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Effect of replacement of marine ingredients with vegetable oil and protein on oxidative changes during ice storage of rainbow trout (*Oncorhynchus mykiss*)

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Recently, fish meal and fish oil have increasingly been replaced with proteins and oils from vegetable sources in the diets of farmed salmonids, but the consequences for the oxidative stability of the resulting fish products have only been investigated to a limited extent. This presentation will discuss results from two recent studies from our laboratory on this topic. In the first study, rainbow trout were fed six different diets, which differed in the ratio between marine oil and proteins vs. vegetable oil and protein. Rapeseed oil was used as the oil source and the vegetable proteins were a mix based on pea, wheat, sunflower and beans. In the second study, one group of rainbow trout was fed a traditional diet based on fish meal and fish oil, whereas the other five groups were fed diets in which 40 % of the fish meal was replaced with plant proteins from peas, horse bean and rapeseed. The oil source was either fish oil, linseed oil, sunflower oil, rapeseed oil or grapeseed oil. Rainbow trout was stored on ice for up to 14 days. In both studies, the effect of the feeding regime on the fatty acid composition and lipid oxidation in the fish fillet was determined. In the first study, the effect of the diet on protein oxidation in fish fillets was also determined. In both studies, feeding regimes significantly influenced fatty acid composition. Moreover concentration of primary oxidation products at the end of the storage period was highest in fish fed lipids with the highest unsaturation index and lowest in fish fed with lipids with low unsaturation index. The effect of the diet on secondary oxidation products differed between different types of volatiles. There were no clear effects of diets on protein oxidation, but data indicated that compounds present in the marine ingredients might have had an effect on protein oxidation.