



INTERNATIONAL JOURNAL OF PHARMACY & LIFE SCIENCES
(Int. J. of Pharm. Life Sci.)

**Fundamentals on the Nutritional Components in Fish Feed
for Aquaculture: A Review**

Subha Ganguly* and Purushotam Kumar

Department of Fish Processing Technology, Faculty of Fishery Sciences,
West Bengal University of Animal and Fishery Sciences, Kolkata, (WB) - India

Abstract

The nutrient requirements for fish mainly depends on the rate of growth of the fish in conjunct with additional influences like size, metabolic function in addition to the environmental influences and management strategies employed for rearing and breeding. However, for preparing and formulating fish feed the economic aspect of each and every ingredient needs to get proper priority as it is well known that appreciable amount of nutritional loss occurs during processing, heat treatment and storage.

Key-Words: Fish, Management, Nutrient

Introduction

Diet for the fishes containing adequate nutritional ingredients should be formulated as to contain all the essential components which should be balanced and adequate for the proper maintenance of growth, reproduction and overall health of the fishes. It should be devoid of the harmful antinutritional factors (including mycotoxins majorly, aflatoxicosis, ochratoxicosis and zearalenone) which deteriorate the quality of the diet. The formulated diet should be well acceptable to the fishes and should not pose any adverse effect on their habitat or water system (Gatlin and Poe, 1986).

Requirement at different stages of growth

Fishes have varying nutritional requirement depending on their growth phase i.e. from larval, fishling, spawning and up to table fish stage. During the period of maximum growth, the requirement for potential nutrients also rises (Cowey, 1975). The nutritional requirement among various fish types vary as per their habitat from freshwater to brackish water and to the marine system (Garling and Wilson, 1976).

Role of optimum availability of proximate principles

In the diet formulation for fishes, the protein finds the upper hand as the most important proximate component in the diet. The overall digestion coefficient of the diet depends on the availability of quality protein source. The incorporation of protein in the formulated diets should be in optimum ratio with the energy component present therein. Majorly, the protein component should consist of all the essential amino acids (Cho and Kaushik, 1985). The energy presence in the diet varies according to the size of the fish species as it is met up by the presence of carbohydrate content (Cho and Kaushik, 1990). The fatty acid content also varies linearly with it. The vitamin and mineral composition should be in conjunct with the major proximate principles present in the aquafeed. Availability of minerals varies among sources and fish species. Phosphorus digestibility in some feeds by the stomachless carp is much lower than that by channel catfish or rainbow trout. Availability of minerals from technical-or reagent-grade compounds will be higher and more consistent than from feedstuffs (Goldstein and Forster, 1970).

On the contrary, excess fortification with vitamins and micronutrients beyond permissible limits may lead to some loss in the nutrient content majorly during feed processing. Amino acids, several vitamins, and inorganic nutrients are relatively stable to heat, moisture and oxidation that occur under normal processing and storage conditions. Some of the

* Corresponding Author

E.mail: ganguly38@gmail.com

vitamins are subject to some loss, however, and should be used in excess of the requirement.

Metabolism. Vol.2. The Verteleratts, Campbell JW. ed. Academic Press, NY.

Conclusion

The nutrients in the aquafeed should be highly digestible to the fishes with high bioavailability. The feed should also have high storage life and losses due to physical and climatic factors should be minimum.

References

1. Cho, C.Y. and Kaushik, S.J. 1985. Effects of protein intake on metabolizable and net energy values of fish diets. pp. 95-117. In: Nutrition and Feeding in Fish, Cowey, C.B., Mackie, A.M. and Bell, J.G., eds. Academic Press, London.
2. Cho, C.Y. and Kaushik, S.J. 1990. Nutritional energetics in fish: Energy and protein utilization in rainbow trout (*Salmo gairdneri*). World Rev. Nutr. Diet. 61, 132-72.
3. Cowey, C.B. 1975. Aspects of protein utilization by fish. Proc. Nutr. Soc. 1975;34: 57-63.
4. Garling, D.L. Jr, and Wilson, R.P. 1976. Optimum dietary protein-to-energy ratios for channel catfish fingerlings, *Ictalurus punctatus*. J. Nutr. 106, 1368-75.
5. Gatlin, DM.III, Poe, W.E. and Wilson, R.P. 1986. Protein and energy requirements of fingerling channel catfish for maintenance and growth. J. Nutr. 116, 2121-31.
6. Goldstein, L. and Forster, R.P. 1970. Nitrogen metabolism in fish. pp. 495-515. In: Comparative Biochemistry of Nitrogen

How to cite this article

Ganguly S. and Kumar P. (2014). Fundamentals on the Nutritional Components in Fish Feed for Aquaculture: A Review. *Int. J. Pharm. Life Sci.*, 5(1):3221-3222.

Source of Support: Nil; Conflict of Interest: None declared

Received: 07.12.13; Revised: 15.12.13; Accepted:28.12.13