

Aqua-Internship Program
Asia Link project
Faculty of Fisheries

Bangladesh Agricultural University, Mymensingh

**EFFECT OF DIFFERENT PROTEIN LEVELS OF FRY FEED ON THE
PRODUCTION OF QUALITY TILAPIA (*Oreochromis niloticus*) FRY**



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Background

Tilapia (*Oreochromis niloticus*) are native to Africa, but have been introduced in many countries around the world. They are disease-resistant, reproduce easily, eat a wide variety of foods and tolerate poor water quality with low dissolved oxygen levels. In Bangladesh there are about 12 exotic species (DoF, 2008), Tilapia is one of them. The culture of Tilapia is very popular in our country because of its high market demand and growth performance it can be cultured in almost any type of water bodies, it grows to marketable size within short time and its survivality is also very high. In recent years tilapia culture has grown rapidly and at present, tilapia are cultured in many countries of the world. In response to the expansion of tilapia aquaculture, considerable attention has also been given to ensure a continuous supply of high quality tilapia seed. In Tilapia culture fry feed is very important because the quality of Tilapia fry depends on the quality of fry feed. Fry feeds generally contain higher level of protein because it is believed that the protein and energy requirements on a unit mass basis are much higher in the early stages of life. The highest relative weight gain is achieved in the fry stages and it is important to ensure that full growth potential is realized during this stage of development. The protein content of fry feed in our tilapia farms have not yet been standardized although some farms use feed having as much as 40% protein. The survival of fry in the farm is also low by feeding feeds of differential protein levels in different farms. So it is essential to recommend the appropriate protein level of fry feed for economic production of healthy fry.

Objectives

The specific objectives are –

1. Determination of growth performance of tilapia fry at different protein levels.
2. Determination of survival rate at different protein levels.

Methodology

For conducting this experiment following steps was followed-

Study area

The experiment was performed in a selected farm, Agro3 located at Trishal in Mymensingh district.

Experimental design

Tilapia fry was used as experimental fish. Tilapia fry was fed with diet of different (35%, 38.62%, 45%, 50%) protein levels. For each protein level three replications were used and fry were fed 4 hours interval during 24hours cycle.

Egg collection

Brood fish was kept in hapa set into the pond. Fertilization was occurred in hapa. After fertilization, fertilized eggs were collected from the mouth of female Tilapia.

Egg hatching

Fertilized eggs then were transferred in hatching tray for hatching and hatchling was collected for rearing in the hapa.

Yolk sac absorption

Yolk sac was absorbed gradually. After complete absorption or just before complete absorption the fry was ready to take first feed.

First feeding

After yolk sac absorption feeding was started by high protein content diet (viz 35%, 38.62%, 45%, 50% protein) mixed with 17 α -methyl testosterone. The interval between feeding was 4 hours. It was continued in hapa for 28 days.

Time Frame

Activities	Duration(July to September, 2010)
Feed formulation and preparation	15 th July to 25 th July
Hapa preparation	26 th July to 5 th August
Egg collection, Egg hatching, Yolk sac absorption	21 st August to 25 th August
First feeding with 35% protein content diet.	25 th August to 21 st September
First feeding with 38.62% protein content diet.	25 th August to 21 st September
First feeding with 45% protein content diet	25 th August to 21 st September
First feeding with 50% protein content diet	25 th August to 21 st September

Description

For conducting the experiment following steps were followed sequentially.

Feed preparation

At first feeds were prepared containing 35%, 38.62%, 45%, 50% protein from three ingredients such as fish meal, rice bran, wheat flour supplied by the farm owner. Before preparing feed, formulation of feeds was done by Pearson's methods, then those formulated feeds were analyzed for proximate composition at the Nutrition lab in the Department of Fisheries Faculty. The individual ingredients were also analyzed.



Fig 1. Feed preparation

The ingredients used in the preparation of feeds and their proximate chemical composition are given in table 1.

Table 1. Formulation and proximate chemical composition (%) of the experimental feeds

Ingredients	% Protein
For 35% protein	
Fish meal	14.77
Rice bran	12.14
Wheat flour	8.09
For 38.62% protein	
Fish meal	19.72
Rice bran	11.62
Wheat flour	7.75
For 45% protein	
Fish meal	28.48
Rice bran	9.90
Wheat flour	6.61
For 50%protein	

Fish meal	36.92
Rice bran	7.85
Wheat flour	5.29

These formulated feed were mixed with 70 mg/kg 17α -methyl testosterone and 100ml/kg alcohol. Then the prepared feeds were stored in the refrigerator for using during first feeding of tilapia fry.

Hapa preparation

Previously prepared hapa, 16 ft×6.5 ft×3.4 ft in the farm were washed by using bleaching powder. Twelve same size hapa were set into the pond by using bamboo stick and rope.



Fig 2. Hapa preparation

Egg collection

Fertilized eggs were collected manually from the mouth of tilapia broodfish previously stocked in hapa set into the pond. Then these fertilized eggs were transferred in hatching tray for hatching. After hatching yolksac were gradually absorbed from hatchling. It takes 3-4 days. After complete absorption the larvae were transferred in experimental hapa for giving first feed.



Fig 3. Egg collection and yolksac absorption

First feeding

For twelve hapa 14964 fry were released each having 1247 fry. First feeding were started from 25-08-10 and continued to 21-09-10. Same protein content diet were given in three hapa i.e. each application was repeated at three times. The interval between feeding was 4 hours.

