

FISH NUTRITION IN MALAYSIA: STATUS AND PROBLEMS

Zuikipli Talib

Fisheries Research Institute
Glugor, Pulau Penang, Malaysia

In aquaculture, nothing is more important than a well-balanced diet and adequate feeding. An undernourished fish is never able to maintain its health and attain its growth potential regardless of the quality of its environment. The production of nutritionally balanced diet for fish requires research, quality control, and biological evaluation.

The Department of Fisheries first acknowledged the importance of formulated feed when it established the Feed Section at the Fisheries Research Institute in Glugor in 1976. With the establishment of the research branch, Brackishwater Aquaculture Research Centre (BARC), in Gelang Patah, Johor in 1979 and the National Prawn Fry Production and Research Centre (NAPFRE) in Pulau Sayak, Kedah in 1987, the feed section has been expanded further to cover pond grow-out feeds for fishes and shrimps and the postlarval stage of shrimps. The feed section in Glugor placed greater emphasis on larval and postlarval feed. In the case of freshwater fishes, research and production of feeds began in 1975 at the Freshwater Fish Research Station, Batu Berendam, Melaka.

The development of formulated feeds is concentrated on fishes and crustaceans.

Status

Crustaceans. There are about 30 marine shrimp hatcheries operating in the country, producing an estimated 400 million fry a year (Ong et al. 1989). The first larval feed is usually in the form of live microalgae and this is introduced into larviculture tanks when the nauplii are about to metamorphose into protozoa. Newly hatched *Artemia* nauplii are next introduced at the late protozoal stage and this is continued up to PL 5 when formulated feeds are given. There are various types of imported formulated feeds available in the country such as Nippai, President, Yeaster, Frippak, Higashimaru, etc. In most cases, these are used as supplementary feeds. Research has been carried out to evaluate the effectiveness of each feed as a replacement for live food. It was found that artificial feeds could not totally replace live food but the combination of certain types of artificial feeds and live food gave better survival and growth (Utama 1991). Other studies have been done on artificial feeds for nursing postlarvae. NAPFRE was able to formulate artificial feeds which are equally

effective as the commercial feeds (Utama 1991).

There are also 563 shrimp farms (Annual Fisheries Statistics 1986) in Peninsular Malaysia, making up a total area of 475.77 ha. Most of the farms culture tiger shrimp (*Penaeus monodon*) and white shrimp (*Penaeus merguensis*). The estimated feed requirement is 2 t /ha/yr. Before 1985, the local market was dominated by Taiwanese feeds. After that, a few local feedmillers started producing shrimp feeds.

Since 1985, research has been carried out by the Department of Fisheries to develop a suitable feed for grow-out. But it was only in 1987 that BRAC produced a feed comparable, if not superior, to the imported feed (Chua and Nafiah 1988).

In the case of the freshwater prawn (*Macrobrachium rosenbergii*), NAPFRE has succeeded in producing a formulated feed for larval rearing called SUTIMAL (Zainoddin and Yaakob 1992). This feed proved to be good, significantly reducing cost and culture period, and giving higher survival rate. All the raw ingredients are locally available.

Fishes. Sea bass (*Lates calcarifer*) is one of the most important species cultured. It is rapidly expanding and production from ponds and cages in 1990 amounted to 1,953.4 t (Fishery Statistics 1990). This was 38% of the total production of fishes and shrimps from ponds and cages.

Cultured fish are solely fed chopped or minced trash fish. However, total dependence on trash fish has its own disadvantages. Natural marine resources are depleting, and supply is not regular especially during the monsoons. This causes fluctuating prices which increase production cost.

In 1986, BARC introduced its first formulated pellet feed for sea bass nursery and grow-out. BARC has also succeeded in producing a better formulated feed with an FCR of 2.0 (Ismail 1992). Although utilized in small amounts, formulated feeds for freshwater fishes are available in various sizes and form, that is, floating or sinking.

Problems

The development of formulated feeds in Malaysia has been hindered by a number of factors. One is lack of good quality raw ingredients. Raw ingredients have to be imported since local supply is too little or irregular to meet the demand. Quality of local ingredients does not also meet the standard. Price competitiveness is another problem. Fishfarmers have not totally accepted formulated diets, especially those produced locally. Although the aquaculture industry is developed to some extent, trash fish is still the main source of feed. Attempts to introduce formulated diets often fail because of its high cost and the limited exposure of fishfarmers to feed pellets. On the other hand, the importance of formulated feeds in shrimp culture has been realized and the demand for them has increased over the years. But this market is small and scattered, and commercial scale production is not profitable for local feedmillers. If feedmillers export their feeds, they face stiff competition from already established companies.

There are still some 114,000 ha of undeveloped land suitable for aqua-

culture, and 21,000 ha are anticipated to be developed by year 2000. There is, therefore, a great potential for the development of marine shrimp and fish feeds in Malaysia. Since one constraint in increasing local production of feeds is insufficient supply or non-availability of good quality raw ingredients, local suppliers can take advantage of the demand. At the same time, research by the government and private sectors to find alternatives or substitutes to imported ingredients can help the feed industry.

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