Modelling the effects of dietary methionine level and form on postprandial plasma essential amino acid profiles in rainbow trout (Oncorhynchus mykiss) - DTU Orbit (21/08/2019)

Modelling the effects of dietary methionine level and form on postprandial plasma essential amino acid profiles in rainbow trout (Oncorhynchus mykiss)

Aquafeed formulation is susceptible to affect amino acid (AA) availability for metabolic functions. Statistical models were applied to quantify the effect of dietary methionine level (from 6.01 to 16.17 g kg⁻¹ dry matter) and form (free, coated or bound) on postprandial concentrations of plasma essential amino acid (EAA) in rainbow trout. Twelve diets were formulated with pea and soya protein concentrate or fish meal as the main protein ingredients and were supplemented or not with increasing amount of either crystalline or agar-coated methionine. Fish were acclimatized to one of the 12 diets for 6 weeks before postprandial plasma sampling (six sampling points up to 36 h, seven fish each time), further analysed for EAA content. Using generalized additive models, we show that (i) dietary methionine level and form explained 74% postprandial methionine plasma variations and that (ii) the methionine dietary form and plasma concentrations significantly affected the plasma concentrations of the other EAAs. Finally, linear model revealed a positive relationship (R² > 0.9) between plasma concentrations of the three branched-chain AAs under the present experimental conditions. The results obtained add new information on the dietary effects on EAAs in the plasma availability and the interactions between them.