



IN THE SOUTH

Milkfish industry practices



The Sarangani Bay area where the action is now in *bangus* world class processing

By **MB Surtida** and **RY Buendia**

Like most industries, the milkfish industry in the Philippines started in small, divided groups, some merely into collecting wild fry, others grew them in ponds, and still others deboned and smoked some pieces for a few selected customers. These have greatly changed. Today, the milkfish industry has progressed into the assembly line type of production where breeding, hatchery, grow-out, and post-harvest processes are done under one roof, thanks to advances in technologies generated from research and the infusion of the Taiwanese intensive method of culture.

This report will discuss some practices of the *bangus* industry from interviews with pond, pen, and cage operators in southern Philippines.

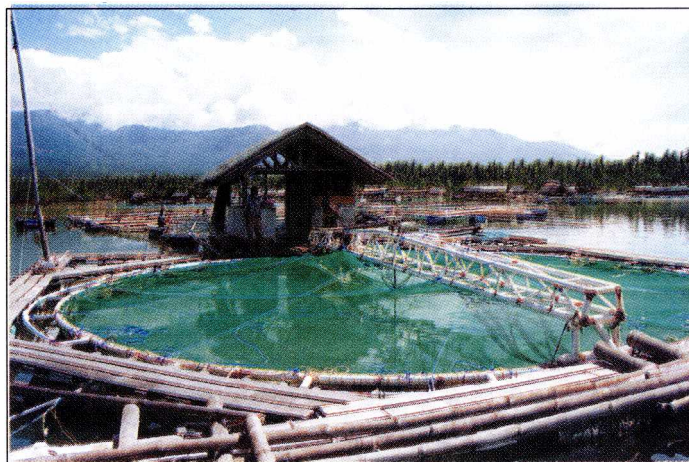
Breeding and hatchery

The milkfish industry in the Philippines is said to be more than 1,000 years old. All these years, it used to depend on fry catch from the wild. Today, Alson's Aquatechnologies, Inc., based in Sarangani Province supplies fry to Luzon, Visayas and Mindanao (the bulk falls on Mindanao)

when fry catch from the wild runs short of grow-out demand. Alson's said they can produce as much as 300 kg of eggs per day from 3,000 breeders. Raising more than a billion fry can not be far off.

Since the early '80s, the Bureau of Fisheries and Aquatic Resources used to maintain breeders under the National *Bangus* Breeding Program to address shortfall in fry production. But in 1996, due to administrative and technical problems, the program was privatized and the breeders were sold. Buyers of the breeders now maintain their own broodstock for their farms and sell what they do not need.

Some farmers say that they prefer to stock wild-caught fry because they are sturdy and fast growing. But fry brokers say that buyers have no way of knowing whether they are wild or hatchery-bred as



Circular broodstock cage and the egg collector (SEAFDEC/AQD designed) in Tagabuli, Davao del Sur. About 60 pieces of broodstock were sold to Alson's Aquatechnologies in 1996

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Bangus production in the Philippines has gone a long way. Big companies are now into value-added production like boneless bangus. For consumers who love the best part of bangus -- the belly -- they might be interested in the "choice cuts" pack. All-belly, heads-and-tails, fish shoulder are now sold in supermarkets



sometimes, hatchery-bred fry are mixed with wild and passed on as entirely wild caught. Price of fry fluctuate greatly from P0.40 to P1.25 apiece.

A problem identified by breeders is that when demand for fry is low and it is not sold within 21 to 24 days from hatching, cost of feed and labor plus the low survival lead to poor profit. Thus, most farmers are hesitant to start a hatchery operation even if they themselves have grow-out farms.

Grow-out practices in southern Mindanao

It is interesting to note that in the past three years, southern Mindanao's *bangus* production has steadily increased and accounted for 18% of total national export volume. *Bangus* is cultured in ponds, pens, and cages. In 1997, it ranked 5th in the national production volume (11,000 tons) with west central Philippines (Iloilo-Negros area) being number one (47,000 tons). Southern Mindanao's production increased by 85% from the past two years. Southern Mindanao, also known as Region XI, comprises Davao City, General Santos City, Tagum City, Samal Island; Davao del Sur, Davao Province, Davao Oriental, and Compostela Valley; Sarangani Province, South Cotabato.

Sea cages in Samal Island

Offshore milkfish cages in Babak, Samal Island have been installed by Mr. Teodoro Cruz, chair of a Region XI multi-purpose cooperative RAMUCO.

