

*Review Article*

**BANANA SHRIMP (*FENNEROPENAEUS MERGUIENSIS*) CULTURE  
IN INDIA**

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**Abstract:** Consumption of marine animal protein sources has increased day by day, that suited to rear various marine species like fishes, shrimps, carps, etc in our country. Shrimp farming is the cultivation of marine shrimp or prawns for human consumption. In India, shrimp production has been followed till 2009 as monoculture system, thus it faced several disease problems. Recently this monoculture shifted into multi-culture by introducing exotic species. However, nowadays farmers are facing feed cost problems, brood stock and other conditions, which affect the shrimp culture production. So this paper deals with banana shrimp cultivation and their advantages (low cost for brood stock, ease in larval rearing and potentially low feed cost) over other species, which could reduce the current constraints, to some extent.

**Keywords:** Shrimp farming, banana shrimp, low feed cost.

## **Introduction**

India is the third largest aquaculture producer all over the world after China and Japan (Souza, 2016). Shrimp farming in India, till 2009, was synonymous with the monoculture of tiger shrimp (*Penaeus monodon*). Since from 2011 to 2015, shrimp culture production has significantly increased up to 31 percent than the other countries, because this monoculture system shifted into introducing exotic species like *Penaeus vannamei*. The advantage of this is the shrimp picked up on par with tiger shrimp in very short span of time. However, farmers facing major constraints like cost of feed (due to shortage/drastring changes in the cost of raw materials), brood stock and disease outbreak will affect the shrimp culture production (FAO, 2015).

So an alternative way to overcome these problems with some extent is by introducing new species which have the advantage of low cost for brood stock, ease in larval rearing and potentially low feed cost. *Fenneropenaeus merguensis* (Banana shrimp) is widely distributed in the Indo–west pacific region in both tropical and sub tropical water. It is important species for prawn fisheries and extensive prawn farming in South-East Asia and Australia (CABI,

2008; TNAU, 2014). Nowadays India is also establishing this species to reduce the overall cost of shrimp production.

### Shrimp cultivation

There are 3 phases in shrimp production of shrimp aquaculture.

Phase	Development stages
1 <sup>st</sup>	Reproduction and maturation for producing larvae
2 <sup>nd</sup>	Producing post larvae through hatchery
3 <sup>rd</sup>	Growing the adult stage of shrimps in ponds

### Soil type

Usually clay or loam based soil containing more than 90% clay and pH preferably 6.5 to 8.5 is suitable for shrimp cultivation. Ponds with sand or silt soil should be avoided due to their porous nature that may lead to erosion, seepage of water may occur. Mangrove or acid sulfate soils are not suitable for shrimp pond culture due to their high organic matter contents.

### Pond design and construction

Pond should be designed according to the characteristics of the selected site and culture system.

### Pond management

The excessive wastes, which accumulate in the pond during the previous crop, must be removed and the soil and water should be conditioned. Growing of shrimp in an improper pond may lead to difficulty in pond management during the culture period, which could result in a decrease in production capacity of the pond.

### Seed selection

S.No	Particulars	Requirement
1.	Size	Appearance of 4-6 spines on the rostrum, are recommended for stocking in a pond
2.	Morphology	Normal appearance of trunk, appendages and rostrum. The abdominal muscle must be clear, no discoloration
3.	Colour	Post larvae (PL) with the presence of pigment cells in the uropods should be used. PL that will have high survival and growth rates will be light gray, brown to dark brown and black in color. Pink or red colouration is normally related to stress.
4.	Behaviour	Healthy shrimp seed swim straight, respond rapidly to external stimuli such as a tap on the side of the basin
5.	External Fouling	Seeds should be free from external parasites, bacteria and other fouling organisms
6.	Pathogen free	Seeds should be checked for the presence of viral occlusion bodies. Seed with large numbers of occlusions indicates stress condition

### Stocking density

The stocking density between 10-20 PL/m<sup>2</sup> is usually practiced in semi – intensive culture. For intensive culture the stocking density should be between 25-30 PL/m<sup>2</sup>.

### Feeding management

Rearing shrimp in semi-intensive or intensive farming conditions require a basic knowledge about nutrition and the feed requirements of shrimp. Shrimp feed cost accounts about 50 to 70 per cent of total production cost and it will improve their production and increase profits. Nutrient content depends on raw materials used, formulation of diet, other conditions like storage conditions and feeding practices. Shrimp diets may be supplementary or complete. The shrimps need a complete diet if reared in an extensive system. Even though natural food items have good conversion values but they are difficult to procure in large quantities and maintain a continuous supply. Now a day's most of the aquaculture farms go for imported feed with an FCR (Food Conversion Ratio) of 1:1.5 - 1.8.

### Nutrient requirements

It requires 40 essential nutrients. These nutrients are provided in various amounts by natural foods and supplementary feeds. The nutrient requirements based on shrimp's size are showed in the Table 1 below (Lin, 1994 cite by TNAU, 2014).

**Table 1 Nutrient requirement of shrimp based on its size**

Shrimp size (gm)	Protein (%)	Fat (%)	Fiber (%)	Ash (%)	Moisture (%)	Calcium (%)	Phosphorus (%)
0.0-0.5	45	7.5	Max.4	Max.15	Max.12	Max.2.3	Min. 1.5
0.5-3.0	40	6.7	Max.4	Max.15	Max.12	Max.2.3	Min. 1.5
3.0-15.0	38	6.3	Max.4	Max.15	Max.12	Max.2.3	Min. 1.5
15.0-40.0	36	6.0	Max.4	Max.15	Max.12	Max.2.3	Min. 1.5

### Water quality management

Generally, shrimp farmers use dissolved oxygen, pH, ammonia, water color and odor as indicators to judge the water quality of the pond.

### Harvesting

The average culture period required is around 120 -150 days during which, the prawns will grow to 20-30 gm size. The best time for harvesting is early in the morning and it should be completed before mid – morning. Ponds and outlets should be approximately designed and it should be able to completely drain the pond within 4-6 hours. A bag net should be fixed to the outlet to collect the shrimp. When netting the shrimp within the pond either a small

electronic net or a large seine net can be used. The water level should be reduced to 0.5 -0.75 m deep and workers will need to go inside the pond for netting.

### **Time of harvesting and selling**

Depends on the condition of the shrimp grow in the pond and the market price. Harvested shrimp should be iced and transported to cold storage or processing plants in less than 10 hours.

### **Production costs and market value**

Depend on types of culture used, scale of production and number of production cycles per year. The cost of adult shrimp can range from Rs. 270-340 /Kg. The Indian shrimp has a relatively lower market value than *P. monodon*. Traditionally, the shrimp are exported as head-on, headless, tail-on or frozen in blocks. The profit can be increased by value addition to the shrimp in the form of shrimp pickles, cutlets, battered, ready to cook.

### **Conclusion**

In India, the brackish water aquaculture sector is mainly supported by shrimp production. Now monoculture system is shifted into the multi culture by introducing new species because of susceptibility to disease condition and also due to the shortage of feed raw materials. As we know the demand of marine protein sources has increased recent days so rearing new shrimp species like banana shrimp will yield more income and will be profitable.

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