Effects of Dietary Protein Level on Growth Performance, Muscle Composition, Blood Composition, and Digestive Enzyme Activity of Wuchang Bream (Megalobrama amblycephala) Fry

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Abstract

The purpose of this study was to determine the dietary protein requirement and effects of dietary protein level on growth performance, muscle composition, blood composition, and digestive enzyme activity in Wuchang bream fry. Five isonenergetic and isolipidic semi-purified diets were formulated to contain 28%, 30%, 32%, 34%, or 36% (dry matter) dietary protein. Diets were fed to triplicate groups of 25 fishes (16.08±0.03 g) to near satiation three times a day in a closed recirculation system for 10 weeks. Weight gain, specific growth rate, and feed conversion ratio significantly improved as the dietary protein content increased up to 34%. The protein efficiency ratio, hepatosomatic index, and viscerosomatic index significantly dropped as the dietary protein rose while the Fulton condition factor was positively correlated to the dietary protein level. Increased dietary protein resulted in increased muscle protein content and decreased lipid content. Red blood cell, hemoglobin, and hematocrit counts increased significantly with the increase in dietary protein. Serum triiodothyronine and thyroxine significantly rose as the dietary protein rose but serum aspartate aminotransferase significantly dropped. Intestinal protease and amylase activity rose significantly with the increase in dietary protein while lipase tended to drop. On the basis of broken-line regression analysis of weight gain and FCR, the dietary protein requirement of Wuchang bream fry is 32-33%.