

Development of Fishmeal using Knifefish *Chitala ornata*

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Introduction

Knifefish (*Chitala ornata*) is a freshwater fish introduced to Sri Lanka as an aquarium ornamental fish in 1980's (Gunawardena, 2007). They were introduced to wild habitats by accidental release and now found in the rivers and lakes in Colombo and Kalutara districts (Sriyananda, 2004). The predatory nature of the knifefish and its ability to spread fast has posed a threat to native aquatic animals in Sri Lanka, especially to endemic species. At present, knifefish is listed as one of the invasive alien species in Sri Lanka (Gunawardena, 2007). Due to their large size and predatory nature, they have lost demand as aquarium fish and they have no demand as food fish. Hence, in order to eliminate these fish from wild habitats a new use should be introduced which would encourage the fishermen to catch them. In this research the possibility of using knifefish to produce fishmeal which could be used as a protein source in fish feed was evaluated.

Methodology

Knifefish for the experiment was collected from Kalutara area. Large bones and skin were removed and flesh was sun dried for 4-5 days. Dried flesh was ground and sieved to produce fishmeal powder. Two experimental diets were prepared as treatment 1 (containing Peliyagoda fishmeal) and treatment 2 (containing knifefish fishmeal) using the trial and error method. Other ingredients used were wheat flour, soyabean meal, rice bran and fish oil. Both diets were formulated to contain 30-35%. Proximate analysis was done for the ingredients and the two diets. Feeding trial was conducted for 20 days using guppies (2.34 ± 0.24 cm), male and female separately. Three replicates were used for each treatment. Length and weight of the fish were measured weekly. At the end of the experiment Feed Conversion Ratio (FCR), Specific Growth Rate (SGR), weight gain and protein efficiency ratio (PER) were determined. Production cost of 1 Kg of each diet was calculated and compared. Statistical analysis was done using two-way ANOVA using minitab16 software.

Results and Discussion

Proximate compositions of the two diets are shown in Table 01. As shown by table 2 there was no significant difference between mean values of the two treatments with respect to FCR, SGR, weight gain or the PER. There was also no effect of the interaction between the sexes and the treatments on the above parameters ($P > 0.05$) according to the results of the two-way

ANOVA. Therefore, it is possible to use knifefish fishmeal as a substitute for Peliyagoda fishmeal in fish diets.

Table 01: Proximate composition of experimental diets

Component	Treatment 1 (%)	Treatment 2 (%)
Protein	33.30±0.34	35.29±1.74
Lipid	7.98±0.22	4.25±0.43
Moisture	2.34±0.42	2.27±0.16
Ash	22.05±0.10	15.82±0.23

Treatment 1- diet with Peliyagoda fishmeal, Treatment 2- diet with Knifefish fishmeal

Table 02: Mean values of the parameters

Treatment	Sex	FCR	SGR	WG	PER
Treatment 1	Male	3.46 ±0.40	1.82 ±0.41	0.05 ±0.01	2.3 ±0.29
Treatment 1	Female	2.00 ±1.30	1.71 ±0.52	0.05 ±0.01	1.8 ±0.11
Treatment 2	Male	2.61 ±0.33	2.28 ±0.33	0.06 ±0.01	2.2 ±0.98
Treatment 2	Female	2.00 ±1.10	1.95 ±0.06	0.05 ±0.00	2.7 ±1.14

FCR- feed conversion ratio, SGR- specific growth rate, WG- weight gain, PER- protein efficiency ratio

When the production costs of 1 Kg of each diet were compared, it was more expensive to produce the diet with knifefish fishmeal than with Peliyagoda fishmeal. This was due to the high cost incurred on the production of knifefish fishmeal. If the whole fish was used for the production of fishmeal instead of using only the flesh, cost of production could be reduced. However results of the proximate analysis showed higher ash content in Peliyagoda fishmeal (26.6±0.25) which shows that it contained higher amounts of impurities in contrast to the composition of knifefish fishmeal (7.55±0.07) which contained only the flesh of the fish.

Conclusion

Knifefish fishmeal and Peliyagoda fishmeal have similar protein efficiency ratios and similar effect on growth of guppy. Therefore it is suitable to be used as a protein source in guppy feed. Domestic production of feed using knifefish fishmeal by fishermen could be encouraged.

Reference

- Gunawardena, J. (2007). Knifefish a massive threat with an enormous appetite. *The Island* [Online]. Available: [http:// www.island.lk/2007/10/01/L1.pdf](http://www.island.lk/2007/10/01/L1.pdf) [Accessed 09.04.2014].
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