

Partial replacement of fishmeal with sunflower cake and corn oil in diets for tilapia *Oreochromis niloticus* (Linn): effect on whole body fatty acids

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Abstract:

The objective of this study was to determine the effect of replacing fishmeal with high-fibre and low-fibre sunflower cakes (HFSC and LFSC) on whole body fatty acid composition in tilapia *Oreochromis niloticus* (Linn). Sex-reversed *O. niloticus* males with an initial weight of approximately $16\text{g} \pm 0.95$ (SD) were used. A control diet based on herring meal and soybean meal was formulated. Six test diets were formulated such that low-fibre (LF) and high-fibre (HF) sunflower cakes (SC) contributed 30%, 60% and 80% of the dietary protein, and the diets were designated as LFSC-30, LFSC-60, LFSC-80, HFSC-30, HFSC-60, and HFSC-80 respectively. All fish were held at 25–28°C. They were fed three times daily their prescribed experimental diets for 70 days. At the end of this period they were starved for 24 h and weighed. Five fish representing the average weight of each replicated group ($n=3$) were frozen in plastic bags at –22°C for determination of fatty acid composition. Fatty acids in the fish were significantly influenced by diet. Palmitic, oleic and linoleic acids were the most abundant fatty acids in both the diets and the fish. Linoleic acid (18:2 ω 6) was the most abundant fatty acid in diets based on sunflower cake. The levels of this fatty acid were also higher in fish fed diets with high contents of the sunflower cakes (LFSC-60, LFSC-80 and HFSC-80) (31.3%, 34.7% and 29.7% respectively) than fish fed the control diet (13.8%). Percentages of long chain polyunsaturated acids of the ω -3 family viz., docosahexaenoic (22:6 ω 3) and eicosapentaenoic (20:5 ω 3) were low in the diets and in the fish bodies. Fish fed the control diet had a higher level of 22:6 ω 3 than those fed the other diets. The possible implications of the preceding findings for human health will be discussed.