

Interaction of Spirulina with Different Levels of Vitamin E on Growth, Reproduction, and Coloration in Goldfish (*Carassius auratus*)

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Abstract

The interaction between spirulina (30 g/kg diet) and different levels of vitamin E (100, 200, 300, and 600 mg/kg diet) on growth, gonad weight, reproduction, and coloration were studied in goldfish, *Carassius auratus*, for 120 days. The mean body weight increased with time in all experimental diets. Growth, gonad weight, and fecundity in fish fed the diet containing spirulina+300 mg vitamin E were significantly ($p<0.01$) enhanced, compared to other diets. Supplementation of vitamin E beyond this level significantly ($p<0.01$) reduced gonad weight and, subsequently, fecundity. Control fish spawned only once, with fewer eggs per spawn, than other groups, which spawned twice with a greater number of eggs per spawn. Females fed spirulina without vitamin E laid 703 eggs in two spawnings compared to 1057 eggs in fish fed with the spirulina+300 mg vitamin E diet. Fish treated with other combinations laid fewer eggs. While all combinations of spirulina and vitamin E significantly enhanced coloration, the combination of spirulina+300 mg vitamin E was the most influential.

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