His cages are made of foam-filled circular polyethylene tubes held together by braces. The braces support "posts" which support the handrails. He stocks *bangus* fingerlings at 50 pieces per m³ and can readily support a biomass load of 25 tons per crop. The cage has a diameter of 12 m. He harvests 22 tons per crop. Mr. Cruz has a survival rate of 95% with a solar powered automatic feeder which ensures continuous feeding during the day. He reminds others, however, to stock at least 15 gram fingerlings in floating cages



Mr. Cruz's *bangus* cages. Beside his *bangus*, he has square floating cages (8 x 8 m) made of steel pipes which he stocks with pomfret, grouper, and rabbitfish

as the bigger-sized ones can tolerate stress better. He buys most of his fry from Alson's in Sarangani Province and sometimes from other brokers.

Mr. Cruz identified several problems that he encounters as he continues with his enterprise. First, there is no established marketing system. The *bulong-bulongan* (whisper) style of marketing predominates. Through this method, price is negotiated between the seller and buyer secretly, thus, there is a wide fluctuation of prices. If harvest from other farms or from Taiwan import arrives while price is being negotiated, the price is drastically affected. The second problem is the high interest on loans for agri-aqua. He says interest rate is from 14 - 25%. Third, middlemen proliferate. It would also be beneficial if the producers themselves are allowed to produce, process, and market their products and place mechanisms to allow them a margin of profit.

He recommends several measures. Mr Cruz wants that producers form coopera-

tives in order for them to be able to push for initiatives to improve production. Saying that media can "make or break an industry," he explains that media can dramatize demands, thus, solutions to problems are immediate. He also says that it is time for people to learn to eat processed *bangus* so that the portions that are thrown away (entrails, head, scales, tails) can be gathered and processed for feed.

Mr. Cruz wants the snail problem addressed immediately. Perhaps, he says, the government can allow aquaculturists to use the banned chemicals (organotins) in ponds under controlled use. Saying that ponds do not use chemicals as much as agriculture, it is unfair to

include aquaculture use in the ban. The next recommendation he mentioned is for SEAFDEC to please study the cure for *hangla*, a natural phenomenon in ponds when water becomes turbid because of a circular motion in the water that brings the residue to the surface, affecting water quality, and ultimately fish are killed. Again, perhaps, a chemical in tablet form can be made, and once *hangla* occurs, a tablet could restore the water's placid state, avoiding fishkills.

The last is to strengthen hatchery production, not only *bangus*, but all cultivable fish species. He realizes the power of the hatchery owners as he is still dependent on fry supply, whether from the wild or hatchery. Both kinds of fry perform well, and he says that whoever controls fry supply controls the industry.

The cooperative is a step towards finding solutions to their problems. RAMUCO has 500 members and is into technical services, marketing, financing, consulting, and

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Emilio Yulo of Alson's Aquatechnologies Inc

anything that the members need. The members are either seaweed farmers, tilapia, inland and coastal pond owners, and fry gatherers. A subsidiary cooperative for transport or trucking of aquaculture products is also being organized.

Alson's intensive ponds

Alson's Aquatechnologies in Sarangani Province has 208 ha intensive fish ponds. They produce 10 tons per ha and do not encounter yet much production problem. The secret perhaps, is in their strict production documentation. All these are inputted in computer data bases, allowing them to easily pinpoint discrepancies in target production in specific areas in the farm. For example, if a certain growth target has not been achieved within a period, an inspection of the parameters would allow them to make changes in their protocol. The documentation also allows them to project, plan, and improve future production protocol and standardize production methods. Size at harvest is mostly 3 fish per 2 kilos, harvested after about 170 days of culture. But they can harvest other sizes if buyers specify them.

Markets are the Philippines (70%) and abroad (30%). Mr.



Harvest at Alson's. Weight of bangus is ≥ 780 g, ideal for processing for export

Emilio Yulo, operations manager, identified difficulties in the business. He said that government processes must be made simple to make business move efficiently. Sometimes, too, government regulations are unclear. But the bigger problems are the laws that allow the Philippines to import fresh, frozen bangus but ban the export of fry! The law must be repealed especially if we are capable of exporting hatchery fry. When asked about snails, Mr. Yulo said that they apply hydrated lime and urea.

