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## Complete Replacement of Fish Meal with Potential Aquafeed Ingredients for Rainbow Trout in Iran

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### Abstract

Iran as the largest producer of rainbow trout in the world needs sustainable aquafeed resources to fulfil the needs of this growing industry. Therefore, the potential feed ingredients were evaluated in fish feeding trials for their suitability and use in aquafeeds before introducing them into the market. The fish growth performance and apparent digestibility coefficients (ADCs) of nutrients were investigated for three fish meal free diets in comparison to a commercial diet and a casein-based semi-synthetic laboratory standard diet. Formulated diets were designed to meet the nutrient requirements of rainbow trout and have equal protein and lipid contents to commercial diet. TiO<sub>2</sub> was included as an indigestible marker to measure digestibility of experimental diets. Two-hundred-fifty-two juvenile rainbow trout with an initial average weight of  $30.3 \pm 3$  g were stocked randomly in 18 experimental 57-l rectangular glass aquaria for 72 days. The diets were allocated to the aquaria in three replicates in a random-block-design. Feces were collected via settling method for four weeks at the end of the experiment. The results showed daily instantaneous growth rate, weight gain, feed intake and feed conversion ratio did not differ significantly among the diets. The plant-and-animal-based diet had similar protein efficiency ratio (PER) and nitrogen productive value (NPV) to commercial and laboratory standard diets. Apparent digestibility coefficients for crude protein were considerably differed only between pure casein-based diet and plant-and-animal-based diet with the values of  $98.7 \pm 0.04$  % and  $90.7 \pm 0.29$  %, respectively. Our observations indicated that an acceptable performance could be achieved by applying poultry slaughterhouse by-products, canola meal and crystalline amino acids in carnivorous fish species without any fish meal and this may help to protect our planet resources such as demersal fish stocks in seas.

**Keywords:** Aquaculture feeds, Iran, plant proteins, rainbow trout, rendered animal products