

5. GENERAL CONCLUSION

The experiment began with search for local feed ingredients, and with much difficulty since many factors were needed to be considered when formulating feeds for use in aquaculture. Nutritional value of the feed ingredients, easy availability and cost were the main factors in selecting the ingredients of one of the two treatments in this experiment. Quality factors i.e availability of crude protein, relevant amino acids and minerals from the feed ingredients as well as palatability, pelletability and simple storage procedures were also considered. With the help of the laboratories of Department of Veterinary services and the Institute of Postgraduate Studies and Research, proximate analysis of protein, amino acids, crude fiber, crude fat and ash content of the feed ingredients were completed.

In this study the feed compounded at the University (UF) was found to be better than the commercial feed (CF) with regard to growth, conformation, feed consumption and carcass characteristics. Although the two diets were isocaloric and had the same protein content, it is believed that the freshness of the feed ingredients in UF has made the above difference. Role of natural food in the ponds, however was not taken into account but no difference between two diet groups were assumed.

Growth performance from the three strains (*O.niloticus* local, *O.niloticus* philippines and *O.mossambicus*) during the period of 10 to 32 weeks of age showed both *O.niloticus* were better than *O.mossambicus* when fed with UF, as well as CF. Many other studies reported fast growth of *O.niloticus* compared to *O.mossambicus*. From this study it is also revealed that in studies involving genotypes and diet for fish, consideration should also be given to the possible impact of genotype and

environment (G x E) interaction in *Oreochromis* spp. Interaction effect of diet x strain in this study was significant for body weight, body conformation traits and feed consumption but not for feed conversion ratio.

Significant strain differences indicated that, *Niloticus* strains are better than *mossambicus* because there had been proper management of *Niloticus* strains in Malaysia and for a limited period, mass selection for improvement in *O.niloticus* has been practiced in University of Malaya farm.

Besides effect of strains and diet, differences in size and growth rates between studies may also vary due to different management factors such as space, feeding regime and water quality (pH, ammonia content and dissolved oxygen) and the genetic factors such as genotypes, strain etc. Effect of water quality are required to be studied in detail to see their influence on growth of fish. If the water quality is bad the growth performance of fish also will be retarded, because with lower water quality parameters, the growth of algae, other phytoplanktons and zooplanktons are also retarded. In this study space given to tilapia in different cages was less variable, therefore in the future study the effect of space in addition to the effect of strain and diet should be concurrently studied.

Carcass composition was measured separately for males and females from three strains in tilapia and the results showed that *O.niloticus* strains were better than *O.mossambicus* for many carcass traits. Dietary protein quality and quantity influence growth and carcass traits provided that other physiological requirements needed for growth and carcass composition are fulfilled. In general carcass composition of three strains showed difference when fed with two diets. Carcass composition of

strains fed with UF was better than or same compared to similar performance with CF. To obtain proper difference between strains, between diet and between sex, another experiment with bigger sample size is needed.

A diet with 20% crude protein and calorie: protein ratio of 150:1 has been considered in this study. This is in general agreement with most of the previous studies in tilapia, however, to obtain further growth in tilapia, effect of a higher protein content and different calorie/protein ratio should be investigated. Cost of feed with higher protein content and calorie: protein ratio is also an important factor. With high density commercial tilapia ponds, it is of course worthwhile to investigate the effect of high density feed on growth and carcass traits.

This study certainly confirms the need for the use of local feed ingredients in the tilapia diet. There are also other types of local feed ingredients which are locally available such as cassava (tapioca) meal and brewers yeast that can be used in future. Optimum growth and standard carcass quality was found in this experiment for all the *Oreochromis spp* with the compounded feed in the University (UF). Further improvement of UF in future is therefore recommended.