Do dietary amino acid profiles affect performance of larval gilthead seabream?

Live preys commonly used in fish larval rearing seem to be imbalanced in terms of amino acids. Manipulation of their amino acid composition is difficult, but the use of microencapsulated diets allows this manipulation. This study analysed the effect of amino acid supplementation, in order to compensate for dietary amino acid imbalances, on growth and survival of gilthead seabream (Sparus aurata) larvae. Larvae were reared until 32 days after hatching, in a closed recirculating water system (19 °C), using only live food (rotifers and Artemia). Thereafter, larvae were fed Artemia or one of the experimental microencapsulated diets: supplemented with indispensable amino acids (IAAsup diet), or supplemented with dispensable amino acids (DAAsup diet). Experiment lasted for 10 days. Dietary supplementation with indispensable amino acids resulted in A/E ratios [(each indispensable amino acid) × (total indispensable amino acids)−1 × 1000] more similar to the ones of larval seabream and in higher IAA:DAA ratios than in the DAAsup diet. Survival was similar in larvae fed the IAAsup diet (75%) or Artemia (87%), but was significantly lower in larvae fed the DAAsup diet (52%). Larvae from all treatments more than doubled their average dry weight during the experimental period. Final dry weight was similar in larvae fed both microcapsules, but these were lighter than larvae fed with Artemia. Relative growth rate (RGR) and total biomass production tended to be higher in larvae fed the IAAsup (RGR = 9% day−1) than the DAAsup diet (RGR = 7.5% day−1) and only in this last treatment these parameters were significantly lower than in larvae fed with Artemia. Therefore, dietary supplementation with indispensable amino acids resulted in a more balanced dietary amino acid profile, which significantly increased survival. Further studies introducing microdiets earlier in the development seem necessary in order to optimise growth.

Auteurs du document : Cláudia Aragão, Luís E.C. Conceição, Marc Lacuisse, Manuel Yúfera, Maria Teresa Dinis
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