

Growth performance of rohu, (*Labeorohita*) fingerlings by feeding of different quality of feeds

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Abstract

The effect of different feeds on growth performance of *Labeorohita*(rohu) fingerlings was evaluated in 60days culture trials. 25 fingerlings were maintained in well aerated 3x1.5-meter cemented tanks of 1.25-meter water depth. Three different feeds, rice bran+Oilcake as control (T 1); Abis 30/5 (T 2), Dayal 30/4 (T-3) were applied in different tanks of same stocking density. Fish were fed @ 3 % of their body weight twice a day at 12 hours interval for 60 days. Fish growth parameters (length and weight) were taken fortnightly. The amount of feed was adjusted according to the average increase in fish biomass in each tank. There was a remarkable increase in average body weight, FCR and SGR of fish fed with commercial feed Abis (T 2), Dayal (T-3) when compared with rice bran (T 1). These findings suggest that commercial feed will be feasible and good for obtaining optimum growth in rohu.

Keywords: Commercial feed, homemade feed, growth performance, fingerlings

Introduction

The weight gain of fishes under different culture system and feed quality is depending upon quality and quantity of feed provided to them. The availability of balance feed and their optimum use is one of the constraints of fish farmers. The growth of rohu fingerling varies with quality and nutritive value of feed provided to them. Different protein and fat content with vary composition directly affect the growth parameters like weight gain, length and FCR. *Labeo rohita* is an important freshwater fish species normally cultured in Asia particularly in the Indian subcontinent (Khan, *et al.*, 2004) [1]. The *Labeo rohita* fish species are widely grown in the Indian environment. Rohu is highly delicious and prestigious fish species among other Indian major carps (FAO (2000). The use of commercial feed has become inevitable for the success of cyprinid culture under intensive culture conditions particularly rohu along with other carps (Abid and Ahmed, 2009 a). The Indian Major carps are an important freshwater fish species normally cultivated in Indian environment. The fast growth in world human population has created a problem of food availability in the world. Protein supply significantly depends on fish and fish products in general. The aquaculture development and increase in per unit volume of water depends upon the use of high quality and balanced artificial feed (Shaheen, *et al.*, 2000) [3]. Fry culture under different feeding conditions is the need to produce optimum fish fingerling growth within a stipulated time period.

Craig and Helfrich (2002) [4], presented that in fish farming about 40-50% production cost comes on nutrition and feeding management. Probable cause of high feed cost associated with fish production has been solved by use of cheaper ingredients as protein sources. Another approach to reduce feed cost is to develop appropriate feeding management strategies and improvements in cultivation practices. Keeping in view the economic importance of fish feeding, present study was carried out to determine the

growth efficacy and survival rate of rohu fingerling evaluated under feeding regimes of different quality of feed like Abis 30/5 and Rice bran: oilcake combination.

Materials and methods

The trial was conducted at Fish production unit of Tulsi Krishi Vigyan Kendra, Chitrakoot, UP. Mono culture of fingerlings of rohu, *Labeorohita* measuring of mean initial body weight 7.35 ± 0.02 g obtained

gm measuring the total body length of 10.5 cm were collected from a Fish Seed rearing unit at Gniwan, Chitrakoot, UP. All fish were acclimatized prior to experiment for two hours in a hapa. Twenty-five fingerlings were kept in each tank. Three different feeds: rice bran+Mustard oil cake (T 1) as control, Abis (T 2), and Dayal (T-3) were purchased from the local market. At the time of fish stocking the total average wet body weight of 25 fingerlings of each tank was 148.82 gm. The water quality parameters like temperature, 27.35-27.4°C, pH 7.03 – 7.20, total alkalinity 386.1-407.4 mg/l, hardness 198.0 – 210.0 mg/l and dissolved oxygen 8.25 – 8.7 mg/l were maintained throughout the experimental duration in all treatment tanks. The tank is made of cement concrete of 3x1.5x1.5 meter size (6.75 cum). The fingerling was stocked at the rate of 50000 individuals per hectare after proper conditioning. The fingerlings were weighed (g), measured for total length (cm) and released into tanks. Fish were fed @ 3 % of their wet body weight twice a day at morning and evening hour (at 9 am and 5 pm) for 60 days. The increase in biomass was calculated fortnightly for each treatment and the quantity of feed was adjusted according to the biomass increased for all treatments. The quantity of feed utilized during the entire culture period and biomass gained were analyzed. The feed

used in the trial were analyzed and their ingredients and proximate composition are given in table 1.

At the end of the experiment, total weight gain, total length, Feed conversion ratio, Specific growth rate and survival were calculated.

