

Farmers' Perception of Critical Factors for Success of Indigenous Shrimp Feed in India

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The success of shrimp farming depends on adoption of cost effective and environment friendly technologies including feed. A study was conducted in two districts of Andhra Pradesh and one district of Tamil Nadu to assess the pattern of shrimp feed usage among coastal farmers. The findings revealed that the most important criteria for a good feed as considered by farmers were faster growth followed by water stability, low cost and good odour. Most farmers broadcast the feed from the dyke of ponds in both the states whereas farmers in Tamil Nadu practice feeding from boat also. Majority of farmers do feed rationing based on the bio-estimation of stock in the pond in Andhra Pradesh. Two-third of farmers in Tamil Nadu were found to purchase feed every week from dealers while farmers of Andhra Pradesh purchase the same with gaps varying from one week to four weeks. The major constraints reported by farmers in feed management were poor stability and escalating feed cost. The cost of feed and higher growth performance were found to be the critical factors for adoption of indigenous shrimp feed on the basis of assessment using Rank Based Quotient method.

Key words: Aquaculture, indigenous shrimp feed, critical factors, Rank Based Quotient

Feed contributes more than 50 per cent of total production cost in shrimp aquaculture. The quality of feed matters a lot in deciding the profitability of shrimp produce. Major players in aqua feed industry develop innovative products aiming to capture the market. Formulated feeds are expensive as most of the ingredients are imported and prices are going up continually. When fish meal becomes less economical to use, fish feed producers switch over to alternatives (Hardy, 2006). In order to alleviate high feed costs it is necessary to seek cost effective replacements to supply dietary protein from locally produced inexpensive materials (Millamena & Trino, 1997). The imported feeds are more expensive in spite of the duty relief given by the government compared to the indigenous feeds (Alagarwami & Ali, 2000). These exorbitantly priced feeds are beyond the means of the small and medium farmers (Devaraj *et al.*, 2000). Any new

intervention requires the support of vital stakeholders. Certain factors are likely to play a key role in either facilitating or promoting the entry of innovations including feed. These factors vary depending upon the nature of the product, consumer segment and its significance in contributing to the final value addition of the product and further stabilisation in the volatile aqua feed industry. Against this backdrop, a study was conducted to assess the farmers' perception and the factors influencing the promotion of new shrimp feed.

Materials and Methods

The study was carried out in Krishna and Guntur districts of Andhra Pradesh and Tiruvallur district of Tamil Nadu in 2008. The sample size for the study was 120 farmers drawn randomly. They were interviewed to ascertain the perceptions on existing feeds used by them and about the

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entry of new feed. The results were interpreted using percentage analysis.

In order to identify and quantify the critical factors affecting the entry of new aqua feed in the market, a structured questionnaire consisting of a set of parameters was developed and distributed to randomly identified 75 farmers, 27 researchers and 15 dealers as they were the major stakeholders for promoting / supporting any innovation on aqua feed. They were requested to rank the factors identified, based on the expert's judgement. The Rank Based Quotient (RBQ) was adopted to analyse the rankings for three different stakeholders. The order of merit thus given by the respondents was converted into RBQ value by using the following formula (Sabarathnam, 2002).

$$\text{Rank Based Quotient (RBQ)} = \frac{\sum [F_i (n+1) - i] \times 100}{(N \times n)}$$

where, F_i = No of respondents giving the particular point at i^{th} rank

i = i^{th} rank

N = Total no. of respondents

n = No of ranks or factors

The appropriate ranks were given based on the RBQ values.

Results and Discussion

The farmers' perceptions about their experience in using existing shrimp feed as well as their expectations are delineated in Table 1. The most important criterion for a good feed as considered by farmers was, the ability to promote faster growth. The water stability, low cost and good odour were reported as other criteria by one fourth of the respondents. The major scientific constraints reported by farmers in feed management were poor stability and estimation of