Cages in Tagabuli and Lake Buluan

Ms. Mila Lim has been raising bangus for 2 1/2 years now in 2 cages (10 x 20 x 3 m

divided into 4 small cages) in Tagabuli, Davao del Sur and markets her produce in the *bangketa* (stalls) in the market. Stocking is 3,000 pcs per cage module. She says business is profitable as she can market her produce in 92 days. The biggest chunk of her budget goes to feeds but if she is able to sell at P60 per kg (3 pcs per kilo), she can make profit. If the Lake Buluan bangus is marketed with her produce, she has difficulty regaining her capital because Lake Buluan bangus sells cheap. Buluan Lake bangus refers to bangus extensively produced in the lake. She wants bangus producers to form cooperatives so that they can schedule harvests. That way, no two producers would hit the market at the same time, and maybe, make the market more stable.

In 1996, Mayor Suharto Tan Mangudadatu started raising bangus in pens in Buluan Lake. Sul-

tan Kudarat and Maguindanao. Today, the pens (made of bamboo and polyethylene nets) occupy about 500 ha of the 8,000 ha lake. Stocking is 50,000 fry per ha with 75% survival from the hatchery of Alson's. Mr. Mangudadatu does not feed his *bangus*. He stocks fry and harvests after 4-5 months of culture. He sells his produce in Digos, Cagayan de Oro, Iligan, and Davao.

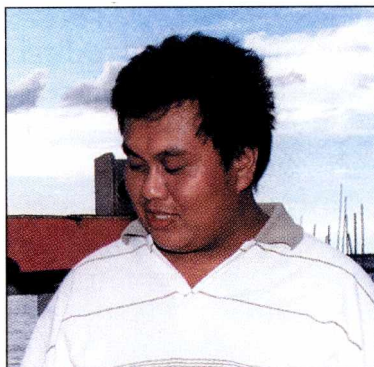
The Bureau of Fisheries and Aquatic Resources has a research outreach station in Tagabuli Bay, Lupang, Davao del Sur. They use the "Pagbilao cages" (named after the cages in Pagbilao, Quezon see photo) made of bamboo, galvanized GI pipes, and plastic drum floaters, measuring 10 x 20 x 3 m and 6 x 10 x 3 m. Stocking is 2 fish per m³. The station is used for training and demonstration.

Processing

Processing of *bangus* into "value-added" products is concentrated in General Santos City and Sarangani Province because of the presence of world-class processing and storage facilities like Dole Philippines and Alson's AquaTechnologies, Inc.

Alson's products are deboned smoked, fresh frozen, belly, back, and head and tails. Production per week is 50 tons; export to Bahrain, Hong Kong, Japan, Los Angeles, San Francisco, and New York; to Manila at Andok's, Kabalen, Max's, and Philippine Airlines. These are vacuum-packed. Mr. Yulo (mentioned in preceding paragraph) said that technology for processing comes from the DOST prescribed technology for *bangus* while the smoking procedure was "copied" from Salinas, Cavite, which is famous for smoking *tamban*. He claims that they have already perfected smoking and that they can now export smoked *bangus* despite very strict requirements. Export requirements are in compliance with HACCP, GMP, and ISO 9000 and the identification of the maximum storage life of the commodity. Alson's has 300 deboners daily to supply market demand for deboned *bangus*.

In Piapi, Davao City, a community



Mayor Suharto Tan Mangudadatu has *bangus* cages in Lutayan Lake (left and middle photo). The cages occupy almost 500 ha. He is not the sole owner. Others have also put up their *bangus* pens as the lake has become known to raise *bangus* without feeding

per person with a minimum participant of 20. He claims that he taught the 26 initial deboners at Alson's who now earn their living from deboning. Price is P6 per piece and a person can debone 50-100 pieces daily depending on skill. A seasoned deboner can finish 100 pieces per day.

Mr. Tutdud describes and demonstrates the deboning of *bangus* thus: (1) make a cut around the base of the dorsal fins and immediately pull these forward to remove the fin bones; (2) cut open the fish from the dorsal side from head to tail and form a butterfly fillet; (3) remove the gills and viscera; (4) lay the fish flat on its open skin then loosen the backbone by cutting from head to tail with the blade of the knife held horizontally; (5) pull out the backbone and the attached rib bone will come out; (6) make superficial slits on the dorsal muscle, and with a pair of forceps pull the intramuscular spines embedded between the muscles; (7) pull out the y-shaped spines along the lateral line at the junction of the dorsal and ventral muscles; (8) clean the deboned fish and drain.

