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Effect of Dietary Phosphorus Concentration on Growth, Feed Utilisation and Body Composition *Labeo rohita* (Ham.) Fingerlings

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Abstract

Since phosphorus is widely responsible for water pollution, and feed is the ultimate source of this mineral, a feeding trial was conducted to adjust phosphorus concentration in the diet of Indian major carp (*Labeo rohita*) fingerlings for maximal growth. The effect of increasing dietary concentration of phosphorus on feed intake, feed conversion ratio (FCR), protein efficiency ratio (PER) and body composition of *L. rohita* fingerlings was also studied.

Five iso-nitrogenous and iso-caloric diets were prepared using fishmeal, groundnut oil cake, soybean meal, ground maize, oil and a vitamin-mineral mixture free of phosphorus. Sodium di-hydrogen phosphate was added to the basal diets to arrive at phosphorous (P) concentrations 6.8, 9.0, 11.0, 13.1 and 15 g kg⁻¹. Fifteen groups of fingerlings of 20 fish in each group, with mean initial biomass of 135 g, were stocked in each of 150 L cement tanks. Each diet was hand fed to triplicate groups of fingerlings, three times daily, till satiation. At the end of 29 days experimental feeding final biomass in each tank was recorded, fish were killed, homogenized and analysed.

Mean final phosphoreous contents (g P kg⁻¹) and fish biomass were: 6.8 g P, 158 g; 9 g P, 169 g; 11 g P, 185 g; 13.1 g P, 173 g; 15 g P, 163 g. The fish fed with the diet added with 11 g P kg⁻¹ attained the highest ($p < 0.05$) final biomass, so also gained the highest net biomass. Total feed consumption by the groups per unit biomass did not vary significantly ($p > 0.05$) during study. The significantly highest FCR was observed in fish fed on 11 g P, and the lowest FCR was observed in those fed 6.8 g P and 15 g P. The PER value of fish that were fed on diets containing 9.0–13.1 g P was similar, and these values were significantly higher than that of those fed 6.8 and 15 g P. The fingerlings accumulated increasing ($p < 0.05$) total ash as well as P and decreasing lipid ($p < 0.05$) in the whole body composition with increasing dietary P concentration. The broken-line regression analysis indicated that for maximum growth *L. rohita* fingerlings require 11 g P kg⁻¹ dry diet.

Keywords: Body composition, carp, growth, *Labeo rohita*, phosphorus