

# Organic Aquaculture Feeds for Mediterranean Species: Needs, opportunities, and mismatches

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## Abstract

*In common with other forms of food production, there is a rise of consumer interest in organic aquaculture. However, both feed manufacturers and fish farmers have been slow to adhere to an organic farming system, since it is felt that a clear and unified definition of standards and certification scheme are lacking in the sector. Our interest is focused on discussing some critical points regarding the development of fish feeds and feeding protocols, specifically associated with the southern European organic aquaculture farming conditions.*

*It is now clear and generally accepted that the excessive dependency of fishmeal and fish oil as ingredients has to be strongly reduced in organic aquaculture feeds. The consequence of restricting the purchase of raw material to those only from traceable sources of stocks considered as sustainable is an inevitable increase in costs as a result of ensuring traceability and a reduced (and possibly) more variable supply base.*

*However, this also opens up a series of opportunities for innovation. Research on the potential of new feed ingredients dedicated to organic aquaculture is needed. A few examples are:*

*the usage of unavoidable fish industry discards and waste from fish processing (while safeguarding against intra-species recycling of discards and waste to avoid the potential risks of disease spread).*

*the usage of vegetable ingredients derived from certified organic origin. Their availability and traceability in the current market is extremely scarce. Nevertheless, while developing these vegetarian feeds for carnivorous species, one should ensure that it brings no adverse effect to the aquatic animal's physiology, welfare, environment, and ultimately taste of the final seafood product.*

*One of the major criticisms facing the intensive aquaculture industry in developed countries is the fact that it targets known carnivorous species, such as salmon, trout, cod, or seabass and seabream, which of course rely heavily on fishmeal and high protein diets. Debate is rising about the opportunity for organic aquaculture farmers to start new fish farming practices in Europe. Research is also needed in this area to identify and evaluate fish species that do not require fishmeal and oil or species with naturally herbivorous feeding habits. Organic certification of these species should be "easier" due to the ability to completely bypass the issue of pelagic species feed sustainability. The potential of polyculture systems, in which several fish species are farmed simultaneously in the same water body, needs to be evaluated.*

*Innovative R&D activities applied to fish feed ingredients, feeding processes, and farming systems can be important tools to overcome some of the issues that are presently hindering the development of organic aquaculture in Southern Europe.*