

**PARTIAL REPLACEMENT OF BEEF HEART
WITH DUCKWEED (*Lemna minor*) LEAF MEAL
ON GROWTH PERFORMANCE OF KOI
(*Cyprinus carpio*)**

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By

**GALATHURE LEKAMALAGE UDANI CHATURIKA
JAYARATHNE**

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**Faculty of Animal Science and Export Agriculture
Uva Wellassa University**

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ABSTRACT

A feeding experiment was conducted to evaluate the effect of partial replacement of beef heart with duckweed (*Lemna minor*) leaf meal on growth performance of koi (*Cyprinus carpio*) fingerlings. Six different diets were formulated estimating 35 % crude protein. The diet 1 (control diet) contained 100 % beef heart and 0 % duckweed leaf meal. Beef heart was partially replaced by 10 %, 20 %, 30 %, 40 % and 50 % of dried duckweed leaf meal in the diets 2 to 6. Koi fingerlings (body weight 1.17 ± 0.01 g and average length 3.3 ± 0.05 cm) were reared in indoor glass tanks and three replicates were arranged for each experimental diet. Each tank was provided with continuous aeration. Feed ration was 5 % of body weight of fish over 49 days which was divided and offered at 0900 hrs and 1500 hrs daily. Water quality parameters were maintained and monitored daily. Results showed that the percentage weight gain recorded in fish fed with the experimental diets 2, 3, 4 and 5 were not significantly different from that of fish fed with the control diet ($P > 0.05$). There was no significant difference in specific growth rate of fish fed with the control diet and the experimental diets 2, 3, 4 and 5. Survival percentage of the fish fed with the experimental diets was not statistically significance difference ($P > 0.05$) at the end of the study period. The lowest feed conversion ratio was recorded for the diet 2 (1.56) and the highest feed conversion ratio (1.85) was recorded for fish fed with diet 5. There was a significant difference between FCR values of fish fed with diet 6 and the control diet ($P < 0.05$). Protein efficiency ratio of fish fed with any of the diet was not significantly different from that of the control diet ($P > 0.05$). However, growth performance and feed utilization was favored by low inclusion level of duckweed leaf meal in the experimental diets. Cost of production for 1 kg of feed also was considerably low for the diet 6 compared to the control diet. The results showed that 10 % of beef heart in a formulated diet for fingerlings of koi could be replaced by duckweed leaf meal very effective and 10 % to 40 % of beef heart could be replaced by duckweed with no adverse effects on growth, survival, FCR and PER of koi fingerlings at the end of the experimental period.

Key words: Koi, Duckweed, beef heart, crude protein, growth performance