

Effects of Different Levels of Commercial Probiotics on Growth Performance, Survival and Carcass Composition of Nile Tilapia (*Oreochromis Niloticus*) Reared in Cages in Low Input Ponds

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ABSTRACT

Nile tilapia (*Oreochromis niloticus*) is the most cultured fish in Kenya. Its culture is mainly in low input ponds where supplementary feeding is done alongside pond fertilization. To improve nutrient utilization growth of fish, probiotics are important having received much attention as a new strategy in aquaculture. A feeding trial was conducted to evaluate the effects of different levels of dietary probiotic, *Saccharomyces cerevisiae* and *Bacillus subtilis* Nile tilapia reared in low input ponds. Fingerlings averaging 40g were randomly distributed into 28, 1.25 m³ net cages (1.0 × 1.0 × 1.25 m) suspended in earthen pond and stocked at 50 fish m⁻³. Fish were fed on 28% crude protein diets supplemented with different levels of probiotic. The diets were supplemented with *S. cerevisiae* at 3 concentrations of 2g kg⁻¹ (Diet 1); 4g kg⁻¹ (Diet 2); and 6g kg⁻¹ (Diet 3); and *B. subtilis* at 3 concentrations of 5g kg⁻¹ (Diet 4); 10g kg⁻¹ (Diet 5); and 15g kg⁻¹ (Diet 6). The control diet (Diet 0) was not be supplemented with any probiotic. The fish were fed twice daily at a rate of 3% of the total fish biomass for a period of 9 months. At the end of the experiment, fish fed the diets supplemented with probiotics showed significantly better (P<0.05) final weight, body length, specific growth rate, weight gain and feed conversion ratio compared to those fed the control diet. The highest final weight (255.31g) was recorded for fish fed 4g kg⁻¹ *S. cerevisiae* (Diet 2). The highest survival rate (89.50%) was recorded for fish fed supplemental *S. cerevisiae* at 4g kg⁻¹ (Diet 2) compared to other groups and the control which had significantly lower survival of 77%. The carcass composition of the fish fed on probiotic

supplemented diets significantly differed from the control ($P < 0.05$). *S. cerevisiae* recorded high protein (86.06%) at 4g kg^{-1} (Diet 2) while *B. subtilis* led to higher protein (89.40%) at 5g kg^{-1} (Diet 4) compared to the control diet. The lipid content was significantly higher ($P < 0.05$) in the probiotic supplemented feeds compared to the control. The result of this study indicates that probiotics can enhance nutrient utilization and improve growth and body composition of Nile tilapia in low input ponds.

Keywords: *Bacillus subtilis*, Growth, Nile Tilapia, Probiotics, *Saccharomyces cerevisiae*

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