

3.2 Effects of salinity on feeding behavior and feed utilization efficiency

Salinity affects yellowfin seabream growth partly through changes in feeding behavior and feed utilization efficiency. In the same 56-day experiment, salinity above 24‰ not only reduced growth but also impaired feed utilization, showing that performance loss at elevated salinity reflects lower efficiency of converting feed into biomass rather than body weight change alone (Mozanzadeh et al., 2021). Supporting evidence from the 2014 acclimation study showed that the best feed conversion ratio occurred at 7 and 15 g/L, while higher salinity weakened conversion efficiency and coincided with transient weight loss after transfer. This suggests that the feeding response of yellowfin seabream is sensitive to both absolute salinity and acclimation stress.

Evidence from other cultured fishes indicates that salinity can modify feed intake itself as well as post-ingestive efficiency. In Asian seabass, intermediate salinity yielded the lowest feed conversion ratio, while discussion of the same experiment noted that increasing salinity can suppress appetite and thereby contribute to poorer growth. Similar declines in feed intake and protein utilization with rising salinity were reported in common carp and grass carp, where higher salinity increased feed conversion ratio and reduced protein intake, consistent with a shift of dietary energy toward maintenance and ionic regulation rather than tissue deposition. For yellowfin seabream aquaculture, this means that salinity management should be considered part of feeding strategy, because unsuitable salinity can reduce both appetite and feed-use efficiency even when fish remain alive.

3.3 Effects of salinity on body composition and nutrient metabolism

Salinity variation also changes body composition and nutrient allocation in yellowfin seabream. Juvenile *A. latus* reared at 23 and 30 g/L showed reduced proportions of protein, fat, and moisture together with increased ash content relative to lower-salinity groups, indicating that high salinity can alter both tissue deposition and carcass quality. More recent evidence in juvenile yellowfin seabream shows that salinity does not act only at the level of proximate composition, but also reshapes metabolic regulation: fish cultured at 10 ppt upregulated gut-associated metabolic, biosynthetic, and ion-transport genes, whereas fish at 30 ppt showed a stronger immune and redox-oriented transcriptomic profile (Peng et al., 2025). This implies that moderate salinity favors anabolic and nutrient-processing functions, while higher salinity shifts physiological investment toward stress adaptation.

Results from other euryhaline aquaculture species reinforce this interpretation. In GIFT tilapia, increasing salinity decreased whole-body lipid content but increased protein content, demonstrating that salinity can reorganize nutrient partitioning rather than simply depress overall growth. In blue tilapia, brackish-water culture improved growth and was associated with higher amino acid and fatty acid content together with activation of pathways related to unsaturated fatty acid biosynthesis and anabolic metabolism (Zhou et al., 2024). Taken together, these studies suggest that in yellowfin seabream, salinity-mediated differences in growth performance are closely linked to changes in nutrient metabolism, tissue composition, and the balance between anabolic processes and stress-related energy expenditure.

Salinity variation therefore affects yellowfin seabream growth performance through three coupled pathways: direct effects on growth rate and weight gain, indirect effects through feeding and feed conversion, and compositional effects through nutrient metabolism and tissue deposition. For *A. latus*, the evidence consistently indicates that moderate brackish salinity is more favorable than salinity extremes for efficient growth and better physiological allocation.

4 Effects of Seawater Salinity Variation on Physiological Health of Yellowfin Seabream

4.1 Changes in hematological physiological parameters under salinity stress

Salinity stress changes hematological and blood biochemical indices in yellowfin seabream mainly by disturbing osmotic balance and activating a short-term stress response. In juvenile *A. latus*, acute transfer from 20 ppt to 34, 12, or 5 ppt caused significant increases in blood glucose and lactate after 2 h, but both variables returned toward basal levels within 24-48 h, indicating that metabolic disturbance was rapid and largely reversible during acclimation. In the same study, blood electrolytes did not change significantly across salinity treatments, suggesting that juveniles were able to maintain ionic homeostasis even while stress-related metabolites fluctuated. Cortisol and