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Evaluation of Meat Quality of Channa *marulius Under* Different Cultural Conditions.

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Abstract: The experiment was conducted for a period of 6 months to investigate the quality of the meat from *Chana marulius* in 2 earthen ponds (T1 and T2). Each pond was stocked at a rate of 30 *Chana marulius*. In T1, compost (cow dung) was added and inorganic fertilizers (nitrophos) on a weekly basis. In T2, tilapia fish was stocked as forage for *Chana marulius*. After the final harvest, samples were taken from the meat of experimental fish ponds and were studied for proximate composition. Presented data was obtained by statistical analysis using ANOVA and DMR tests. T2 showed the highest protein (17.50%), fat (2.50%) and ash (1.93%) contents. T1 showed less protein (15.75%), fat (2.25%) and ash (1.85%) contents. While the moisture (76.00%) and carbohydrates (2.07%) contents decrease in T2. T1 showed higher moisture (77.92%) and carbohydrates (2.23%) contents.

Keywords: *Channa marulius*, meat quality, fertilizers, tilapia

1. INTRODUCTION

Between the production of the food industry and the aquaculture industry is one of the key industries that play an important role not only in meeting the demand for meat and fish but also universally recognized as the fast-food industry growth is produced by more than 19 million tons per year of food meat by aquaculture (Baruah *et al*., 2004). The aquaculture industry Provide a high proportion of protein in the form of fish meal, which is taken as a food for humans. It is also a source of income in the economic rural areas of developing countries. It is a way to improve employment opportunities and income for the poor in developing countries. As a result of this, people are able to produce food for themselves (Suloma and Ogata, 2006; Soto-Zarazua *et al*., 2010). Fish contributes about 17 % of the supply of animal protein, but in many countries, people derive up to 50% or more of the total animal protein needs of the fish. Asia contributes 80% of the total fish production and is a candle in aquaculture products (Khan *et al*., 2002; Nazish and Mateen, 2011). Fish is an important source of animal protein. In Pakistan, the consumption of fish is very low. Unfortunately, did not work the fisheries sector in Pakistan to get attention. Pakistan also faces a high growth rate of the population, it is essential that Pakistan should take advantage of all the resources available to it from food. Availability of protein is much lower than the minimum daily requirements. We cannot compensate for this condition the animal protein and dairy sector alone. Fish meal is an excellent source of protein obtained by animals (Wasim, 2007). *Chana marulius* is common on a large scale also called the head of the snake or giant murrel or spirit. Tilapia are stored with the snakeheads because the snakeheads are strictly carnivorous, predator too because they swallow their prey whole , and has been shown to effectively control the live tilapia fry (Kaewpaitoon, 1992). Referred to the analysis of water, protein, fat and ash of the fish for the meat quality of fish. Analysis of live fish display the following results;

Water	70-80%
Protein	20-30%
Fat	2-12%

These values may vary depending upon the type of fish species, body size, sexual stage, feeding rate, time of year and activity. These contents may also vary in different organs and tissues (Ali *et al*., 2001).

2. MATERIALS AND METHODS

Pond 1 was treated with ammonium nitrate and polish rice and pond 2 with ammonium nitrate and corn gluten from @ 0.3 gN/100gm of fish body weight per day. Tilapia were stocked with *Chana marulius* as forage fish. After the final harvest, samples were collected meat from each experimental pond and frizzed to analyze the proximate composition of the farmed fish species in terms of moisture , crude protein , total fat , total ash and carbohydrates to study the effect of fertilization and the combination of tilapia culture on the quality of meat from *Chana marulius*. Displayed data obtained and therefore the statistical analysis (Steel *et al*., 1997). The comparison of various parameters

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was computed by using Analysis of Variance (ANOVA) and Duncan test the multiple (DMR) with repeated sampling .

Meat Quality of *Channa marulius*

At the end of the trial period, and the quality of meat from Chana marulius under the influence of fertilizer and calculated blend of tilapia culture in terms of body composition proximate.

Proximate Body Composition of Fish

Chana marulius were selected randomly from each pond. Viscera, skin and fins and tails, heads and bones of these fish limit were removed. After removing these parts, flesh fish was only analysed. Samples were analyzed for crude protein, moisture, total fat and total ash and carbohydrate contents of the body by the method provided by the AOAC (1984).

