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# Milkfish breeding and hatchery fry production

Aquaculture Department, Southeast Asian Fisheries Development Center

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Aquaculture Department  
SOUTHEAST ASIAN FISHERIES  
DEVELOPMENT CENTER

Milkfish  
breeding  
and  
hatchery fry  
production

# Integrated milkfish broodstock and hatchery operation

Milkfish aquaculture in the Philippines has recently expanded from the traditional culture in brackishwater ponds and freshwater pens to marine cages and pens. Furthermore, it has evolved from extensive (low stocking density, no supplemental feeding) to intensive (high stocking density with supplemental feeding) culture. Yet, the fry needed for culture still comes almost exclusively from the wild where the supply is seasonal and subjected to climatic and pollution constraints.

Sexual maturation of milkfish begins after five years of rearing from fry. Natural spawning occurs annually in milkfish reared in floating net cages or concrete tanks. Spawning usually occurs at midnight to early morning hours following chasing and violent splashing behavior. Eggs are collected and reared in the hatchery for fry production.



Milkfish broodstock are reared in 6- or 10-m diameter by 3m deep floating net cages at SEAFDEC AQD's Igang Marine Substation. While cages are easy to manage, check, clean and repair, they must be installed in areas protected from strong waves, currents, and winds. Cages are lined with a fine mesh net to retain eggs. Eggs are collected using a manually-operated sweeper.

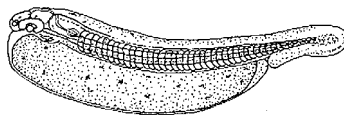
With the ultimate goal of ensuring an adequate supply of milkfish fry to sustain its aquaculture, SEAFDEC AQD in Tigbauan, Iloilo has embarked on milkfish breeding and seed production research. In the late 70's, wild milkfish breeders were successfully induced to spawn but the difficulty in obtaining milkfish breeders and the unreliable production of viable eggs saw the need to develop a stock of captive breeders (broodstock). After five years of rearing, milkfish spontaneously spawned in floating net cages in 1980 and in concrete tanks in 1990. Egg productivity of broodstock in these holding facilities were found adequate to support hatchery fry production.



Milkfish broodstock are maintained in 10x10x2m deep or 10x25x2m deep concrete tanks with a recirculating seawater system and continuous aeration at SEAFDEC AQD's Tigbauan Main Station. Eggs are collected using hapa net bags attached to the outflow of PVC pipe airlifts.



Milkfish eggs are pelagic, transparent and with no oil globule. Developing embryo is observed 12-14 hours after spawning, and hatching occurs 24 hours after spawning (26-29°C).



Newly-hatched larvae are planktonic with a large yolk sac, unpigmented eyes and no mouth. They are stocked in larval rearing tanks.

With the consistent supply of eggs from captive breeders, hatchery fry production technology was gradually generated. This technology has been verified for its biotechnical and economic feasibility. Fry from the hatchery has been raised by several fishfarmers in Iloilo, Negros Occidental and Guimaras provinces. Pond production using hatchery-produced fry was similar to that of wild fry.



Milkfish larvae are reared in concrete tanks of 1m depth provided with filtered seawater and aeration.



From two days after hatching until harvest, milkfish larvae are fed with rotifers cultured with a diet of the green algae, *Chlorella* sp. Artificial larval diets formulated by SEAFDEC AQD are also given as supplement.



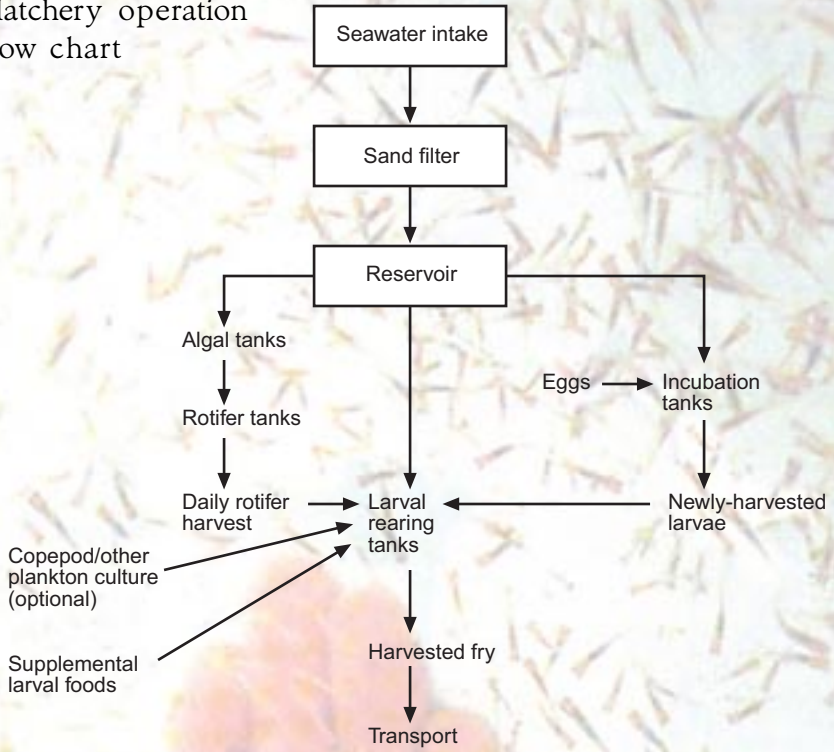
The breeding and seed production research at SEAFDEC AQD has developed a technology that can reliably mass produce fry to meet the requirements of fishfarmers. Adoption of this technology will guarantee the sustainable growth of milkfish aquaculture in the country.



Milkfish fry are harvested after 21-23 rearing days for grow-out culture.



Hatchery operation flow chart



For more information, contact:

**SEAFDEC Aquaculture Department**  
Tigbauan, Iloilo, Philippines  
Tel: 63 (33) 335 1009, 336 2965, 336 2937  
Fax: 63 (33) 335 1008, 336 2891  
Email: aqdchief@aqd.seafdec.org.ph  
ordh@i-iloilo.com.ph