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RESEARCH REPORTS

Sustainable Aquaculture for a Secure Future

Title: Effects of Diets Formulated with Native Peruvian Plants on Growth and Feeding Efficiency of Red Pacu (*Piaractus brachypomus*) Juveniles

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Abstract: We evaluated the effects of casein-based semipurified diets, alone or supplemented with native Peruvian plants, on growth, feed efficiency, and histology of the digestive tract of red pacu, Piaractus brachypomus, juveniles over an 8-wk feeding trial. Three tanks were randomly assigned to one of four casein-gelatin (40:8) diets containing a supplement of 15% wheat meal (control) or an identical level of substitution of three South American native plant as follows: camu-camu fruit (*Myrciaria dubia*), aguaje fruit (*Mauritia flexuosa*), or maca tuber meal (*Lepidium meyenii*). The fish (initial weight, 2.04 ± 0.06 g) were fed experimental diets at decreasing feeding rates from 4 to 2.6% of body weight. After 8 weeks of feeding, fish fed a diet supplemented with maca meal showed significantly higher ($P < 0.05$) weight gain, specific growth rate, protein efficiency ratio (PER), apparent net protein utilization (NPU), and instantaneous feed intake than fish fed other diets. Feed conversion ratio (FCR), PER, and NPU in fish fed the casein-gelatin diet supplemented with maca meal were among the best ever reported in the scientific literature, 0.64 ± 0.03, 3.13 ± 0.15 and 23.8 ± 2.0, respectively. The camu-camu meal had a negative impact on diet palatability and utilization, which resulted in slower growth. The stomach, intestine, pancreas, and pyloric caeca at the start and end of the experiment show normal differentiation and appearance of cells and tissues. The live parenchyma showed lipid infiltration and pigment accumulation in all samples at the initiation of the experiment and may be attributed to the period of decreased feed intake prior to the study. At the end of the study, similar histopathologies were recorded in all samples from the control and camu-camu

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groups. Normal liver histology (polyhedral hepatocytes with centrally located nuclei) was observed in tow of three samples from the maca group and all the samples from the group that was fed the aguaje-supplemented diet.

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