SUMMARY

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The present study was carried out at the laboratory of Aquaculture Research, Faculty of Agriculture at Moshtohor, Zagazig University (Banha branch). The aim of this study is to determine the optimum levels of protein and energy required for maximum growth of Nile tilapia, *Oreochromis nilotica* fry using different protein to energy ratio diets. Protein levels used in the present study were, 20, 25 and 30%, under three energy level for each protein level, 300, 330 and 360 kcal/100 g therefore nine diets were formulated and tested in eighteen aquaria (two replicates for each diet). Experiment still for 8 weeks from 15.7.2001 –15.9.2001.

Results obtained can be summarized as follows:

- At experimental start, average body weight (BW) as affected by protein level were 15.35, 15.40 and 15.33 g and body lengths (BL) were 9.70, 9.73 and 9.63 cm for fish fed diets with 20, 25 and 30% protein respectively with insignificant differences in body weight or body length. After two weeks, there were significant differences in BW and BL where the increase in protein level followed by significantly increase in BW and BL and the effect still until experimental end, while differences in condition factor (K) due to protein level were not significant.
- With respect to the effect of energy level in fish diets, at experimental start averages BW were 15.35, 15.37 and 15.33 g and BL were 9.65, 9.71 and 9.70 cm for fish fed diets with 300, 330 and 360 kcal/100 g diet, respectively with insignificant

differences in body weight or body length. After two weeks, there were significant differences in BW and BL where the increase in energy level followed by significantly decrease in BW , BL and K and the effect still until experimental end.

- With respect to the effect of protein / energy ratio in fish diets, at experimental start averages BW ranged between 15.22 - 15.50 g and BL ranged between 9.62 – 9.77 cm for fish fed diets with insignificant differences in body weight or body length. After two weeks, it is found that the diet contained 30% CP and 300 kcal/100 g gave the heavier BW and longest BL during the last 6 weeks from the experimental start. On the other hand the diet contained 20% CP and 360 kcal/100 g gave the lower BW and smallest BL during the last 6 weeks from the experimental. K values had no clear trend during all experimental periods.
- With respect to weight gain, increasing in protein, energy levels and P/E ratio had the same effect on body weight and body length.
- Increasing protein levels from 20-30% significantly increase specific growth rate. With respect to the effect of energy level in fish diets, the increase in energy level followed by significantly decrease in specific growth rate and this effect still during all the experimental periods. With respect to the effect of protein / energy ratio in fish diets, it is found that the diet contained 30% CP and 300 kcal/100 g gave the best values of specific growth rate and the diet contained 20% CP and 360 kcal/100 g gave the lower specific growth rates during most experimental periods.
- Increasing protein levels from 20-30% significantly improve feed conversion ratio, protein efficiency ratio and the diet contained 30% CP and 300 kcal/100 g gave the best values feed conversion

ratio, protein efficiency ratio and the diet contained 20% CP and 360 kcal/100 g gave the lower feed conversion ratio, protein efficiency ratio during most experimental periods.

- Results of carcass analysis show that, the increase in protein level in fish diets from 20-30% CP had insignificant effect on the carcass components except for flesh percentage which increased significantly with each increase in diet protein level. Also, increasing the energy content of diets had insignificant effect on all carcass components.
- Results of chemical analysis for whole fish show that, increasing protein level in fish diets from 20-30% CP had insignificant on the percentage of moisture, while protein and fat decrease significantly with each increase of protein in fish diets. Energy level in fish diets had insignificant effect on the percentage of each of moisture, protein, fat and ash in whole fish.
- Increasing protein level in fish diets from 20-30% CP significantly increased the percentage of protein and decrease the percentages of moisture, fat and ash while increase energy level in fish diets followed by increase the fat percentage in fish flesh.
- Percentages of protein and ash increased and percentage of moisture and fat decreased in by-products (viscera + skin + bones + head + scales + fins) with each increase in diet protein, while increase energy level in fish diets followed by increase the fat percentage and decrease protein percentage in fish by-products.