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NUTRITIONAL ANALYSIS OF NON-CONVENTIONAL FEED RESOURCE

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Nutrition is important factor influencing the ability of cultured fish to exhibit its genetic potential for growth and reproduction. They are greatly influenced by factors such as quality of feed, daily ratio, size, feed intake and physico-chemical parameters of water. The economic viability of the culture operation depends on the feed and feeding frequency. It means that nutritionally well-balanced diets and their adequate feeding are the main requirements for successful culture operations. Commercialized feed presented to cultured species is not only nutritionally well-balanced, but also readily ingested with minimum waste production and digested and assimilated in an expected manner. Fish nutrition has advanced dramatically in recent years with development of new, balanced commercial diet that promotes optimal fish growth and health. Hence in the present study blood of bovine animal and deoiled groundnut cake is used to formulate the feed in various combinations that is from 100% blood formulated feed to 100% conventional feed that is deoiled groundnut cake feed. The analytical results revel's that formulated feed is nutritionally rich as compared to conventional feed.

Key words : Nutrition, formulated feed, blood, groundnut oil cake.

INTRODUCTION

Feed and feeding are the most important factors influencing growth, feed utilization and tissue composition of the fish in intensive culture (Okumus & Mazlum, 2003). The most important criteria for fish feed are its protein and energy content. A ration with improper energy and protein ratio cannot be termed as balanced and economical. As per views of nutritionist plant protein sources are deficient in certain essential amino acids, have anti-nutritional factors and have low biological value. This is one of the reason why animal protein sources *viz.* meat meal, blood meal, fish meal, and feather meal are extensively used in fish feed production (Johnston & Coon, 1979).

Ever increasing cost of fish feed has made researcher's interest to be focused on reducing cost of expensive ingredients by alternative animal protein sources (Wee & Wang, 1987; Adeparusi, 1993; Keembiyehetty & Desilva, 1993; Faluroti *et al.*, 1998; Martinez-Palacios *et al.*, 1998).

Supplementary feeding has been successfully introduced in aquaculture practices to enhance growth. The success has stimulated intensive efforts to formulate inexpensive feeds. According to Pillay (1983) to develop nutritional diets from locally available ingredients, fish meal has been used extensively because of its unique nutrient specification, palatability and compatibility with the protein requirement of the fish (Watanabe *et al.*, 1997). However the increasing cost of fish meal and its uncertainty in availability has restricted its use as a protein source. Therefore it is need of time that alternative cost effective protein sources must be introduced in fish diets.

Due to increase in intensive culture practices of many fish species, there is corresponding increase in demand for more efficient feed preferably species specific feed

The nutrient quality of feed ingredient is one of the prerequisite apart from the availability for production of good quality food. The basic factor which cannot be compromised in choice of ingredients for feed formulation is "protein", hence it is imperative to evaluate nutrient composition of formulated feed. The present study was undertaken to assess the nutritional parameters in feed formulated from blood meal and deoiled groundnut cake.

MATERIALS AND METHODS

Preparation of feed : Blood of bovine animal (80gm) was collected from slaughter house and brought to laboratory. The ingredients like milk powder (60 gm), corn flour (20 gm), and egg albumen (70 gm) were added and mixed well. Agar powder (4 gm) was added as binding agent; turmeric (0.5 gm) and garlic (1 gm) was added for its antibiotic activity. The mixture was boiled and then cooled at room temperature. After cooling cod liver oil (3.5 ml), vitamin mixture of vitamin B complex (1 gm) and vitamin E (1 gm) were added. It was kept under refrigeration for 12 hrs. After 12 hrs it was squeezed over polythene sheet and dried at room temperature for 48 hrs. The dried nodules were crushed into small pellets then sun dried to avoid fungal infection, weighted and stored in the air tight bottle.

Following the above procedure all the feeds were formulated in the percentage composition of 25% (blood 25% + groundnut oil cake 75%), 50% (blood 50% + groundnut oil cake 50%), 75% (blood 75% + groundnut oil cake 25%), 100% formulated (totally of blood) and 100% conventional (totally of groundnut oil cake).

Experimental set up : The feed was analyzed for moisture (Shaw T.M. 1956), crude protein, crude lipid, crude fiber, and ash values. Crude protein (N* 6.25) was determined after acid digestion by Kjeldhal method (Ma,T.S. *et al.,* 1942), lipid after extraction with petroleum ether in a Soxhlet apparatus, dry matter after drying at 100-105°C for 24 hrs and ash after combustion at 550°C for 12 hrs. Gross energy values were calculated assuming the energy values of protein and lipid (NRC, 1993).