Crude Protein

The determination of crude protein was done by standard Kjeldahl method.
Crude protein percent = nitrogen percentage × 6.25

Moisture

The moisture contents were determined by taking meat sample in petri dish and placing in oven at 105^{o}C for 12 hours. The loss in weight after drying was recorded. The moisture contents were calculated by following formula:

$$\text{Moisture percentage} = \frac{\text{Loss in weight}}{\text{Weight of sample}} \times 100$$

Total Fats

Ether extraction method was used to calculate the total fats of fish through Soxtec 1045 system. Total fat percentage was determined by the following equation:

$$\text{Fat percentage} = \frac{W_2 - W_1}{\text{Wt. of sample}} \times 100$$

Where,
W_1 = weight of empty extraction cup
W_2 = weight of extraction cup with fat after evaporation

Total Ash

Total ash was calculated by taking 2 g of dried fish sample in weighted China dish. The sample was placed in muffle furnace for ignition at 600^{o}C. The ignition is carried out until white ash was obtained. Then it was cooled in desiccators and weight was calculated. The following formula was used to determine total ash percentage:

$$\text{Ash percentage} = \frac{\text{Weight of ash}}{\text{Wt. of sample}} \times 100$$

Carbohydrates

Total carbohydrates were calculated by following formula:
100 – (Crude protein + Moisture + Total fats + Total ash)

3. RESULTS

Proximate composition was carried out at the end of the experimental period. The results obtained are given below.

Moisture

The moisture contents in *Channa marulius* were calculated 77.92±1.31 and 76.00±2.83 % in T1 and T2 respectively.

Crude Protein

The crude protein contents of *Channa marulius* were calculated as 15.75±0.35 and 17.50±0.35 % in T1 and T2 respectively.

Total Fats

Flesh of *Channa marulius* had 2.25±0.32 and 2.50±0.34 % fats contents in T1 and T2 respectively.

Total Ash

In this experiment, *Channa marulius* showed 1.85±0.13 and 1.93±0.06 % ash contents in T1 and T2 respectively.

Carbohydrates

The carbohydrate percentage in T1 and T2 was 2.23±0.01 and 2.07±0.17 % respectively.

Table 1: Proximate composition of *Channa marulius* cultured under the influence of fertilizers and tilapia

Treatments	Parameters				
	Moisture (%)	Crude protein (%)	Total fat (%)	Total ash (%)	Carbohydrates (%)
T1	77.92±1.31	15.75±0.35	2.25±0.32	1.85±0.13	2.23±0.01
T2	76.00±2.83	17.50±0.35	2.50±0.34	1.93±0.06	2.07±0.17

4. DISCUSSION

Chana marulius carnivorous fish with the observed behavior of cannibalism in several studies (Rahman *et al*., 2011; Sonawane and *et al*., 2012). Ashraf and *et al*., (2011) reported that the carnivorous fish nutritional value always top of herbivorous fish. During the current experiment, it was observed that most of all the quality of the meat from *Chana marulius*

was better in T2 than in T1. Any statistically proximate composition, total fat, total ash and carbohydrates were not significantly different. Crude protein showed only a big difference. The observed higher values of crude protein, fat and ash in T2. These high values may be due to the availability of tilapia feed the offspring of the head of the snake. Stansby (1962) and Jirásek and *et al*. (1984) also reported the same results. protein contents of *Chana marulius* was found be higher than carp and tilapia. It also influenced the fertilization pond proximate composition of fish (Hassan and Jawad, (1999).

The moisture contents of carbohydrates and higher in T1. Applied only organic (cow dung) and inorganic (nitrophos) fertilizers in this pond and retain control of the pond. The tilapia off springs are not available in this therapy and the use of fish protein to own and operate the water took place in the muscles of fish and an increase in the moisture content of the fish flesh . There is an inverse relationship between the protein and moisture. Similar findings were made by Love (1980). The protein contents of the experiment from 15.75 to 17.50 % , which was almost equal to the results of Balaswamy *et al*., (2009) who examined the protein 16.6 % and Shaheen (1988) , who got 16.18 % of the protein in *Chana*. Qasim *et al*. (2009) for 2.5-3.5 % lipids *Chana striatus*, which was approximately equal to the proportion of fat in the contents of *Chana marulius* because of the same species. Moisture contents were higher in T2 were used organic fertilizers only , and was not available from the tilapia fish forage while it decreased in T1 where the fish are also available tialpia forage. The results were within the range provided by the Riad and Ahmed (2006).

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