

### 13. Impact of physical quality of extruded feed on the kinetics of digestion and feed intake of Spotted seabass (*Lateolabrax maculatus*)

Shujuan Xing<sup>a,c</sup>, Xiaoze Xie<sup>a</sup>, Xiaofang Liang<sup>a</sup>, Peter A. Wierenga<sup>c</sup>, Johan W. Schrama<sup>b</sup>, Min Xue<sup>a</sup>

<sup>a</sup> National Aquafeed Safety Assessment Centre, Institute of Feed Research of CAAS, Chinese Academy of Agricultural Sciences, Beijing 100081, China

<sup>b</sup> Aquaculture and Fisheries, Wageningen University and Research, Wageningen, the Netherlands

<sup>c</sup> Laboratory of Food Chemistry, Wageningen University, Wageningen, the Netherlands

This study aimed to investigate the effect of the physical quality of extruded pellets on the physiological response in Spotted seabass. Experimental feeds (identical formula) with contrasting physical quality were produced by the adjustment of preconditioner moisture addition (22 and 28%).

Feed extruded with more water added in the preconditioner resulted in a higher hardness and longer hydration time (HT). Spotted seabass (159g) were fed to satiation twice daily in freshwater, for 48 days. Faeces were collected during the experiment period for nutrient digestibility measurement. Chyme from stomach and intestine was collected at 0.5, 2, 4, 6, 8, 10, 12, 16 and 24h after a single meal and analysed for dry matter (DM) content, crude protein (CP) and inner marker ( $Y_2O_3$ ) concentration. Results showed that the physical quality of extrudates had no significant effect on the feed intake, growth and nutrient digestibility of *Lateolabrax japonicus*, but had a pronounced effect on gastric emptying, kinetics of digestion, water flux and digestive enzyme concentrations in the gastrointestinal tract. The feed with higher hardness had a longer gastric emptying time. Furthermore, a noticeable different pellet water absorption rate was found in fish's stomach during postprandial 0.5 to 4h between treatments. Thereafter, the gastric chyme moisture of fish stayed similar. The DM and CP digestibility of gastric chyme in fish fed with a high hardness diet was significantly higher than that of the other one at postprandial 6h. Pellet physical quality also significantly affected pepsin and chymotrypsin concentrations in gastrointestinal tract during postprandial 2 to 8h, and the variation trend of which were consistent with gastrointestinal evacuation rate. Therefore, it is desirable to consider feed physical quality when developing a comprehensive nutritional formula and evaluating the results from biological fish trials.