enhance fish performance that contributes to developing adequate growth models and feeds. Not only does this production method ensure biosecurity through physical and biological filters, but it also favours environmental protection by minimising waste, avoiding antibiotics, and ensuring optimal animal welfare. The RAS system also provides an enriched environment for the fish, including objects for interaction and controlled lighting conditions to suit the species' natural preferences.

The company also seeks to mitigate stress factors, such as light intensity and photoperiod, ensuring the fish are not subjected to uncomfortable conditions they cannot escape, unlike in open ocean cages. Understanding the biology of Meagre is critical to this process, allowing SEAentia to fine-tune the sys-

1 SEAentia, [Why RAS?](#). Accessed 29 January 2024.



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SEAentia contributes to valorising products and by-products from the fish value chain.

tem for optimal fish welfare. The company regularly monitors bioindicators of stress to ensure the fish are thriving.

SEAentia's choice of Meagre was strategic, as it is an emergent saltwater species in fish farming, known for its large size and rapid growth under optimal conditions, and highly appreciated by consumers due to its superior taste and versatility in cooking. Additionally, Meagre has a high content of omega-3 fatty acids despite its low-fat content, making it nutritionally beneficial.²

As pioneers in applying RAS technology to Meagre, SEAentia navigates uncharted territory. Because of the high cost of the technology and novelty of the project, the founders had to start from a pilot-scale RAS pilot project dedicated to collecting valuable data on the species' response and performance in such systems. This had to be done to test the technological limits of the system and was a crucial ground block to ensure the success of future operations. Currently, the pilot system is used as an R&D facility where several ongoing projects are being conducted in collaboration with renowned national and international partners.

Furthermore, SEAentia collaborates with Clean Valley CIC to harness the nutrient-rich

2 SEAentia, [Why Meagre?](#). Accessed 29 January 2024.



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wastewater from SEAentia's fish farming operations to cultivate microalgae and oysters, effectively transforming waste into valuable biomass. This innovative approach valorises every stage of their production process and contributes to developing sustainable aquaculture technologies.³ The initiative showcases how SEAentia's operations can attract and enable other companies to engage in eco-friendly projects, reinforcing a circular philosophy in the aquaculture industry. This symbiotic relationship highlights SEAentia's role in fostering an ecosystem of sustainable practices, where waste is minimised, and by-products are efficiently utilised for additional production, reflecting a shift towards more sustainable and integrated aquaculture systems.

SEAentia's founders have been awarded various prestigious awards for their forward-thinking approach, bolstering their credibility and attracting investors' attention.

³ Entrevestor, [Clean Valley Extends European Trial](#). Accessed 29 January 2024.

In 2020, they were honoured with the [PwC Blue Revelation Diploma for Entrepreneurship](#), recognising their contributions to the blue economy. Additionally, SEAentia won the [BlueBioValue](#), a start-up acceleration programme, in 2018, further affirming their innovative efforts in aquaculture. Their project was also selected by the European Commission for the Blue Invest program as a success case in Europe.⁴ Lastly, the company also won the Pitch Competition at the 2nd [Digital with Purpose \(DWP\) Global Summit](#). The competition strives to recognise and support innovative projects that harness digital technologies to address sustainability challenges. This event offered 16 startups an opportunity to showcase their ideas and receive recognition for their efforts. As the winner, SEAentia was awarded a monetary award of €5,000, intended to help advance their development.⁵

⁴ European Commission, Oceans and Fisheries, [SEAentia-Food: Growing with BlueInvest](#). Accessed 29 January 2024.

⁵ Startup Portugal, [Digital With Purpose Global Summit 2023](#). Accessed 5 April 2024.



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João Rito, General Manager of SEAentia, receiving the Pitch Competition prize at the 2nd DWP Global Summit.

Regional and Local Enabling Conditions

Peniche's high-quality marine water makes it an ideal setting for SEAentia's RAS operations and production. The region's minimal riverine pollution and lack of major estuaries ensure that the ocean water is clean and unpolluted, a critical factor in the region's reputation for producing some of the best seafood in the world.

Furthermore, the local administration in Peniche has significantly supported SEAentia's efforts in the region, providing a supportive environment for growth. Recognising the economic potential of the blue economy, the municipality actively facilitates the establishment of new businesses in the area. This administrative support is also complemented by access to a network of stakeholders supporting blue economy initiatives. Peniche's status as Portugal's primary seafood hub also offers SEAentia invaluable industry connections. The region's well-established fish industry, encompassing everything from catches and processing to distribution, presents SEAentia

with crucial channels for collaboration, marketing, and distribution of its products. Moreover, being located in an economically disadvantaged region, SEAentia can access higher funding rates for European projects, a strategic advantage that supports the development of the area's aquaculture sector.

Lastly, SEAentia's proximity to educational institutions like the [School of Tourism and Maritime Technology](#) of the Polytechnic Institute of Leiria in Peniche enriches its operations with academic collaborations. Partnerships with educational institutions are essential for a start-up in a highly specialised field like aquaculture.



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Visit by the "Semana Tanto Mar" Summer Academy to the SEAentia facilities.

They provide access to research, skilled labour, and resources. SEAentia values the ability to seek quick assistance from researchers on issues like disease analysis in fish, which is invaluable. The academic community also benefits from these relationships as practical experiences are provided for students to enrich their learning.

Impact on Regional Development

SEAentia is expanding its operations in Peniche, which is anticipated to impact regional

development significantly. While the direct job creation may be moderate, with an estimated 30 to 50 positions, the broader economic effects are expected to be substantial. This is due to the company's use of advanced automation and technology, which will enable them to become the first to commercially produce Meagre through RAS. This pioneering status is expected to draw industry professionals, researchers, and educational institutions to the region, seeking to learn from SEAentia's innovative practices.

The production of SEAentia will not only bring direct benefits to the local economy but also stimulate growth in related sectors, such as fish processing and distribution. As the company does not plan to include processing as part of its operations, local processing companies that currently do not process Meagre will expand their operations and workforce in response to SEAentia's expanded production. This will lead to a significant increase in indirect job creation, providing a substantial boost to the local job market. Additionally, this phenomenon might offer the opportunity to absorb a workforce segment, such as local fishermen, within the aquaculture industry, particularly in processing tasks like fish filleting. This transition will not only provide new employment avenues for the traditional fishing community but also integrate them into a more sustainable and technologically advanced sector, thereby contributing to the socio-economic evolution of Peniche. SEAentia's success in Peniche can significantly raise the municipality's profile, attracting attention and investment to the area. This can lead to further development and growth opportunities in the aquaculture sector and across the broader local economy.

All of the above is bound to have a positive

ripple effect on Peniche's regional development. The impact will likely involve not only the creation of direct and indirect job opportunities but also the creation of new local businesses and the attraction of global investors and aquaculture specialists. SEAentia's unwavering focus on sustainability and innovative practices will position Peniche as a critical player in the aquaculture industry.



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