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**EFFECTIVE METHODS OF PROCESSING SOYBEAN PRODUCTS USED IN  
FORMULATING DIETS FOR NILE TILAPIA (*Oreochromis niloticus* Linnaeus)**

**BY**

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## **Abstract**

The increasing demand for the silver cyprinid (*Rastreneobola argentea*), an indigenous fish species to Ugandan waters by humans has pushed the fishmeal prices high; making its use in aquafeeds less achievable. This calls for immediate and deliberate efforts in a search for effective use of alternative protein supplements in fish nutrition. Worldwide, soybean meal is used as an alternative protein supplement to fish meal in aquaculture feeds (aquafeeds) but requires deactivation of the existing trypsin inhibitor factors that limit its effective utilization. Besides the long used toasting procedure, several other trypsin inhibition deactivating procedures are recorded possible but are not fully researched. If soybean is to be effectively used as an alternative to *R. argentea* as a fish meal, low cost trypsin inhibition-free feed manufacturing procedures must be fully explored.

This study aimed at assessing the overall impact of the differently processed soybean based aquafeeds on the growth performance of Nile tilapia as a recipient fish species and the cost effectiveness of each product utilization. To implement this study, three experimental diets formulated using different processing methods of soybean namely: toasted and extruded, extruded without prior toasting and solvent extracted soybean cake were used as test diets on Nile tilapia grown for six months.

Growth of Nile tilapia was higher in groups fed on diet with soybean that was both toasted and extruded, followed by the groups fed on proportions of directly extruded full fat soybean based diet. These diets were also most efficiently utilized by Nile tilapia for growth. Groups fed on the diet in which solvent extracted soybean cake partially replaced *R. argentea* exhibited poor growth. Directly extruded soybean based diet was the most cost effective.

The use of solvent extracted soybean cake to partially replace *R. argentea* proved expensive with the lowest growth rate and highest cost of producing a kilogram (Kg) of fish. A combination of toasting and extrusion increased the production cost, but did not significantly increase growth rate compared to directly extruded full fat soybean based diet. These results suggest that direct extrusion of full fat soybean without prior toasting can effectively lower the activity of trypsin inhibitors and therefore be used in Nile tilapia practical diets in Uganda.