

Apparent digestibility coefficients of soya protein concentrate for pacu (*Piaractus mesopotamicus*)

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Fish meal (FM) is an important but not sustainable protein source for fish feeds. Surrogate protein sources for FM in aquafeeds include soybean meal (SBM). However, dietary SBM may carry negative effects on growth of fish resulting from anti-nutritional factors such as protease inhibitors, tannins, lectins, and non-starch polysaccharides. Fractionation of SBM yields a soy protein concentrate SPC, which has higher crude protein (CP) contents and lower concentration of anti-nutritional factors. It also contains traces of oligosaccharides and the antigenic substances glycinin and β - conglycinin; methionine and cysteine are the limiting amino acids in soy protein. Apparent digestibility of CP and energy of SPC for pacu was measured with the aid of basal, complex diet (28 % CP; 3000 kcal kg⁻¹ crude energy) added of chromic oxide (Cr₂O₃) as inert marker. Diets were formulated with refined feedstuff and processed by extrusion; test diet was obtained by replacing 30% of the basal diet with SPC. Juvenile pacu (63.34 ± 2.12 g) were fed twice a day to satiety and feces were collected by sedimentation in a modified Guelph system after the second meal three times for each treatment with an interval of one day between sampling. Fecal samples were dried at 45 °C before storage, ground with mortar and pestle and kept at - 20 °C until analysis. Apparent digestibility coefficient (ADC) of nutrients in feeds was calculated using the equation: $ADC_{diet} = 100 - 100 \times (Cr_2O_3 \text{ in feed} / Cr_2O_3 \text{ in feces}) \times (\% \text{ nutrient content in feces} / \% \text{ nutrient content in diet})$. Apparent digestibility coefficient of test ingredient was calculated using the equation: $ADC_{test \text{ ingredient}} = ADC_{test \text{ diet}} + (ADC_{test \text{ diet}} - ADC_{basal \text{ diet}}) \times (0.7 \times \% \text{ nutrient content of basal diet} / 0.3 \times \% \text{ nutrient content of ingredient})$. ADC of crude protein was 95.33% and energy was 96.77%, deemed high scores considering the utilized protein source. In general, plant proteins are not easily digested because they are encased in starch, preventing the action of digestive enzymes, but the ingredient evaluated in this study shows potential for pacu. SPC can replace FM in diets for salmon, trouts and shrimps in percentages of 20 – 40 %, 50 – 100 % and 40% respectively, showing that SPC can be cost efficient alternative to high quality proteins of animal origin.

Keywords: digestibility, protein quality, plant protein, soya protein concentrate, feeds, *Piaractus mesopotamicus*

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