

### 3. Effect of dietary starch and ash level on nutrient digestibility and faecal waste characteristics of rainbow trout (*Oncorhynchus mykiss*)

Satya Prakash<sup>a,b,\*</sup>, Roel M. Maas<sup>a</sup>, Jules Elbers<sup>a</sup>, Fotini Kokou<sup>a</sup>, Philip A. J. Prabhu<sup>b</sup>, Johan W. Scharma<sup>a</sup>

<sup>a</sup>Aquaculture & Fisheries (AFI) group, Wageningen University & Research, The Netherlands

<sup>b</sup>Feed and Nutrition research group, Institute of Marine Research, Bergen, Norway

\* Corresponding author. E-mail: [satya.prakash@wur.nl](mailto:satya.prakash@wur.nl)

Waste management is a crucial issue in recirculating aquaculture system (RAS). The main source of solid waste in RAS is faecal waste. Nutrient composition of diet determine the quantity and characteristics of faecal waste (particle size distribution (PSD), sinking velocity, density, stability, composition and the removal efficiency) which influences the suspended and dissolved solids load in the system. This study investigated the effect of starch and ash levels in the diet on quantity and characteristics of faecal waste in rainbow trout (*Oncorhynchus mykiss*). Four diets were formulated according to a  $2 \times 2$  factorial design. The first factor, starch was tested by including 10% gelatinized wheat flour (LS-low starch) or 30% gelatinized wheat flour (HS-high starch). The second factor, ash was tested by adding 2% diamol (HA-high ash) or no diamol (LA-low ash). Tanks (experimental units) were stocked with 25 rainbow trout and the experiment was run for 5 weeks. Both starch and ash level reduced the DM digestibility of diet ( $p < 0.05$ ), resulting in higher amount of faecal waste production, but no interaction effect was observed. The sinking velocity and the density of faeces were higher in the diets with high ash. Starch and ash level in the diet, or their interaction had no significant effect ( $p > 0.05$ ) on faecal PSD, stability, removal efficiency, and non-removed faeces in the system. Overall, the study shows that dietary starch and ash level increase the faecal waste production but do not impact the solid waste accumulation in RAS.