European Aquaculture
Technology and Innovation Platform

Input to open consultation: Testing and demonstrating systemic innovations for sustainable food from farm to fork

The call opens for an innovation action that is addressing urgent key issues in achieving the necessary food system transition. The engagement and commitment of the industry is paramount to its success. However, investments are being put on a hold because of highly unpredictable licensing regimes. Moreover, authorities across Europe use different indicators and standards. This absence of a legal level-playing field for the allocation of aquaculture licenses is a serious obstruction to reach the anticipated sustainable growth and self-sufficiency of seafood. High priority needs therefore to be given to a demonstration action that can challenge existing aquaculture regulations as to ensure a predictable, science and evidence based licensing system.

The application of a system thinking approach is supported. Value chains in aquaculture are long and complex with a multitude of input factors and services, depending on the requirements of the produced species, the production system and the regional conditions. The components of this value chain are highly interconnected and improvements in one part will have a large impact on the final product, whether it is related to economic value, carbon footprint or product quality. This high complexity requires technologies and competence from a wide spectrum of disciplines, industry branches and business innovation favouring cross sector potential.

European Technology Platforms are industry-led stakeholder forums and key actors in driving innovation, knowledge transfer and European competitiveness. Through the promotion of more open models of innovation and knowledge sharing across European regions, the innovation capacity of the sector will be strengthened. Demonstrating the role of industry-driven multi-stakeholder clusters, on a regional and a European level, in supporting the validation and application of newly generated knowledge and novel technologies will pave the way to adopting a more robust systemic approach to innovation. In addition, pathways to deployment of research by commercial stakeholders requires insights into market opportunities and needs.

The European aquaculture sector has shown that it can contribute to several of the anticipated impacts. EATiP believes that the following research and innovation actions are key to test and demonstrate systemic innovations for sustainable food from farm to fork:

- Aquaculture is widely recognised by experts as being a low carbon food production system. Action is to be taken to make sure that also citizens acquire a better understanding of how the sector operates and how the products are produced. Involvement of social scientists and communicators, combined with openness of the industry towards society at large will simulate a broadening of public awareness.

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- In aquaculture, climate neutral food production needs to be expanded from the farm to the ecosystem. The flow of carbon (and of other nutrient between different organisms) in the aquatic system is highly complex. Therefore, EATiP recommends to perform aquaculture climate impact assessments at regional scale in a Marine Spatial Planning approach instead of at a farm level. This can be achieved through the cultivation of low-trophic species, such as algae, combined with high value fish species within the same ecosystem boundaries
- Water has become increasingly scarce. In combination with energy optimization, water-efficient food production systems should be stimulated. As a non-consumptive user of water, aquaculture shows a low water footprint, particularly in extensive and in recirculation systems. The latter is at the same time an efficient collector of valuable nutrients, such as nitrogen and phosphorous, turning them into contributors to the zero pollution goal.
- In connection to maximizing energy efficiency while reducing the carbon footprint, the role of waterborne transport of seafood as alternative to airborne or transport by road should be analysed. This is to be combined with an optimisation of novel food processing technologies and packaging techniques to improve the shelf-life of seafood.
- A dramatic reduction in the use of antibiotics (as seen in the Norwegian salmon industry - from 48,500 to 649 kg over 20 years with a 10-fold production increase) was induced by large-scale vaccination. Moving from treatment to prevention has greatly improved predictability in salmonid farming worldwide, and may be used as a best practice example for other sectors.
- The reduction of food losses and waste is crucial. New technologies are already in the testing phase to further improve the recovery of high-value waste (proteins and fish oils) generated during the aquaculture value chain. Research on treatment and reutilization of effluents, sludge and by-products from aquaculture processing plants will both counteract the challenge of limited access to feed resources and increase the sectors contribution to the circular economy.
- Operational animal welfare indicators throughout the production chain, incl. transport and slaughtering, should be validated. An improved understanding of multivariate factors affecting livestock health and welfare is critical. This implies the need for models for epidemiological studies in aquaculture, implementation of sanitary control, design of effective biosecurity plans, and application of (immune)prophylaxis measures . The development of Integrated Pest Management programs for Aquaculture Zones has been suggested. The industry requires efficient and easy to use diagnostic tools to tackle health alterations at an early stage. Research should be encouraged to develop tools and indicators for reporting, exploiting data and modeling different mortalities.

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