



Ratio of use of marine ingredients in fish feeds known as “Fish In Fish Out” (FIFO)

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1 Communication about the use of marine raw materials in Aquafeed

Marine raw materials used in aquafeeds for aquaculture product consumed in Europe should be expected to achieve standards based on responsibly managed resources, according to the FAO Code of Conduct for Responsible Fisheries, where that material is available. This should include imported aquaculture products, as well as those produced in Europe.

Currently two international standards are available for documenting this, IFFO RS and MSC. Ideally, the ambition should be to take the concept further, ultimately to the application of an eco-based management of fisheries approach covering the supply of raw material for fishmeal and fish oil manufacture. That, however, is a collective responsibility and will not be attained as a goal except with the support of all stakeholders, and especially of national governments.

Aquaculture fed production globally has increased from about 25 mill to 45 mill ton from 2007 to 2017 while fisheries for Marine Ingredient production (Fishmeal and oil) have stagnated or slightly reduced from 5 mill ton to 4,5 mill ton, equal to about 15 mill ton forage fisheries and 5 mill ton of trimmings.

Aquaculture development has resulted in a shift whereby marine raw materials have now a relatively larger part used for aquafeed instead of pig and poultry feeds or the loss of fish oil in the hydrogenation into margarine products. The inclusion of marine ingredients in aquafeed also has gone down significantly due to relatively static supply, increasing demand, high prices and better nutritional knowledge.

With a finite supply of fishmeal and fish oil, further growth of the aquaculture feed production will have to result in an even further reduction of the inclusion of marine resources in the diets. Trimmings from aquaculture products represent a potential new source of raw material for fishmeal and fish oil manufacture, analogous to the production of processed animal proteins from the terrestrial farming sector.

In addition, new raw materials such micro algae, single cell proteins, insect meal and improved traditional raw material like soy, rape, corn will be necessary, although some of these materials are yet a long way from achieving commercial volumes of supply. Also, more specific knowledge about the exact nutritional requirement for individual species will be important, as these tend to vary across the high number of fed aquaculture species. Any other ingredient used in aquafeeds should be expected to be subjected to the same level of scrutiny applied to marine-source materials. Over time this equivalent level of assessment may be undertaken by certification schemes, and the adoption of third-party independently-audited certification schemes may support the implementation of this approach.

2 Fish produced per kg fish caught

Environmental NGOs are promoting the consumption of what they regard more 'vegetarian' fish. Nevertheless, the reality is that present consumers are not only eating more carnivorous fish for the taste, but also because of the amount of omega-3 in the fish. Besides this, the present European aquaculture industry is dominated by carnivorous fish species.

As AAC our target is a sustainable development of the European Aquaculture industry. Marine ingredients continue to provide essential nutrition for the industry, and that will remain so for the foreseeable future. Looking at how marine-sourced materials is part of the overall picture of the industry's sustainability. It is pertinent to ask whether in cases where marine ingredients are used whether they originate from responsibly managed sources. It is also interesting to ask the question of whether it is relevant to limit the inclusion rate in order to facilitate and encourage even more efficient use of marine ingredients. In reality, the previous two decades have shown that the main factor over time has been shown to be market forces where competition to produce the most efficient diets (price X FCR) has driven a decrease in inclusion rate in aquafeeds. Neither FFDR or FIFO is relevant for describing whether a certain aquaculture product is produced based on responsible managed resources.

The application of the concept of a Forage Fish Dependency Ratio (FFDR) for FM and FO for individual species, is a way to show whether FM or FO is the most critical component (by volume) in the diets. It does not consider that the surplus of the other marine ingredient is worldwide being used in feed for other aquaculture species. The similar concept of Fish In:Fish Out ratios (FIFO) also describes the general (per species) conversion of whole, wild-captured fish into marine ingredients, then into an aquaculture product where nothing is lost (or not used) when taken at a global perspective.

Nevertheless, these terms do not acknowledge some important factors that underpin their beneficial incorporation of FM and FO in aquafeeds, such as the superior efficiency of conversion of protein and energy by aquatic species.

3 Conclusion

The AAC recognizes difference between FIFO and FFDR and how it is used by different stakeholders in different situations. Having said that, with a finite supply of fishmeal and fish oil, further growth of the aquaculture feed production will automatically result in an even further reduction of the inclusion of marine resources in the diets.

The AAC believes it is more important to communicate to the media and the consumers the need for sustainable sourced marine ingredients for fish feed and that any other ingredient used in aquafeeds. The latter should be expected to be subjected to the same level of scrutiny applied to marine-source materials whilst also of stressing the need of reduction of FIFO within the EU aquaculture sector.



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