

Replacement of dietary fish meal with plant sources in rainbow trout (*Oncorhynchus mykiss*); effect on growth performance, immune responses, blood indices and disease resistance

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Abstract

The aim of this study was to examine the effects of replacing fish meal with plant sources on growth performance, immune responses, hematological parameters and disease resistance in rainbow trout. In this study, mean of initial body weight of fish was 15 ± 2 g and the experiment was carried out for a period of 60 days. Four experimental diets were formulated to replace 0, 40, 70 and 100% fish meal with plant protein sources (wheat gluten, corn gluten and soybean meal). According to results, higher plant protein inclusions (70 and 100%) resulted in undesirable effects on growth, nutritional indices, serum total immunoglobulin and alternative complement activity ($P < 0.05$). Otherwise, results suggested that it is possible to replace 40% of fish meal with plant counterparts without any noticeable negative effects on growth and humeral immune parameters (lysozyme activity and total antibody) ($P > 0.05$). Furthermore, replacement of fish meal with plant sources in all treatments had no significant effects on blood parameters (hematocrit, hemoglobin, white blood cells, heterophil and lymphocytes count). Finally, no significant differences were observed in fish mortality after 15 days of challenges with *Yersinia ruckeri* among treatments ($P > 0.05$).

Keywords: Plant protein, Growth, Immune response, Blood indices, Disease resistance, Rainbow trout

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