

The culture of tilapia

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Tilapia can be raised in cages, tanks or in ponds in monoculture or in polyculture with other fishes. Integrated farming with other agriculture crops has also been done. Culture techniques may be extensive, semi-intensive or intensive, their differences summarized in the table below.

Here are the other details of tilapia culture:

Cage culture

Cages are installed in lakes, dams, rivers, raceways, canals and impoundments or

even in the open sea. The use of cages has many advantages over ponds and tanks. Cages are less expensive, stocking density can be increased, and management is relatively easy.

Tips for site selection

- select places where natural food abound. Greenish water indicates rich natural food;
- select places free from strong winds, waves and currents;
- check capability of bottom to hold posts

during the entire culture period; and

- accessibility

Cage design

Fish cages can either be fixed or stationary or floating depending on the depth of the water. The most common types of net for cage fabrication are B-net (1/4" mesh), DD net (3/8" mesh), and CC net (1/2" mesh). Mesh size should be as large but should not allow the fish to escape.

Fixed or stationary cages

Fish cages attached to a staked bamboo (30

	Extensive tilapia culture		Semi-intensive culture		Intensive culture		
	Cages	Ponds	Cages	Ponds	Cages	Ponds	Tanks
Culture period	4-6 months	4-5 months	4-6 months	4-6 months	4-5 months	4-5 months	4-5 months
Size at stocking	10-20 g	10-20 g	10-20 g	10-20 g	10-20 g	10-20 g	10-20 g
Stocking density	20-40 per 10-15 m ³	5,000 - 20,000 per ha	10-25 per m ³	20,000- 40,000 per ha	50-200 per m ³	50,000- 100,000 per ha	100- 200 per m ³
Water management	none	50% water change after 2 months	none	frequent water change	none	5-10% daily change	flow- through
Fertilization	none	2 weeks after pond prep	none	applied in the first two months	none	only at stocking	none
Feeding	none	none	moderate feeding	2-3% of body weight (supplemental feeding 2x daily on the 3rd month)	2.5-6% of body weight (using pellets with 25-30% crude protein)	3-5% of body weight (using pellets with 25-30% crude protein)	3-5 % of body weight (using pellets with 25-30% crude protein)
Use of aerator/s	no	no	no	optional	optional	yes	yes
Size at harvest*	100-150 g	200-300 g	100-300 g	150-200 g	150-300 g	ave. 300 g	> 300 g
Survival rate	60-70%	60-90%	70-90%	60-85%	50-70%	60-80%	70-85%
Yield	depends on fertility of the water		10-20 kg per m ²	1-3 tons per ha	60 kg per cage	6-15 tons per ha	1-2 tons per 100m ²

*Size is based on the Philippine market; in other countries, market size is usually not less than 500 g.

cm deep) are suitable for shallow areas. Its basic framework consists of nylon net sewn similar to an inverted mosquito net. The net flooring which may or may not touch the bottom is kept at least 0.5 m above the water level. A brace strengthens the posts while a cover protects the stocks from floods and poachers.

Floating cage

This type is suitable for depths of 5 m. The netcages are attached to bamboo rafts. Lead sinkers attached to the net flooring holds the structure in place. A freeboard of 1 meter is left above the waterline. Bamboo rafts, oil drums, or styrofoam may be used as floats.

Stocking density, growth and survival depend on the fertility of the water and size of fingerlings and cages (see table on page 16).

Ponds

Tilapia ponds vary from 0.25 to 2 hectares. The enclosing dikes are about 1.5-2 m high. Water depth of 1-1.5 m is maintained (freeboard is about 0.5 m). The pond bottom should be well compacted to minimize seepage.

Three culture methods may be done in pond grow-out:

- (1) extensive where natural food is promoted in the ponds with organic and chemical fertilizers;
- (2) semi-intensive where supplemental feeds are used in addition to fertilizers;
- (3) intensive where complete feeds are given along with frequent water change to sustain the high-density. Site selection and pond construction and preparation are basically the same with that of other culture species. Lablab or plankton may be grown for tilapia in brackishwater ponds.

Requirement for lime and fertilizer depends on type of soil. Organic fertilizer is applied to improve soil texture, increase water holding capacity and conserve soil fertility. Fertilize the pond by suspending sacks of dried chicken or pig manure in the water by means of poles or placed at the bottom at the rate of 500 to 1,000 kg per ha per week. Apply fertilizers such as ammonium phosphate and diammonium phos-



phate (25-50 kg per ha every two weeks) in suspended jute sacks to slowly release the nutrients.

Tanks

The intensive culture of tilapia in tanks requires artificial feeds thus water management is critical. Rectangular concrete tanks are suitable in limited areas. A tank of size 20 to 500 square meters and 1.2-1.5 meters deep may vary in shape: rectangular, square, octagonal or circular.

The disadvantage of tank system is the high cost for infrastructure and operation. Other costs include fuel, manpower, and maintenance.

Feeds and feeding

The amount and kind of feeds depend on the culture method used. It is required in tank culture systems or in waters with low primary production. Feeding rate is adjusted depending on the average weight of fish.

Tilapia in cages used to enjoy the plankton rich lakes and needed only minimal supplemental feeding. Now, congestion of cages in lakes have led to poor fish growth and dependence on feeds for better yield.

The use of supplemental feeds is necessary in intensive or semi-intensive culture. Organic or inorganic fertilizer is needed for natural food production in the first two months of culture. In the third or fourth month, however, natural food becomes limiting, hence, feeding is neces-

sary. Although commercial feed is available, the cost can comprise as much as 60% of the total farm production cost.

Rice bran (11-12% crude protein) may be given at 3-5% of tilapia body weight. Some researchers have noted that the cost was only 45% of operating expenses. A yield of 3-4 tons per crop and 84% survival can be attained with the use of rice bran as supplemental feed. A practical diet of 75% rice bran and 25% fish meal in moist pellet form has also been tested. A yield of 25-40 kg per m³ in 2-4 months culture period and a feed conversion ratio of 2.5 are attainable.

In intensive culture, formulated diets from fish meal, rice bran, copra meal and soybean meal in mash form are given at 3-5% of tilapia body weight.

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