Result and discussion-

The water quality parameters in fish culture system plays key role in fish production. The water quality parameters such as, pH, temperature, dissolved oxygen, total alkalinity and total hardness were similar for all the treatments. The water quality parameters were optimum and within the range for rearing of *Labeo rohita* fingerlings. Water temperature ranged between 27.35 – 27.4°C. Dissolved oxygen concentration found within the range i.e 8.25-8.7 mg. l-1. The pH ranges in between 7.03 – 7.20 and total alkalinity remained in the range of 386.1-407.4 mg/l, The total hardness concentration remained 198.0 – 210.0mg/l respectively which is presented in table 2, which are congenial in range for fish culture under controlled conditions (Ali, *et al.*, 2000; Boyd, 1982; Jobling, 1994; Woyanovich and Horvath, 1980) [5, 6, 7, 8]. The growth parameters for *Labeo rohita* fingerlings in the different treatments (control and treatment) in terms of mean body weight gain, mean length gain, SGR % per day, FCR, Survival (%) were calculated and are shown in table 1. The results obtained from the feeding trial indicated a varied growth rate under all treatments. The Indian carp culture sector has merely used pelleted feeds because of the unavailability of feeds and higher cost, this trial gives the valueability of the local available feed ingredients in fisheries sector.

The growth parameters for *Labeo rohita* fingerlings in the different treatments (T1, T-2 and T-3) in terms of mean body weight gain, mean length gain, SGR % per day, FCR and Survival were calculated and are shown in table 1. The results obtained from the feeding trial indicated a varied growth rate under different treatments. T-2 showed highest (2.76%) growth rate among all treatments than those of T-3 (2.56%) and T-1 (1.85%). Fingerlings reared with different feeds attained mean final lengths of T-2 (22.66 Cm), T-3 (21.90 Cm), and T-1 (15.75 Cm). Garg, *et al.* (2002) [10] stated that the better results for *Labeo rohita* as compared to *Cirrhinus mrigala* when fed with similar diets. Khan, *et al.* (2003) [9] has reported contrasting results and considered the high cost based diet (fish meal) as more effective for the better growth of *Labeo rohita*. However, Garg, *et al.* (2002) [10] reported better results for *Labeo rohita* as compared to *Cirrhinus mrigala* when fed with similar diets to that used in the present study.

Lower FCR were found in both formulated diets. The high FCR values recorded in farm made feed prepared with plant based diet that is 2.10 having approximately 21.5 % CP, the lowest FCR obtained was 1.35 by feeding of Abis 30 CP and 1.50 by feeding of Dayal 30 CP which are similar to the findings of Saeed *et al.* (2005) [11]. Fish fed on plant diet (30% CP), it resulted in a significantly higher FCR than fish and fed on animal protein (30% CP) reported by Li *et al.* (2000). Left over feeds and fish fecal matter accumulated in the tank, were regularly washed out to maintain water quality conditions in congenial range. At the end of trail, 2/3 water was drained out from the tank and all the fish

fingerlings were harvested and counted from each tank to calculate survival rate and final weight has been taken to estimate body weight gain.

Formula for SGR-

$$\text{SGR (\%/day)} = 100 \times (\ln(W_2) - \ln(W_1)) / t$$

Where

- W_1 = Initial weight of biomass
- W_2 = Final weight of biomass
- t = Time interval over which growth occurs (days)
- $\ln$ = Natural logarithm

Table 1: Growth Performance

Parameters	T-1	T-2	T-3
Mean Initial weight	7.35	7.35	7.35
Mean Initial Length	10.5	10.5	10.5
Mean Final weight	22.25	38.51	34.22
Mean Final Length	15.75	22.66	21.90
FCR	2.10	1.35	1.50
SGR (%) daily	1.85	2.76	2.56
Survival rate	92	96	96

Table 2: Physico-chemical characteristics of water in fingerlings rearing system under different treatments

Parameters	T-1	T-2	T-3
Mean Temperature (°C)	27.35	27.4	27.38
Mean pH	7.03	7.18	7.2
Mean Dissolved oxygen (mg/L)	8.7	8.25	8.28
Mean Total alkalinity	386.1	406.3	407.4
Mean Total hardness	198	204.8	210

Conclusion

The results of the present study reveal that plant origin diet can efficiently replace high cost commercial feed in rohu fish completely. The economics of feeding, Commercial feed put excess burden due to its higher cost on fish farmers whereas farm made feed of plant origin can improve the economics of the fish farming sector except favorable growth response of formulated diets in culture system when farmer can able to bear expanses on commercial feeding

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