Table I : Analytical results of formulated feeds

S. No.	Parameter	Conventional feed 100%	Formulated feed			
			100%	75%	50%	25%
1.	Moisture (%)	6.16	5.6289	8.011	6.784	6.789
2.	Ash (%)	4.73	6.120	3.64	3.69	4.39
3.	Protein (%)	33.94	31.84	43.27	29.89	30.29
4.	Fat (%)	7.72	4.01	7.46	6,52	5.4
5.	Fiber (%)	2.28	6.05	8.8	6.2	2.4
6.	Carbohydrate (%)	44.64	52.34	18,8	52.18	51.478
7.	Energy kcal/100g	372.82	315.42	315.42	386.80	375.51

RESULTS AND DISCUSSION

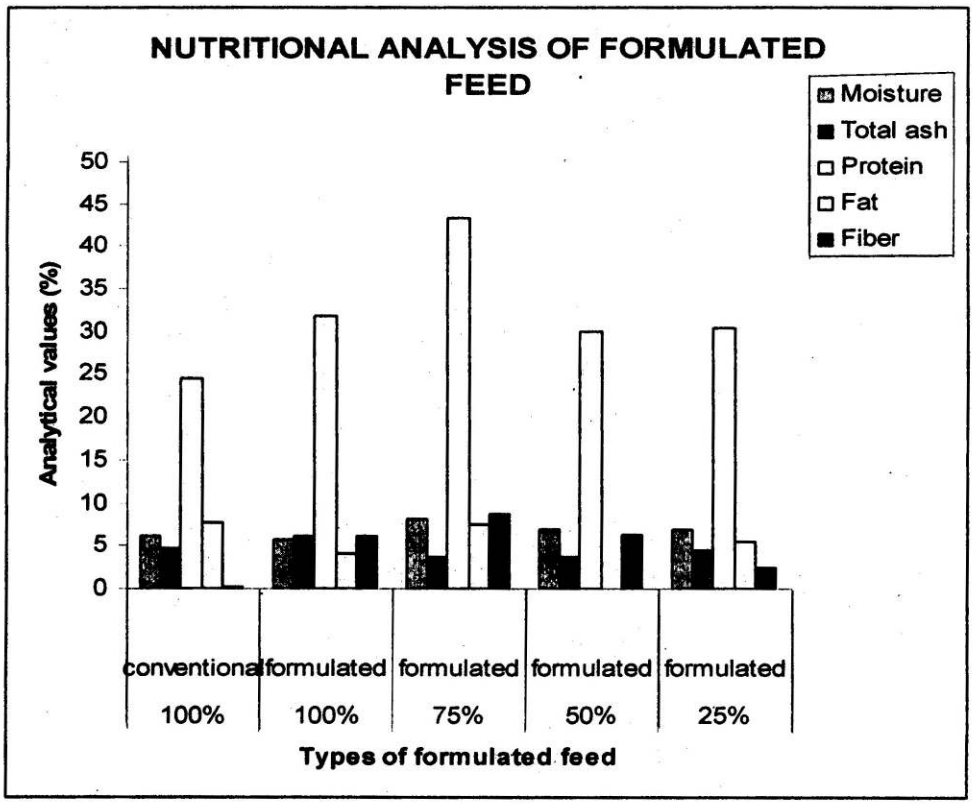

Fig. 1 : Graphical presentation of feed analysis of formulated feed.

Fish requires a well balanced mixture of Essential Amino Acids (EAA). They cannot be synthesized by fishes and often remain inadequate. EAA's are required for growth and tissue development of fishes. Blood meal has been reported to be a rich source of leucine and valine (NRC, 1993) as compared to commonly used fish feed commercially available in market; however blood meal is especially high in histidine and phenylalanine (Otubusin, 1987; Crockford, 1998; Hetrampf & Piedad-pascual, 2000; Hardy, 2006).

From the present studies it is revealed that, conventional feed contains 33.94%of protein while the formulated feed has 43.27% of protein. The total energy gained from formulated feed is 386.80 Kcal/100g while it is 372.82Kcal/100g for conventional feed. The formulated feed is nutritionally rich and preferentially consumed by the experimental fishes as compared to conventional feed. It is more suitable and acceptable for the growth of fishes and can be introduced as aqua feed.

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