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# The Enhancing Growth Performance and Coloration of Koi Fish (*Cyprinus rubrofuscus*) through Feed Supplementation with Rumen-Fermented Carrots and *Bacillus* sp.

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- Abstract

Koi fish (*Cyprinus rubrofuscus*) is an ornamental fish with a relatively high percentage of domestic and international market demand, and its price is highly dependent on the body shape

and color quality. Adding carotenoids to feed is one technique to improve the quality and brightness of koi fish colors. This research aimed to analyze the effectiveness of carrot meal fermented using rumen fluid and *Bacillus* sp. in feed to improve the color and growth performance of koi. This experiment was designed using a completely randomized design method, consisting of four types of treatments, each of which was repeated three times, resulting in a total of twelve test units. The treatments tested included the use of carrot meal fermented by rumen fluid and *Bacillus* sp. at levels of 0% (control), 10%, 15%, and 20%. The parameters observed were carrot meal carotenoids after fermentation, fish color performance, feed utilization efficiency, feed conversion ratio, muscle glycogen content, specific growth rate, absolute growth, and survival of koi fish. Data were analyzed using analysis of variance and further tested using Duncan. The results showed the best in treatment C, 15% rumen microbe fermented carrot meal and *Bacillus* sp. in feed, and produced the best color performance, TFC 89.91%, FUE 87.54%, FCR 1.99%, MGC 16.79%, SGR 22.62%, AG 34.33g, and SR 100%. This information can help koi breeders improve the color and growth performance of koi fish by using fermented carrot feed, rumen fluid, and *Bacillus* sp.