

## **Lipid Composition in Future Fish Feeds**

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New raw products are a prerequisite for a growing fish farming industry. However, new feed formulas will need to be investigated thoroughly, as reducing the beneficial health effects for humans and also jeopardizing the welfare of the fish is a possible effect. The replacement of fish oil with plant oil will cause a change in biochemical composition of the fish feeds. Not only the fatty acid composition will be altered, mostly towards a lower amount of “marine” fatty acids, such as DHA (22:6 n-3) and EPA (20:5 n-3) but also a higher content of other minor plant based lipids such as phytosterols and different antioxidants such as carotenoids, tocopherols, tocotrienols and phenolic compounds is expected. These lipid compounds are poorly investigated in the connection to fish feed and their metabolic effects in predatory, carnivorous fish. We know from human and other mammalian studies that many different metabolic changes are seen as an effect of ingestion of these substances.

In this study, we investigated the content of phytosterols in some commercially available fish feeds. Analyses of phytosterols were performed by GC and GC-MS. Formulas where fish oil was partly replaced by rapeseed or soy oil were included in the study. Both sitosterol and campesterol were quantified in the commercially available feeds. In addition, the level of phytosterols increased with the amount of vegetable oil used in the feed. However, in the feed without vegetable oil only trace amount of phytosterols were found.

The demand for fish and fish products will increase and the human consumption of salmonid fish is mainly fulfilled by a growing fish farming industry but also farming of other species like cod, perch, sea bass, sea bream are increasing. Due to the fact that the availability and supply of traditional fish-based raw ingredients for fish feeds is a limiting factor for further growth of the industry, a lot of attention has to be directed in order to find good and secure alternatives.