Supplementing enzymes to extruded, soybean based diet improves breakdown of non-starch polysaccharides in rainbow trout (Oncorhynchus mykiss) - DTU Orbit (28/07/2019)

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Plant-based feed ingredients typically contain remnants of dietary fibres [DF; non-starch polysaccharides (NSP) and lignin] that have various antinutritive effects in carnivorous fish. Exogenous enzymes have been shown to improve the apparent digestibility coefficients (ADC) of plant-based diets presumably by assisting in the breakdown of NSP. This study examined the effects on NSP degradation when supplementing β-glucanase, xylanase, protease or a mix of the three enzymes to an extruded, juvenile rainbow trout (Oncorhynchus mykiss) diet containing 344 g kg$^{-1}$ de-hulled, solvent-extracted soybean meal (SBM). The NSP content in the non-supplemented control diet and in faecal samples from the dietary treatment groups was analysed to determine the recovery/apparent digestibility of cellulose and total non-cellulosic polysaccharide (T-NCP) sugar monomers. The enzymes had significant, positive effects at the pH range and temperature prevailing in the gastrointestinal tract: β-glucanase improved the ADC of mannose, galactose and uronic acids; xylanase and protease improved the ADC of xylose; and protease furthermore improved the ADC of mannose and uronic acids. There were no effects when supplementing all three enzymes together. In conclusion, exogenous enzymes may potentially be applied to fish feed containing SBM, assisting in the breakdown of NSP and alleviating some of the antinutritive effects

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