

Managing a Healthy Tilapia Operation

Fish farming is a business that must be taken seriously. If proper management is not employed, serious losses may be encountered. Good management practices include proper and limited handling of fish, proper feeding techniques, correct stocking densities and good water quality management. This will also ensure healthy fish. External characteristics of a healthy fish include:

- Bright, mucus covered pigmented skin
- Flat and firm scales
- Bright red gills
- Firm and elastic muscles
- Clear and slightly protruded eyes
- No nodules, parasites or ulcers on the skin

Here are some tips for managing a healthy tilapia operation.

Sourcing Seedstock

One of the first steps in Tilapia production is the sourcing of seedstocks, which may either be fingerlings or advance fry. During investigations one should keep in mind that cheaper is not always better, neither is more expensive always healthier. Additionally, farmers must seek sources with proven record of a high percentage of all-male fish, (e.g. 97%), which will reduce the chance of reproduction occurring.

Pond Preparation



The pond should be prepared ahead of delivery so as to ensure that it is in good condition for stocking. Fertilization may occur after the ponds are cleaned and filled - or during filling.

Fertilization

Fertilization of fish ponds helps to develop algal bloom which causes the green colour in pond water. Algae are important in fish ponds because it provides another source of food for fish. However, too much algae will use up the oxygen during the night. It may also contribute to turbidity which will restrict light penetration; hence, reduce oxygen production.



Air stones are attached to hoses to provide the fish with oxygen as they are being transported.



The different method of transportation is selected based on the number of fish and the length time to be spent in transit.



Preparation for Transport

Fish should be captured and held in a separate area 24 hours before transportation. This facilitates reduction in stress due to ease of recapturing. Note also that fish should not be fed during this 24 hour period and care must be taken not to over exhaust them by lengthening their stay. Because when fish are placed for long periods in the same small amount of water, water quality starts to deteriorate.

- Dissolved oxygen (DO) is reduced
- Carbon dioxide (CO₂) increases
- Other toxic compounds such as ammonia and nitrite increase

Transporting

The fish should be loaded and unloaded with minimum handling and stress. Some suppliers may arrange delivery of the fish or ensure that you (the buyer) have the equipment needed to successfully transport them.

Note that a small amount of small fish is often more easily transported in plastic bags containing water and oxygen, while larger numbers of fingerlings are best transported in hauling tanks. One should select tanks that are insulated with wood or styrofoam to reduce or maintain temperatures while the fish are being transported.

Stocking

Before the arrival or even the purchasing of the fish, you should determine the quantity and size of the fish you wish to stock because overstocking can pose serious threat to fish's health. When fish are over stocked they compete especially for oxygen and food. Where oxygen is the source of competition, larger fish will die first; however, when competition is for food, the larger and more dominant fish will survive. This is why it is also important to stock fish of equal sizes.

Stocking is done in two steps. The first step is Acclimation and the second Release & Observation

Acclimation:

Fish should be slowly adjusted to water temperature and chemistry. Proper acclimation requires minimum 15 - 20 minutes of gradual adjustment for every 10-degrees difference in water temperature.

How to Acclimate

- Fish in plastic bags with oxygen
- Float the bags in the receiving water without opening them until the fish are acclimatized to the temperature. Opening the bags allows the oxygen to escape, and the fish must be quickly released.
- Fish in hauling tank(s)
- Gradually mix the new water into the tank until temperatures are equalized.

Release & Observation:

After temperatures have been equalized, gently allow fish to swim out in open water by submerging the container. Fish which are properly handled and stocked should remain active and swim off quickly into deeper water after release.

Fish which are stressed from transport or improper acclimation often sink to the bottom, or swim weakly. Stress due to improper handling and stocking usually manifest itself in diseases and mortality, either in a matter of hours to several days, after stocking.

Pond Management

Feeding

Feeding of tilapia is done based on percentage body weight. The main problem that most farmers encounter is overfeeding. Overfeeding generally causes deterioration of water quality which then kills the fish.



Sampling

This is the selection of individuals from the total population for observation, so as to adjust feeding or to observe the health of the fish. Sampling is generally done using a seine net or a cast net.

Tilapia is best sampled using a seine because faster moving fish will escape the net giving inaccurate assessment. Whichever method is used, be sure to limit the handling of the fish and disturbance of the pond bottom. During 'seining' care must be taken not to stress the fish.

1. Do not pull the net against the current
2. While hauling the net, shake out the mud
3. Do not pull the fish too close in the bag

Water Quality

Good water quality is necessary for the success of every farm. Some parameters to keep in mind are as follows:

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|---------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Dissolved Oxygen: | This is the amount of oxygen in pond water that is available to be used by fish. The acceptable range for freshwater fish is 5 – 7mg/L |
| Ammonia: | Comes from the decomposition of wastes. It is very poisonous to fish and will cause death. Levels should be below 0.05mg/L. |
| Nitrite: | Very poisonous to fish and causes Brown blood disease, which kills fish. Must be below 0.01mg/L |
| Hydrogen Sulphide: | Colourless toxic gas with an odour similar to rotten eggs. It kills fish by interfering with respiration. However, it can be treated with potassium permanganate or liming. |

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