

1. Effect of emulsifier supplementation on nutrient digestibility, faecal characteristics and bile acid balance of yellowtail kingfish (*Seriola lalandi*).

Yaqing Zhang², Peter Horstmann^{1,2}, Roel M. Maas², Satya Prakash², Thomas W. O. Staessen¹, Fotini Kokou², Johan W. Schrama^{2*}

¹ Kingfish Zeeland, The Kingfish Company, Kats, The Netherlands.

² Aquaculture and Fisheries Group, Wageningen University and Research, Wageningen, The Netherlands

* Corresponding author. E-mail: johan.schrama@wur.nl

Yellowtail kingfish (*Seriola lalandi*), a marine species is recently cultured in recirculation aquaculture systems (RAS). The major challenge of farming yellowtail kingfish in RAS is their poor faecal quality which is difficult to remove, resulting in high concentrations of total suspended solids in the RAS. One possible way to improve faecal waste management is to increase nutrient digestibility by adding emulsifiers to the feed. Emulsifiers are typically surface-active molecules which attach to the surfaces of fat globules, and promote fat disruption, leading to the formation of small fat droplets and micelles for further digestion and absorption. This study assessed the effect of emulsifier supplementation on nutrient digestibility, faecal waste production and characteristics, and bile acid balance of yellowtail kingfish. This was investigated by using four experimental diets differing in emulsifier supplementation, where fish were fed restrictively for 36 days. One diet without supplement served as control, three types of emulsifier were tested (1) 0.1% E484, composed of 21% ethoxylated castor oil; (2) 0.1% Lysophospholipids (LPL) combined with 1% lecithin; (3) 0.4% taurocholic acid (TCA). Our results showed that LPL and TCA can improve fat digestibility, which can be partially explained by bile acid balance. Bile acid balance indicates that an accumulation (positive) or loss (negative) of dietary bile acids in the body bile acid pool. Furthermore, the four diets had similar faecal waste production. Fish fed the E484 diet had more faeces recovered than the other diets, whilst non-recovered faeces or faecal characteristics were not affected.