

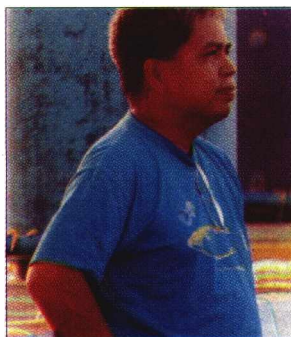
Producing and selling milkfish fry: the experiences of a government and a private hatchery

By **MB Surtida** and **AP Surtida**

Milkfish culture depends heavily on availability of fry supply which comes both from the wild and from hatchery production. But supply from the wild has been steadily decreasing through the years even as demand for fry has increased because of the intensification of grow out farming practices. This means that the milkfish hatchery industry must produce fry for grow out production as fast as the demand increases.

From 1980 to 1997, aquaculture registered a steady growth rate compared with the commercial and municipal sectors. Milkfish constituted the bulk of aquaculture production contributing 186,000 tons on average to total sectoral production. Compared with major fishery commodities, milkfish share of total aquaculture production was 29.65%, second to seaweeds and followed by tilapia. By year 2003, additional requirement for milkfish fry at 2.5% annual growth rate is 260 million. Can the milkfish hatchery industry produce enough fry to sustain production growth?

The following are observations of medium-scale milkfish hatchery operators and their experience regarding their fry production.



Director Westly Rosario greets the early morning sun at NCAMFRD with guarded optimism. In his short stint there, he has done wonders for the institution

NCAMFRD in Pangasinan

The National Center in Aquaculture and Marine Fisheries Research and Development (NCAMFRD) Complex — National Research and Development Institute (NFRDI) of the Department of Agriculture (DA) is a 24-hectare complex for fishery research, production, and training along the Lingayen Gulf in Dagupan City, Pangasinan in Luzon.

Among many of its major projects is the commercial milkfish fry and fingerling production.

NCAMFRD runs an integrated milkfish broodstock and hatchery complex. According to Mr. Westly

Rosario, the director of the complex, they have a 10 million fry target production up to year 2002. They are quite optimistic that this year they will produce more than one million milkfish fry. So far, this early, they have already produced about 60,000 fry. Their broodstock tanks contain breeders with a density of 75 fish per 100-120 tons.

In a report by Eva de Leon titled “Bangus hatchery goes into commercial production” published in the *Philippine Star*, 10 June



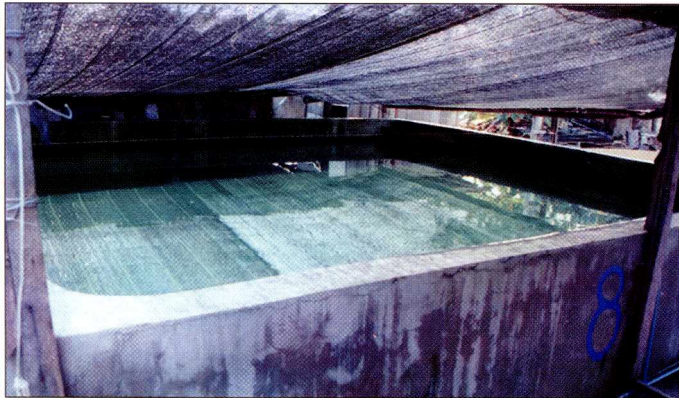
The National Center in Aquaculture and Marine Fisheries Resources Development (NCAMFRD) in Dagupan, Pangasinan has 10 grow-out seawater ponds. Priority is given to hatchery-reared milkfish



Technician Armando dulay feeding at larval tanks



Feeding time for hatchery-bred milkfish in one of NCAMFRD's grow-out ponds



The natural food circular tank (1) and larval rearing tank (2) at the Aznar milkfish hatchery in Talisay, Cebu

2001, NCAMFRD distributed about 200,000 fingerlings each in Regions 1, 2, 3, Davao, Zamboanga, and the Cordillera Autonomous Region (CAR). Fingerlings are sold at 20 centavos below the current commercial price.

