Effect of different levels of multi-enzyme combo on blood parameters and immunity factors in fingerlings of Kutum (*Rutilus kutum*)

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Abstract

Rutilus kutum, is the most important and most economically valuable bony fish in the Caspian Sea. More survival and higher immunity have always been of concern in the propagation of this species. The present research aimed to study the effect of adding different levels of Combo multi-enzyme on blood parameters and immunity factors. For this purpose, 240 fingerlings of the Caspian kutum with a mean weight of 2.83±0.11gr were introduced to 6 tanks, with a density of 30 per m3, to establish 12 treatments of 3 replicates. The subjects were daily fed with diets containing 0, 1, 1.5, and 2 grams of Combo multi-enzyme for 60 days. In each section, they fed 10% of the body weight. blood parameters such as white blood cells, red blood cells, hemoglobin, hematocrit, and neutrophil and immunity factors like lysozyme, IgM, ALP, and ACH50 presented an improvement ($P<0.05$). The results showed these factors have been increasing with the addition of the Combo Multi Enzyme ($P<0.05$). But, some blood indexes such as MCV, MCH, and MCHC have not had meaningful statistical differences among experimental groups. Altogether, adding that Combo multi-enzyme, at a level of 1.5 grams per kg of diet, has improved in blood parameters and specific and non-specific factors in fingerlings of the Caspian kutum and can be used in nutrition of fingerlings of the Caspian kutum.

Keywords: *Rutilus kutum*, Multi-enzyme combo, Blood indices, Caspian Sea.