

## Short Communication

# Performance of Major Carp, *Cirrhinus mrigala* Fingerlings Fed on Rice Polish, Maize Oil Cake and Rice Broken

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### ABSTRACT

Performance of *Cirrhinus mrigala* fingerlings fed at the rate of 4% of wet body weight twice daily on maize oil cake (T1), rice polish (T2) or rice broken (T3) for six weeks was studied. The *C. mrigala* fingerlings gained highest average body weight (0.44 g) on maize oil cake followed by rice polish (0.33 g) and rice broken (0.3 g). The lowest feed conversion ratio (FCR) value (0.08) was for maize oil cake (T1) and highest (2.7) for rice broken (T3). The average body weight (g) was negatively and non-significantly correlated with FCR.

**Key Words:** Feed conversion ratio; *Cirrhinus mrigala*; Rice; Maize

### INTRODUCTION

The information of feed conversion ratio (FCR) on locally available ingredients can provide the basis to develop acceptable fish feed. The FCR expresses food consumed per unit weight gained by the body and has been variously termed as food quotient or food coefficient or growth coefficient (Borgstrom, 1961). FCR is a good mean to measure the output and profitability of feed applied. FCR values of various fish feed ingredients have been estimated for carps (Borgstrom, 1961; Chang *et al.*, 1983; Jhingran, 1991). Jhingran (1991) had also mentioned that value of conversion rate, besides depending upon the nutrient contents of feed, also varies with the method of presentation of food to fish and environmental factors such as temperature and dissolved oxygen.

Taking under consideration the importance of FCR, there is a need to evaluate the locally available feed ingredients for obtaining reliable data on rate of conversion of feed into the fish flesh. Therefore, the present study was undertaken to determine the FCR of maize oil cake, rice polish and rice broken in major carp, *Cirrhinus mrigala*.

### MATERIALS AND METHODS

The experiment was conducted to study the FCR of fed on maize oil cake (22.4% protein), rice polish (10.6% protein) and rice broken (7.6% protein) in *C. mrigala* fingerlings. The experiment lasted for six weeks. Fingerlings were kept in cemented tank for acclimatization for two weeks during which they were fed with rice polish. The experiment was run in six glass aquaria of 60 x 44 x 44 cm<sup>3</sup> dimension with 60 L water maintained in each. The three ingredients were maize oil cake (T1), rice polish (T2) and rice broken (T3). After acclimatization, 20 fingerlings were randomly stocked in each aquarium. The average

initial body weight of fingerling was 0.07±0.02 g. Two replicates were followed for each treatment. The feed was supplied at the rate of 4% of wet body weight of fingerlings twice a day. Dissolved oxygen and pH of water in each aquarium was maintained by changing water daily and by using air pump and were monitored by using Hanna dissolved oxygen and pH meter. The range of water temperature was kept at 26.9-29.8°C. Fingerlings were taken from each replicate on weekly basis after removing water from the aquarium. Body weight was recorded to observe the growth performance of fingerlings. Fingerlings were released in water immediately after weighing. The feed was stopped a day before the weight was recorded. The mean weight of fingerlings in each aquarium was calculated to workout the feeding rate for next week. The FCR was worked out according to Jhingran (1991).

The data on body weight and FCR were subjected to statistical analysis. The comparisons of mean values of various parameters were made by using analysis of variance (ANOVA) followed by Duncan's Multiple Range (DMR) test according to procedures described by Steel and Torrie (1986).

### RESULTS AND DISCUSSION

The results revealed that the effect of three treatments on average body weights of *C. mrigala* were statistically highly significant ( $P < 0.01$ ) being higher in T1 (0.22 g) followed by T2 (0.20 g) and T3 (0.19 g). The mean values of FCR among different weeks revealed that there was non-significant difference except in 3<sup>rd</sup> (1.71) and 4<sup>th</sup> (1.37) weeks where the difference was found to be statistically significant. The correlation coefficients ( $r$ ) between average body weight and FCR of three ingredients revealed that the correlation between two factors was negative and non-significant (Table I).

**Table I. Correlation coefficients (r) between average body weight (g) and feed conversion ratio (FCR)**

| Ingredients    | Correlation coefficients |
|----------------|--------------------------|
| Maize oil cake | -0.351                   |
| Rice polish    | -0.252                   |
| Rice broken    | -0.156                   |

The overall pattern of growth of fingerlings of *C. mrigala* remained highest for maize oil cake (T1) and lowest for rice broken (T3) as the protein contents of maize oil cake are higher than rice polishing and rice broken. The findings of the present study are in support of Qadoos (2000). He reported that *Labeo rohita*, *Catla catla* and *C. mrigala* gained higher body weight on maize oil cake as compared to rice polish. FCR was observed to be highest of rice broken (2.57) followed by rice polish (2.3) and lowest of maize oil cake (1.11). This means that a greater quantity of rice broken was required for a unit weight gain of fish. Whereas, maize oil cake was required in lower quantity for a unit weight gain of fish. The inference could be drawn that maize oil cake is more acceptable and efficient ingredient to increase the weight of fish as compared to rice polish and rice broken due to its higher protein value. These results were in accordance with the values reported by Das and Ray (1991). FCR increased with decreasing dietary protein upto 35% and decreased for diet with 55% protein.

The correlation between average body weight (g) and FCR values was non-significant and negative for the three ingredients. This is well in accordance with other results that less feed is required when its protein value is high for a unit mass gain giving low FCR value.

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(Received 02 October 2001; Accepted 22 December 2001)