Incorporation of Plant Proteins into Marine Finfish Feeds

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Abstract: The concomitant replacement of fishmeal and fish oil in marine fish feeds by more sustainable terrestrial alternatives is problematic due a variety of nutritional concerns and reduced feed intake. Through a scientific exchange with YSFRI, we studied the utility of employing specialty fish meals to facilitate the transition of sablefish *Anoplopoma fimbria* to plant-based feeds. These specialty meals were prepared from fishery processing waste derived from US fish processors and employed either fresh rendering technology developed at NWFSC, or a hydrolysis process developed at YSRFI. The specialty meals were incorporated as minor ingredients in alternative plant based fish feeds, recently developed for sablefish at NWFSC. A 4-week growth trial, focused on measuring feed intake and growth, was conducted with a feed containing freshly rendered Atlantic salmon processing waste (trim), a feed containing an enzymatic hydrolysate prepared from Pacific whiting processing waste (hydrolysate), and a feed containing conventional fishmeal (control). Acceptable growth and feed conversion (FCR) were obtained with all diets, however, trim and hydrolysate fish had significantly higher feed intake and weight gain than control fish ($p < 0.05$). FCR of trim fish was improved over that of hydrolysate and control fish ($p < 0.05$). Results from this study demonstrate the potential of incorporating specialty fish meals into plant based feeds for marine fish to increase feed intake, growth, and improve FCR. Future research is planned between NWFSC and YSFRI researchers to investigate the potential of additionally incorporating macroalgae into alternative feeds containing these specialty meals.

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