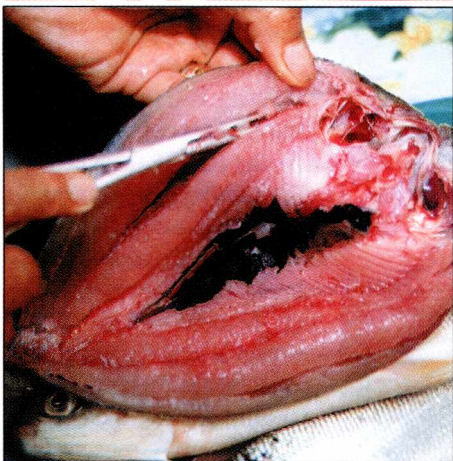
In preparing the product for storage, the deboned *bangus* is placed in long stainless trays for contact plate freezing. Freezing or cooking time takes about two hours after which they are made ready for packing. The *bangus* are then packed individually in plastic and sealed with an electric sealer. These are cold-stored for one week before being exported.



Toto Sanz of BFAR Research Outreach Station in Tagabuli Bay, Davao del Sur is beside the "Pagbilao" cages

makes a living from deboning *bangus*. Mr. Fred Tutdud, a deboner since 1973 says he now conducts training because deboned *bangus* has already gained a big market in Davao City and vicinity. He charges P150

Mr. Fred Tutud of Davao City debones 100 bangus per day. He now trains others who want to learn how to debone. He says it is essential that flesh do not stick to bones when these are taken off. Photos below show the steps in deboning, the backyard way



Milkfish canned products



Canned products are processed in Indonesia, Philippines and Thailand. The principle of canning is similar in most countries. Cleaned and gutted, the fish is packed in cans and pre-cooked before sauce or liquid is added. After seaming (joining one part of the can to another), the canned product is sterilized and cooked before labeling.

In the Philippines, the Victorias Foods Corporation (VFC) in Negros Occidental produces canned milkfish (*Hot bangus in oil, Spanish style*). According to its General Manager Nelson Sotomil, the estimated production is nearly half a million cans, requiring 95,000 kg or 95 tons of bangus. Mr. Sotomil said that the local milkfish producers (in Negros) can ably supply their requirements.

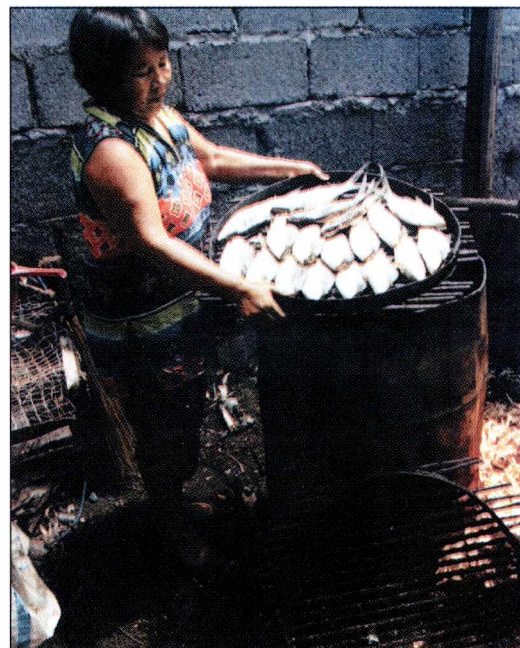
Production cost depends on prices of raw materials, specifically bangus prices which oftentimes fluctuate. Annually, export is valued at P0.8 to P1.2 million and domestic sales at P9.0 to P10 million. VFC exports only to the United States.

- By E Gasataya and L Tabigoon Jr

The Dole Philippines Diversified Processing Plant in Polomolok, South Cotabato processes several kinds of species for export, including squid, octopus, tuna and bangus. They provide assistance to small business in obtaining ISO certificates to certify that their products are processed in accordance with global standards. It also ensures that in-house rules, standards, and procedures are strictly followed by the companies that process their products with them.

Backyard deboning and smoking was documented in Davao City. In one home, smoking was done by first deboning, then boiling the bangus in brine water where taste depends on the cook's preference, sun or oven dried, place in a *bilao*, and put over a smoking chamber. The smoking chamber is an open top, empty drum designed to burn woodshavings. On top of which is a rack which holds the *bilao*. The chamber is first allowed to get hot, then filled with packed woodshavings to create smoke. When smoke becomes heavy, the bangus on the *bilao* is covered by a straw sack to keep the smoke on the fish. It is interesting to note that in some supermarkets in Davao City, several trade names of various processed bangus products can be found in their freezer sections.

The smoking rack and chamber for bangus. Wood shavings are used for fuel. Bangus are first cooked in brine and dried before smoking



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