NCAMFRD has three broodstock tanks with 167 breeders, both male and female. So far, there are 66 spawners now laying eggs. These spawners are domesticated milkfish coming from different places: Sual, Pangasinan; Tiwi, Albay; and Alaminos, Pangasinan. NCAMFRD researchers are waiting for the arrival of the Iloilo broodstock coming from the University of the Philippines in the Visayas (UPV).

NCAMFRD says spawners lay an average of 150,000 eggs each; fecundity is 200,000 per kg for each female breeder; and that spawning ratio of male to female is 1:1. The average age of the fish is five years and above. NCAMFRD has some 20-year-old broodstock from Alaminos, Pangasinan.

According to Mr. Rosario, spawners are given commercial feeds but these are reformulated by adding vitamins and fish oil.

NCAMFRD uses the flow through system in water management — 200% daily in water change. Another means of eliminating waste is by siphoning which is done three times a week.

Hatching has to be done in separate tanks, otherwise the adult ‘sabalo’ or spawners will eat the eggs that they laid.

For its hatchery facilities, NCAMFRD has incubation tanks for eggs, and ten 10-ton rearing tanks. The stocking density in the latter is 30 larvae per liter.

The hatching rate is 67%, and survival rate is 33%. Larval culture is 21 days prior to its release in grow-out fishponds. Larvae are fed with rotifer, starting day 2 to day 16. From day 16-21, they are given artificial feeds with cornstarch cooked like ‘polvoron’ (fine dust confectionery) with milk. Feeding is done once a day. At the grow-out pond, however, they are fed 3-5 times a day with commercial feeds.

NCAMFRD does daily siphoning of tanks to avoid rancidity of water due to uneaten feeds.

They don’t use *Artemia*. Instead, they use copepods as supplementary feeds which are collected from nearby fishponds.

With regards to diseases, Mr. Rosario has some suspicion that the possible source of deformities in fry is *Artemia*. But he has no empirical data yet to back up his suspicions. They have a collaborative project with the Marine Science Institute of the University of the Philippines in Diliman to study the genetic DNA sequencing of both hatchery-bred and wild spawners from different sources. The study is ongoing.

There are some abnormalities, according to technical aide Armando Dulay, like some fry exhibit exposed gills, or crooked bodies, but their Fish Health section is continuously studying these cases.

Other marine fish species being studied at the complex are: grouper, *Caranx*, seabass and siganid. But the extent of study is not as advanced as that of milkfish.

The Aznar hatchery in Cebu

The Aznar milkfish hatchery has been operating for four years and uses a hatchery technology that has been verified at SEAFDEC/AQD. It has several floating broodstock cages stocked with 400 breeders in Pangangan, Bohol. The cages (2 sizes, seven 10 and two 6 m dia, 3 m depth) are framed with polyethylene pipe and fiberglass at the top and bottom to retain its shape while in use. The cages were designed by Engr. Matias “Bombi” Aznar, an avid fish hobbyist, who says that his interest in fish as a boy prodded him to put up a multi-species hatchery to be able to “restock our seas” and arrest fishery decline.

Eggs from the broodstock (the cages are installed with egg collectors) in Bohol are transported to Talisay, Cebu for rearing. The Cebu hatchery has concrete broodstock (6 x 6 m), larval rearing (4 x 10 m), reservoir (10 x 10 m) tanks, and circular (10 m) natural food canvas tanks. Mr Aznar believes that one must have a nursery pond (he has 4 ha) to grow 21-day old larvae to fingerlings. His experience shows that it is better to grow milkfish to fingerlings in ponds before stocking them in cages. He sells his fry at P 0.40 - 0.50.



