Improved growth performance in rainbow trout Oncorhynchus mykiss reared at high densities is linked to increased energy retention - DTU Orbit (16/12/2018)

Improved growth performance in rainbow trout Oncorhynchus mykiss reared at high densities is linked to increased energy retention

Behaviour has been suggested as an underlying factor influencing how rearing density affects growth performance in Salmonid fishes. At low densities there is an elevated intensity of aggressive interactions and the formation of dominance hierarchies. As density increases, it is commonly assumed that aggression decreases, as the cost and effort required to establish and maintain dominance hierarchies increase. The increased energy expenditure associated with aggressive interactions has been identified as one mechanism causing a reduced efficiency in feed utilisation and therefore decreased growth performance. Manipulating aggressive behaviour through density may have advantages from a practical perspective. In the present study the energetic expenditure of rainbow trout held at three densities, 25, 80 and 140 kg m\(^{-3}\), were related to growth performance parameters. Measurements for growth performance and parameters of energetics were investigated at the three densities during a four week growth period. The results showed a significant increase in routine metabolism in fish reared at 25 kg m\(^{-3}\) compared to groups reared at higher densities. The study concludes that in fish reared at density of 25 kg m\(^{-3}\), a higher fraction of the dietary energy intake was used to fuel activity rather than growth, as evidenced by significantly higher routine metabolism, reduced feed utilisation efficiency and a tendency for lower growth performance compared to fish reared at the higher densities. These results indicate a bioenergetic advantage of crowding. (C) 2015 Published by Elsevier B.V.

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