

NUTRIGENOMICS STUDY IN ATLANTIC SALMON (*SALMO SALAR*) FED NOVEL DIETS SUPPLEMENTED WITH MARINE BY-PRODUCTS

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The processing of seafood for human or animal consumption creates vast amounts of by-product, which is often considered waste. Although some of these by-products are used as fishmeal, bone-meal or fertilizer, they remain underutilized as a whole. Significant amounts of proteins, lipid fractions, vitamins, and other bioactive molecules are present in these by-products, with potentially beneficial properties for use as alternatives to fishmeal or as supplements for aquaculture species. In an attempt to investigate their potential benefit in Atlantic salmon fish nutrition, nine experimental diets were formulated to include marine by-products originating from various seafood processing plants. Juvenile Atlantic salmon were fed one of the nine experimental diets (30% marine by-product, 70% basal diet) or the basal diet alone. Hepatic gene expression profiling was done on fish fed each diet after 14 and 56 days. Analysis of hepatic gene expression revealed a significant amount of differentially expressed genes for each diet with roles in various pathways and biological processes. By comparing differences in hepatic gene expression levels with the nutritional composition of the various feeds, we were able to identify a number of nutritional elements that affect specific gene families. This information will be very useful for the formulation of novel fish feeds, which may be designed with specific aims, such as rapid growth, increased immunity or better overall health.

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