



Impacts of Fishmeal-free Diets on Fillet Quality of Nile Tilapia, *Oreochromis niloticus*

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Abstract

The use of dietary alternative to fishmeal is becoming more common in aqua-feeds with parallel to rising demand and cost of fishmeal. In evaluating alternative ingredients for food fish, a great attention should be paid to the nutrient profile of resulting fish flesh, specially fatty acids and amino acid compositions to confer human health benefits of the resulted product. Therefore, the objectives of this study were to evaluate the effects of long-term feeding of fishmeal-free diets on growth performance and fillet quality of Nile tilapia in terms of amino acid and fatty acid composition and color. Five iso-nitrogenous diets including control diet with 10% fishmeal were prepared. The fishmeal was eliminated from the other four diets, by one of four corn co-products, namely high-protein distillers' dried-grains (HPDDG), distillers' dried-grains with solubles (DDGS), corn gluten meal (CGM), and corn protein concentrate (CPC). Duplicated group of 36 fish with initial mean weight of 21 g were fed one of the five diets twice a day to near satiety for 24 weeks. Fish fed the control, HPDDG, or DDGS diet had significantly higher ($P < 0.05$) growth performances than those fed the other diets. The dietary treatments did not affect the color, or amino acid composition of fish fillets. But the fatty acid composition was greatly affected by the dietary treatments. Total polyunsaturated fatty acid and total n-6 fatty acid levels were highest in the DDGS group followed by HPDDG. The total n-3 levels and n-3: n-6 ratios in the fillets of the control group were almost double when compared to corn-based dietary groups. This result suggest that complete fishmeal replacement with HPDDG or DDGS does not negatively affect the growth performance, fillet color and amino acid composition of Nile tilapia, but further improvement of n-3 fatty acid composition is necessary to ensure human health benefits.

Key words: *Amino acids, fatty acids, fishmeal, growth, tilapia*

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