Table 1. Farmers' perceptions on shrimp feeds used

| Dimensions | Parameters | Districts | | |
|--|--|-------------------|------------------|----------------------|
| | | Krishna (n=52) | Guntur (n=48) | Tiruvallur (n=20) |
| % respondents | | | | |
| Reasons perceived for rating the best feed | Feed conversion ratio | 78.85 | 83.33 | 70 |
| | Good growth | 11.54 | 10.42 | 15 |
| | Cost effectiveness | 7.69 | 6.25 | 15 |
| | Less feed wastage | 1.92 | 0 | - |
| Criteria for good feed | Good growth | 75 | 66.66 | 60 |
| | Water stability | 13.46 | 20.84 | 10 |
| | Low cost | 7.69 | 10.42 | 20 |
| | Good smell | 3.85 | 2.08 | 10 |
| Constraints faced in feed management | Poor stability | 7.69 | 8.33 | 5 |
| | Estimation of right quantity of feed application | 5.77 | 4.17 | 5 |
| | High feed cost | 48.08 | 56.25 | 90 |
| | No response | 38.46 | 31.25 | - |
| Usage of any indigenous feed | Yes | 38.46 | 35.42 | - |
| | No | 61.54 | 64.58 | 100 |
| Readiness to use indigenous feed | Yes | 73.07 | 56.25 | 70 |
| | No | 19.23 | 25.00 | 20 |
| | No response | 7.70 | 18.75 | 10 |
| Expectations to promote indigenous feed | Credit supply | 73.07 | 62.50 | 45 |
| | Guarantee on growth | 19.23 | 25.00 | 35 |
| | Technical advice | 7.70 | 12.50 | 20 |

Table 2. Key success factors for indigenous shrimp feed based on RBQ method of ranking

| Key factors | Farmers (n=75) | | Dealers (n=15) | | Researchers (n=27) | |
|---|-------------------|------|-------------------|------|-----------------------|------|
| | | Rank | | Rank | | Rank |
| Competitive pricing | 92.148 | 1 | 90.370 | 1 | 88.066 | 1 |
| Higher growth performance | 89.185 | 2 | 85.926 | 2 | 79.424 | 2 |
| Farmer services and guarantees | 84.296 | 3 | 61.481 | 7 | 49.383 | 5 |
| Frequent quality counselling | 82.222 | 5 | 73.333 | 5 | 43.210 | 7 |
| Low marketing costs | 59.852 | 7 | 83.704 | 3 | 31.276 | 9 |
| Strong dealer network | 83.704 | 4 | 80.741 | 4 | 45.267 | 6 |
| Flexibility to make range of products | 59.111 | 8 | 59.259 | 8 | 62.551 | 3 |
| Skilled manpower availability at low cost | 36.148 | 9 | 54.074 | 9 | 36.214 | 8 |
| Quick response to market changes | 63.704 | 6 | 64.444 | 6 | 54.732 | 4 |

right quantity of feed. Escalating feed cost was also felt as major constraint in the face of dwindling profit margins.

About 35 to 38% of farmers in Krishna and Guntur districts of Andhra Pradesh tested and used indigenous shrimp feed while in Tamil Nadu none of the farmers used it. The Krishna district possessed three feed mills producing low cost feed using indigenous raw materials during the periods of shrimp farming boom. Although vast majority of respondents did not experience the benefits of indigenous shrimp feed, they expressed willingness to adopt the same on witnessing the worthiness of such feeds through demonstrations. They felt that such a low cost technological intervention would reduce the cost of shrimp production which would help the farmers in the long run.

Indigenous technologies have five major characteristics *viz.*, low capital intensity, sustainability due to environment and eco-friendliness, location specificity and limited adaptability, diffusion over small homogeneous zones and generation of only small increments in output and hence indigenous innovations create practically no visible ripples (Jha, 2008). A new product should possess the relative advantages of price and quality to penetrate into a highly volatile

market. Commercial farming operations should be tailored to be cost effective so that the intended market value for the final product can be obtained (Leung & Engle, 2006). Faster growth of shrimp was elicited as the second preference by all the stakeholders as the popularity of a particular brand lingers in the minds of farmers due to sustained performance in terms of both technical and economic indicators. Low marketing costs can substantially increase the dealer margin. However, visibility attribute of any new feed which penetrates the present volatile shrimp aquaculture field is absolutely essential and finally its contribution to profitable level of feed conversion ratio (FCR) was ranked as third preference by the farmers.

The perceptions of respondents *viz.*, farmers, researchers and dealers as elicited in their ranking of factors are presented in Table 2.

The researchers were interested to develop the technology which can produce the need based products including marketing conditions as they have given third rank, but it is not a major choice factor for farmers and dealers. Efforts are still required on providing feed management advisories which include optimum quantity of feed application

(which should reduce settlement of feed at the pond bottom).

Indigenous shrimp feed should possess better feed conversion ratio and water stability in order to compete with commercial feeds. Relative advantage in terms of price and quality of the new product along with high growth performance of aquaculture species emerged as critical factors for promoting the new indigenous aqua feed. Other factors differed with the needs and aspirations of different stakeholders. While dealers preferred low marketing cost, farmers showed interest on quality services and guarantees, and researchers expect the indigenous feed companies to respond to marketing conditions.

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