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Tilapia- Low Cost! High Nutrient! Alleviate Malnutrition

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A B S T R A C T

Fish is an excellent source of protein to accomplish food demand and alleviate malnutrition problem to humans. A thirty days experiment was conducted in outdoor lined pond to evaluate the low protein feed utilization by GIFT tilapia. Tilapia encompasses 51.06 ± 0.46% of high quality protein (whole body dry weight basis) and essential fatty acids. Nutrient profile of tilapia indicated the low protein feed makes more economical.

Introduction

An eicosapentaenoic (EPA, 20:5n-3) and docosahexaenoic acids (DHA, 22:6n-3) are well identified fatty acids, significantly contributing in human nutrition and health (Harris *et al.*, 2009; Nguyen *et al.*, 2010). According to WHO (2018) report, more than 1/9 people were suffering from hunger in the world which cause malnutrition problem. To surpass nutritional deficiency problem, imperatively intensify the food supply sector. In this concern, aquaculture sector can fulfill the food demand. In that, feed cost covers maximum input in fish/shrimp farming (Avnimelech, 2007). Therefore, to conserve the feed budget, have to use of a digestible protein sparing energy source, such as carbohydrates and lipids. A satisfactory level of dietary carbohydrate and lipid could raise protein-sparing effect in many fish species (Azaza *et al.*, 2009).

Tilapia has been considered as "poormans protein" because it can serve as daily protein source for millions of people among the less

developed countries (Asian Development Bank, 2005; Yuvarajan *et al.,* 2018). It has enriched with vital protein and fatty acids, especially omega 6 and omega 3 fatty acids (Young, 2009). Tilapia is having omnivorous feeding habit, can effectively utilize dietary carbohydrates and crude lipids as energy source (Kamalam *et al.,* 2017). This kind of replacement of nutrients can significantly reduce feed cost as well as fulfil the present and future food demand

The present short communication paper covered the importance of tilapia farming with special reference to nutrient viability and economic feasibility to sustain the livelihood

Materials and Methods

A thirty days nursery experiment was conducted in outdoor lined pond (100 ton capacity) at advanced research farm facility, Madhavaram, Chennai-51. Genetically Improved Farmed Tilapia (GIFT) was stocked (Figure 1) at 50 numbers/m^2(0.2054 $\pm$ 0.02 g/seed). Commercial feed was given to fishes (Table 1). Trial was executed in duplicate. Proximate composition of commercial feed and GIFT tilapia (whole body of fishes in dry basis) was analyzed by following the standard method (AOAC, 1995). The data was statistically analyzed by independent t test using SPSS version 24.

Results and Discussion

GIFT tilapia (Whole body dry weight basis) nutritional composition was given in table 2. The remarkable increment of protein and lipid were observed at the end of the harvest, which is mainly due to the effective conversion of sparing nutrients from fish feed and natural productivity, this nutrients might be expressed into tilapia body in the form of viable protein and essential fatty acids. Similar suggestion was reported by Boonanuntanasarn *et al.,* (2019). Crude fibre intake was significantly decreased from commercial diet, this result showed the expression of fibre content not placed into fish body. Hence, no need to increase fibre content in fish feed, this source will jeopardize the feed intake of fishes. Instead of that, carbohydrate and lipid source might neutralize the protein sparing effect. Similar results were reported by Tran-Duy *et al.,* (2008).

Figure.1 Experimental fish (GIFT tilapia)

Table.1 Proximate composition of fish feed

Parameters	In percentage (Dry Wt basis)
Moisture	10.16
Crude Protein	16.75
Crude Fibre	17.39
Ether Extract	10.49
Total Ash	12.48
Gross Energy	3942 Kcal/kg

Table.2 Proximate composition of GIFT tilapia showed the nutrient viability

Proximate composition	GIFT whole body
Moisture (%)	5.06 ± 0.26
Crude Protein (%)	51.06 ± 0.46
Crude Fibre(%)	0.98 ± 0.01
Ether Extract (%)	28.13 ± 0.86
Total Ash (%)	9.50 ± 0.04
Gross Energy(Kcal/kg)	5793 ± 75

There are different fishes are available for consumers, fetching with different prices based on taste, nutrient profile, cost of production and demand/supply. Among the animal nutrition, tilapia contributes substantial role in human health which can supply high nutrients within minimum price. Future studies should focus on low cost feed technology, it should be reduce the feed cost, increase the fish production and alleviate the malnutrition.

In conclusion, the present study suggested that, low protein feed is sufficient to produce efficient production of tilapia with high nutrient. Remaining protein content can be spared by increasing carbohydrates and lipids content. Future studies should be focus on sparing of nutrients how much will neutralize the protein percentage for diet satisfaction of tilapia. Cost effective feed producing technology can satisfy protein replacement and alleviate hunger problem.

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