Sampling

Within this feeding trial sampling was done twice first after 10 days and second one at the end of the experiment. After 28 days feeding trial fry were transferred into a big hapa set in another pond. At this time ready feed was given for 7 days. Then the fry were ready for sale to the farmers.



Fig 4. Sampling of fish and ready to sale fish

Table 2. Sampling of tilapia fry fed with feed at different protein levels

% protein	1 st time sampling (after 10 days)	2 nd time sampling (at the end of the fry rearing)
35%	10g = 173 fry	10g = 74 fry
38.62%	10g = 214 fry	10g = 90 fry
45%	10g =240 fry	10g = 98fry
50%	10g =245 fry	10g= 110 fry

Result and discussion

Table 3. Growth performance of tilapia fry fed with feed at different protein levels

% protein	Final Weight (g)
35	168.52
38.62	138.55
45	127.24
50	113.36

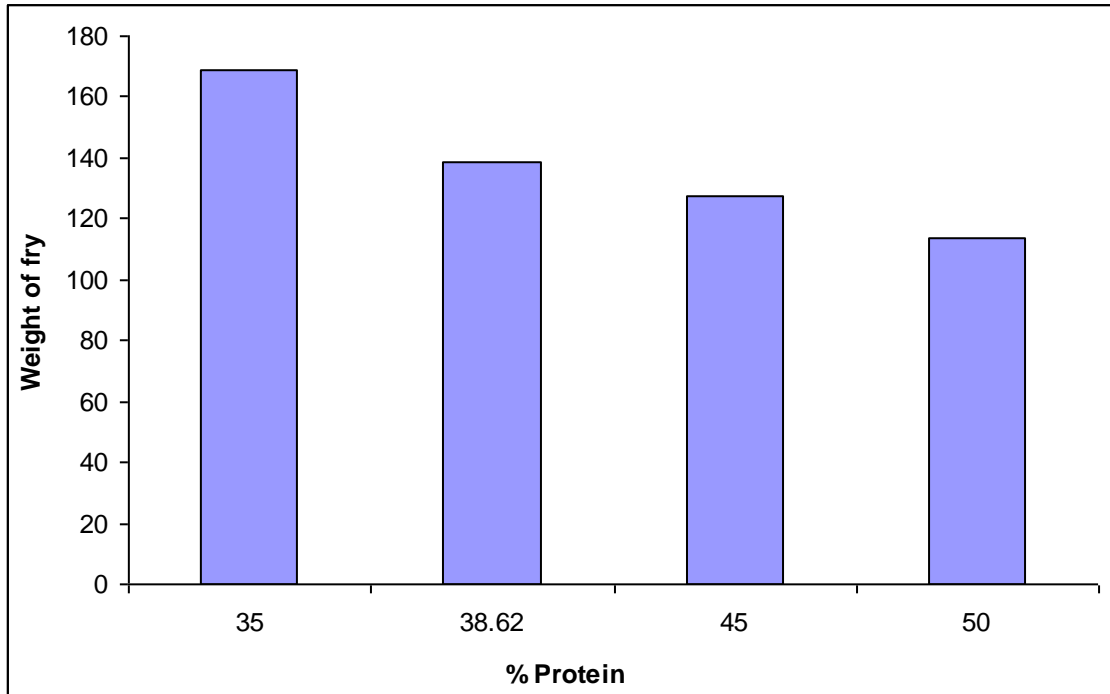


Fig 1. Growth performance of tilapia fry fed with feed at different protein levels

From the above it is clear that at low protein percentage i.e. at 35% protein the growth is better and with increasing protein percentage the growth rate is also decreasing. Normally we know that at high protein percentage the growth rate will be high but here it is not true. One reason for that would be the digestion problem. As the larvae are too small so they can not absorb the high protein diet. Other reason for that would be the percentage of other nutrient materials e.g. carbohydrate, lipid, ash, moisture. So it is not clear as these are not included in my experiment.

Benefit derived from my research

Both me and farm owner was benefited by performing experiment. There are many benefits which are given below

Benefits for myself:

1. During study period the farm owner was very cooperative for conducting my experiment.
2. Every stage of my experiment he gave some guidelines how to perform experiment.
3. Hatchery technicians were well skilled at field level, so I did not face any problem, all time they had helped me.
4. Transport problem is a great problem, but that problem was not a problem because most of the time I was carried to the farm by the farm owners car.

Benefits for entrepreneur:

1. He gained some theoretical knowledge from us although we are not well skilled at field level.
2. From the experiment result it was found that the result is not as usual. So the farm owner gain extra experience.
3. He also conscious about the protein percentage, i.e. how to obtain better quality seed from applying appropriate protein level in the diet.

Constraints

There were some constraints during conducting my research work ,which are as follows

1. The pond which was used for conducting my experiment was turbid due to bloom and mud.
2. The hapa used for the experiment was not strong enough so that some technical problem was occurred.

Recommendation

For better experimental condition the following recommendation should be followed

1. Pond should be well turbid allowed for fish culture.
2. If possible new hapa should be used for each experiment.
3. Farm technicians should be well skilled as they handle whole farm level activity.

From the above discussion it was found than dietary protein level significantly influenced the growth of tilapia fry and the best results were obtained with a dietary protein level of 35% protein. As the result seems somewhat abnormal so the replication of the experiment will be required. Further experiment should be conducted for the quantification of protein level at 35% and below. If the facts remains same then 35% protein should be used for rearing of tilapia fry.

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