Engr. Matias “Bombi” Aznar intends to patent his floating broodstock cages in Pangangan, Bohol

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His broodstock are fed with commercial pellets while his larvae are fed *Chlorella* and rotifers, not unlike other commercial production methods. Survival from newly hatched larvae is 20 - 40%. Considering his number of breeders with the above survival rate, his average production can be modestly big and suggests surplus for the hatchery market. He sells fry to customers in Cebu and does not have a problem with acceptability. He explains that his Talisay hatchery near his buyers in Cebu and his breeders in Bohol can supply fry demand anytime.

But he assures us that his problem is not acceptability. It is overproduction. He steadily produces fry but he cannot sell them. His consultant, Albert Gaitan, says that at present, they have a million fry but there are no buyers. "Luzon is the biggest fry buyer, but unless we are able to pierce that market area, we would not be able to sell our produce. Our problem is not acceptability. It is the importation of fry from Indonesia and Taiwan that saturates the Luzon market," Totong says.

He further says that the Philippines should be exporting fry by now, and not allow importation.

"The bottom line of fry hatchery production is market, not acceptability," he says.

Conclusion

The above interviews and other conversations with hatchery producers show that the milkfish fry hatchery technology is now acceptable to most grow out milkfish producers. But hatchery producers say they cannot sell their fry despite intensive production methods now adopted by growout producers. They say that imported fry from Taiwan and Indonesia that floods the Luzon market should be regulated especially during peak months of wild fry availability. Added to this, they say that more processing plants for grow out production must be established. They believe that increased grow out production would invariably benefit the hatchery industry. The export ban on milkfish fry must also be lifted as the Philippines now has the capability to export especially during peak production months. It is ironic that a technology was expensively developed and pushed for acceptability only to cause frustration and losses to those who adopted it. ###

Update on BFAR's saline tilapia breeding

At the moment, there are two national programs in the development of saline tilapia in the Philippines -- the BFAR-FAC¹ project in Nueva Ecija and the Molobicus-NFRDI-NCAMFRD² project in collaboration with PCAMRD³ in Dagupan City. The hybridization of two tilapia strains, *Oreochromis niloticus* and *O. mossambicus* is being studied at NCAMFRD to come up with a first generation hybrid (F₁) that is fast growing like the *nilotica* and high saline tolerant like the *mossambica*.

According to Mr. Westly Rosario, director of NCAMRD, the F₁ hybrids can survive and grow at 15-25 ppt. The Molobicus Project Protocol, which is the title of the study, is aimed at the breeding of hybrid nursery and sex-reversal of the fingerlings.

Breeding of hybrids is done in concrete tanks or hapa nets with 1-3 x 5 x 1 meter specification. It is estimated that in about 45 hapa nets, 10,000-20,000 eggs or fry can be harvested every 10-20 days. The fast growing *O. niloticus*, otherwise known as GET, GIFT, *pla-pla* or giant tilapia, can be purchased in different areas of the country. This strain has a thick flesh, small head, is voracious, and easy to breed.

Sexually mature males weighing 50 g should be used in hybridization. Acclimation is done by letting species loose in concrete tanks or hapa. Aeration is done if necessary.

On the other hand, *O. mossambicus* females which are sexually mature should be caught and selected from many milkfish ponds to be used as parents of the F₁ hybrid. They are acclimatized by adjusting the salinity of the pond where they were caught.

Breeding is done in freshwater, that's why *mossambicus* should be acclimatized with decreasing ppt everyday (1-3 ppt). Needed are clean water, aeration, and feeds for the female parent. Breeding is done among 30 female *mossambica* with 10 male *nilotica* in 1.3 x 5 x 14 hapas. Same-sized tilapias should be matched. This matching is called MONI or *Mossambica* and *Nilotica*.

Harvesting of eggs is usually conducted during the summer months or warm weather. Harvesting is done by separating the breeders from the eggs by using scoop nets. The eggs are released in concrete tanks. Meanwhile, sac fry should be placed in an incubator. Incubation should last until the fry can swim.

