Dietary supplementation of yeast (Saccharomyces cerevisiae) improves growth, stress tolerance, and disease resistance in juvenile Nile tilapia (Oreochromis niloticus)

The yeast Saccharomyces cerevisiae is one of the commonest probiotics incorporated in aquafeeds. An 84-day feeding trial was conducted to evaluate the effects of varying dietary inclusions of S. cerevisiae, 0% (control), 3% (YF3), 5% (YF5), and 7% (YF7), on growth, stress tolerance, and disease resistance in juvenile (body mass ~ 21 g) Nile tilapia (Oreochromis niloticus). Fish were randomly distributed in groups of 20 into 12 1-m³ hapas and fed isoenergetic (~ 17 kJ g⁻¹ gross energy) and isonitrogenous (~ 300 g kg⁻¹ crude protein) diets at 3% of their bulk weight daily. Specific growth rates were significantly higher for the yeast-fed fish (0.77–0.78% day⁻¹) than for the control fish (0.60% day⁻¹) and resulted in significantly higher mean final weights for the yeast-treated groups. Protein and lipid retention efficiencies were also significantly higher in the yeast-fed fish than in the control group. In subsequent stress challenge trials, the yeast-fed fish had greater tolerance to acute heat as well as hypoxia exposure than the control fish. Survival rates of the yeast-treated groups following sudden exposure to elevated water temperature (40 °C) ranged from 82.5 to 100% compared to 15% for the control. Mean survival rates following a 24-h hypoxia exposure were also generally significantly higher for the yeast-fed fish. The probiotic groups recorded a relative percent survival (RPS) of 75% after a 14-day Aeromonas hydrophila infection challenge. The results of this study indicate that S. cerevisiae as an additive in Nile tilapia diets has beneficial impacts on growth, stress tolerance, and disease resistance.

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