

## I. INTRODUCTION

Animal protein shortage for human consumption in Egypt faces a great problem; fish meat is considered one of the best animal protein sources for human nutrition. Raising fish is a main part subject in the map of nutritional security strategy in Egypt (El-waly, 1999). The fish with its high protein content ranks the top among all protein sources especially those of animal origin. Fish flesh is a highly nutritious and easily digestible protein as well as being of high use coefficient (Hussain, 1990)

In Egypt the potentialities of fish culture industry are great. This is due to the presence of the following natural resources: a) the long seashores bordering the north and east costs of the country, b) the long river Nile crossing the country from the high dam at south to the Mediterranean sea at the north, c) the numerous small branches making a large net of water stream either supplying the lands by irrigated or draining water, and d) some big lakes with brackish water scattered all over the country (Soha, 1994).

Tilapia is an important food fish in many tropical and subtropical countries. More than 20 species of tilapia have been cultured in developing countries, where animal protein is lacking. The most important tilapia species are *Oreochromis niloticus*, *O. mossambicus*, *O. aureus* and *O. galilae*. Among all culture tilapia species, Nile tilapia (*Oreochromis niloticus*) has emerged as the single most important species. The attributes which make Nile tilapia so suitable for fish farming are its general hardiness, ease of breeding, rapid growth rate, ability to convert efficiently

organic wastes into high quality protein, and good taste (**Yi et al., 1996**)

Tilapia culture has become more popular because of the relative ease of culture in a variety of aquaculture systems and because of favorable attributes as food fishes. Tilapia has become one of the most important fish species for fresh water culture.

The success of intensive fish culture depends to large extent on supplemental feeding, especially the dietary protein which is the most expensive component in the supplementary feed. Protein is responsible for large part of the cost of most prepared feed. Excess dietary protein will be used for energy and lead to an increase ammonia excretion. In addition, protein will be used for energy and not for growth when inadequate dietary energy is fed (**Prather and Lovell, 1973**). The supply of high quality fishmeal for use in aquaculture feeds has declined steadily during the last 10 year; leading to an increased price in fish production (**Bimbo and Growther, 1992**). High prices of this foodstuff are a great problem for various types of aquaculture, because fishmeal is essential for the preparation of the diets, which may represent 40-60% of total operational costs. Fish nutritionists have tried to use less expensive plant protein sources to replace partially or totally fishmeal. Soybean meal considered as one of the most usable ingredient of all plant protein foodstuffs (**Lovell, 1988**). However, growth has often been reduced in fish fed diets with soybean meal replacing all the fishmeal (**Reigh and Ellis, 1992**). One possible reason may be the activity of protease (trypsin) inhibitors in crude or in adequately heated soybean meal (**Willson and Poe, 1985**). However, this may not be of practical

importance since commercially available soybean meal usually has little trypsin inhibitor activity if adequately processed (Webster *et al.*, 1992). A second possible reason may be sub-optimal amino acid balance of soybean meal (Dabrowski *et al.*, 1989). A third possible explanation may be that energy content of soybean meal is lower than that of fishmeal in diets for fish (Viola *et al.*, 1983). Lastly, soybean meal may have reduced digestibilities of minerals especially phosphorus compared with fishmeal (Liebwitz, 1981).

Soybean meal can partially or totally replace fishmeal protein in the diets of most teleosts fish. This substitution mostly depending on processing technologies involved in soybean preparation and to the presence of various anti-nutritional factors such as lectinase, protease inhibitors, antigenic or estrogenic factors, oligosaccharides, etc. (Tacon, 1993).

**The aim of the present study is to find:**

- 1- The optimum percentage substitution of fishmeal with adequately processed commercially soybean meal in the diets of monosex *Tilapia nilotica* fish to decrease the feeding costs.
- 2- Growth performance parameters including body weight (g), body length (cm), condition factor, specific growth rate, feed conversion ratio as affected with soybean meal replacement.
- 3- Carcass qualities.