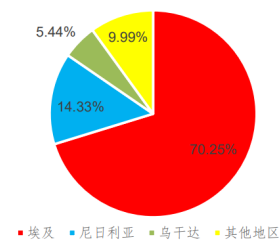


## Key Point Of Aquaculture in Africa

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Aquaculture production in Africa is about 1.9 million tons each year, Egypt is the largest aquaculture country in this area, accounting for 70% of the total amount, Nigeria 14.33% and Uganda 5.44%. As the most popular species in Africa, tilapia and catfish mainly cultured by earthen pond without any aerator. Local farmers need to change the water in the pond everyday to maintain the dissolved oxygen. Due to the lack of technical support and relevant product, most of the farmers culture the fish just according to their experience which makes the error tolerance extremely low, each kind of disease may lead to a great loss to the farmland owner. For this kind of aquaculture models, it is very important to manage the farmland accurately and key point of the management is the “Water” 、 “Seeding” and “Feed” .



Cages in the earthen pond

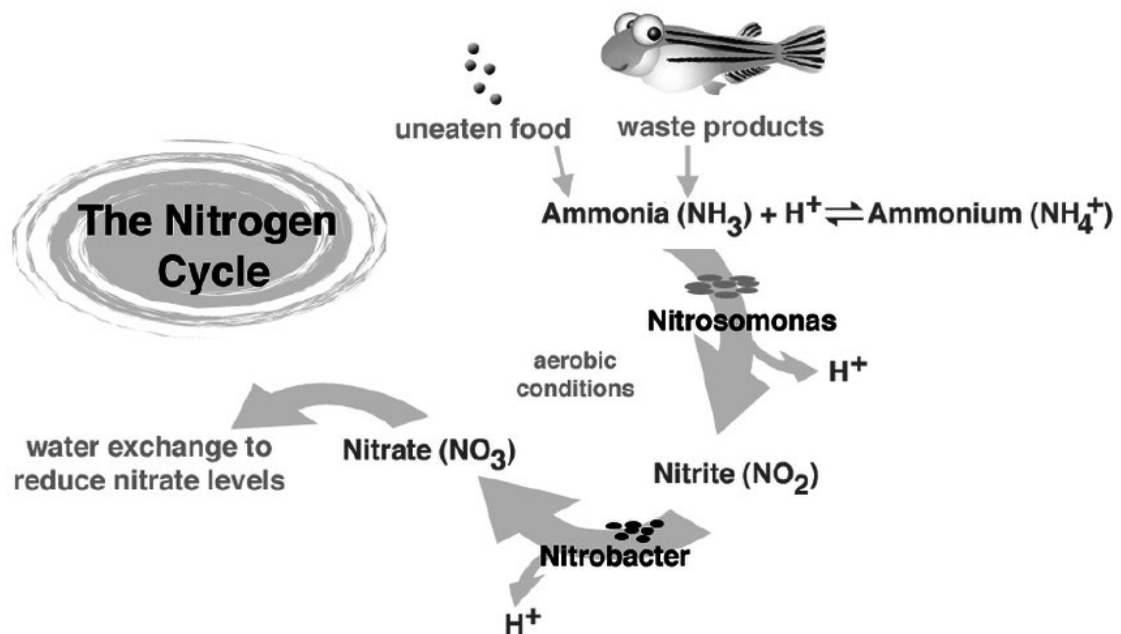
### Water

Water is the basic condition for survival of aquatic animals, the quality of water affect the growth and develop of aquatic animals directly. Fish pond with water in good condition can promote fish growth speed and reduce the probability of disease, otherwise it will lead to the loss of appetite, decreased immunity and finally cause the death.



### Disease of Catfish

Water quality parameters can represent condition of the pond, including temperature, dissolved oxygen (DO), PH, ammonia nitrogen, nitrite, etc. According to different aquaculture species, total salinity, total hardness and total alkalinity can also be tested. The most used indicators are PH, ammonia nitrogen and nitrite.



### Nitrogen cycle in fish pond

Ammonia nitrogen mainly comes from residual feed, feces, fertilizer and body of animals. When accumulation of ammonia nitrogen reaches a certain concentration, it will become poisonous for fish. Normally ammonia nitrogen levels raised in the middle to late periods of the culture process, at this time,

due to the increasing of residual feed and feces, as well as the lack of dissolved oxygen in the bottom of the pond, nitrite cannot translate to nitrate timely, concentrate of nitrite will raise day by day. When the nitrite reach a high level, fish in the pond get weak or even die because of the oxygen-shortage caused by poor water quality, which will be a great loss for the farmers. So we need to check the water quality regularly and analysis the data we collect in time, if any problem exist, we need to solve it as soon as possible.

## Seeding

"Seeding" generally refers to the fry or fingerling of fish. Compared with the normal seedings, high-quality seedlings with good vitality and immunity, also grow faster than the normal one. Therefore, if famers want to culture fish successfully, it is necessary for them to know how to distinguish and purchase the high-quality seedlings.

How to distinguish the quality of Seeding.

- 1.Colour: The body colour of the fish should be similar, no variegated or died mixed in it.
- 2.Size: Size of the fingerling should be similar and none injury exist on the skin or the tail. Especially for the catfish, if the big fingerlings mixed with small fingerlings, the bigger one will start to eat the small one rather than feed which will decrease the survive rate. Therefor, purchasing or culture the catfish, we must separate those according to their size regularly.



Fingerling of catfish

- 3.Reaction: Put the finger into the container with fingerlings to stress them, if they swim fast with a swift response, the seeding quality is good, otherwise those fingerling are not qualified.

4. Swimming: Churning the water in the container to make a whirlpool, observe the swimming condition of fingerlings. Good quality one can swim against the current, weak one just flow and cannot resist.

## Feed

Feed is a prerequisite condition to keep aquatic animal survive and grow healthily. Fish need different kinds of feed at different period. For example, fingerlings grow fast, they must eat feed with high protein as well as small-particle size to meet the demand of growth. Large-size fish grow relatively slowly, so it is better to provide low protein and high energy feed to maintain fish growth and daily metabolic consumption.

Vitamin minerals, amino acids and other nutrients also play an important role in fish growth and health, the lack of vitamin minerals will affect the growth, development, immune and reproduction.

For example, VD3 can promote the absorption of phosphorus and promote the growth of bone. If insufficient, it will lead to incomplete bone calcification and affect the molting of shrimp. VE can promote the growth of aquatic animals, affect the immune system; Lack of VE can make fish grow slowly and disease resistance declined, easy to get disease such as skin rot, ascites, anemia and other symptoms.



Floating and Sinking fish feed

High quality feed not only needs comprehensive nutrition, but also needs to ensure the stability of feed in water, palatability and other physical factors. The sinking feed is divided into two kinds, one of them produced by extruder, while the other one produced by pelleter. Compared with the second one, feed produced by extruder owns higher digestibility and more stable in water. When feeding in large quantities, it will not affect water quality as the second one due to the reason of dissolving in the water so quickly.

In addition to the quality of feed itself, culture in fish pond should follow three points, feeding at fixed time, fixed place and regular amount. Training fish eat at fixed time and fixed place do good to observe their daily condition, if fish eat less than before, we need to check if there is any problem with the water quality, or any parasite exist on the fish. Observe feeding the fish everyday also help us to confirm the feed amount rather than add the amount blindly. It helps avoid wasting the feed and pollute the water condition.