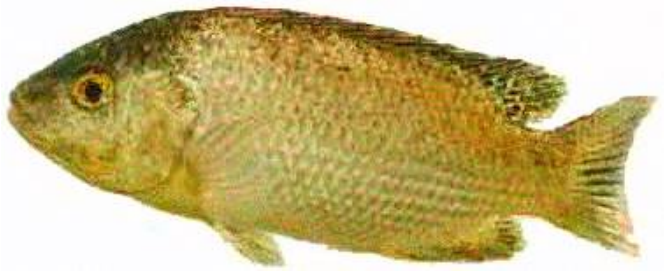
Tilapia - An Old Fish Tale with a New Twist



Tilapia is a fish that has been raised for centuries with little fanfare. In recent years with the worldwide emergence of aquaculture, increased attention is being focused on tilapia because of its superior culture possibilities. Reportedly more than one 1 billion pounds of Tilapia were raised last year. These fish are ideally suited for aquaculture because they are disease-resistant, reproduce easily, feed efficiently, and can tolerate poor water conditions.

Tilapia can be successfully grown in brackish water and some species can adapt to full strength sea water. Tilapia are members of the Cichlid family and are native to Africa. In many developing countries, tilapia are raised in ponds, cages and rice fields. Tilapia can also be grown in intensive culture systems, with corresponding greater investment cost.

Tilapia produce mild, soft, white fish fillets, with a slightly sweet taste. These superior qualities make Tilapia a culinary delight, whether served in an expensive restaurant or prepared simply for home consumption.

Since 1993, the growth of the Tilapia industry in the United States has skyrocketed, both in terms of volume and corresponding value of the imports. By 1994, Taiwan had gained controlling interest over the frozen fillet market, accounting for 66% of all frozen fillets entering the US. Thailand, Indonesia, and Taiwan continue to be major suppliers of frozen fillets.

A new trend towards imported fresh fillets has begun as consumers recognize the value of tilapia and are willing to pay higher prices for a quality product. For the U.S. markets, Costa Rica and Ecuador are important fresh fillet suppliers.

In a world where wild capture fisheries are becoming increasingly depleted, tilapia offer the possibility of commercial and home-grown protein sources.

Learn Tilapia Culture Techniques from an Expert

Mike Sipe is the first full time tilapia researcher and breeder in the U.S. with 28 years of experience. He runs a business that supplies genetically improved tilapia breeders to programs and businesses that want to produce food fish. Mr. Sipe works with tilapia which are a fish from Africa and has been doing genetic selection on them for 25 years. Mr. Sipe also describes the perfect fish.

Mr. Sipe has experience in teaching courses and consulting for people who want to learn how to grow fish inexspensively for food. He has helped start operations and or supplied breeders in over 30 countries and 20 states. See an example of an Intensive Tilapia Fish Farm project.

Order Tilapia Hatchery Manual

A comprehensive manual on rearing techniques for tilapia - Order Now

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Tilapia Information Resources

- American Tilapia Association
- Asian Tilapia Union
- Introduction to Tilapia culture
- Raising Tropical Food Fish in Small Greenhouses Promises Profit for Texans
- The Perfect Fish
- Tilapia Farming - Virtual Business Center
- Tilapia and the Environment
- Tilapia expert system computer program now available to farmers
- Tilapia Cage Culture
- Tilapia Farming
- Tilapia Freshwater Fishpond
- Tilapia Hatchery Management and Fingerling Production
- Tilapia Production and Marketing
- Tilapia Recipes
- Cichlids Newsgroup: rec.aquaria.freshwater.cichlids

Note: If you keep tilapia in aquaria or ponds do not allow them to escape into waterways. Because of their hardiness tilapia can displace native species if they are introduced into natural waterways where the tilapia are not naturally endemic. See references on potential as a nuisance species when introduced into non-native waters.

- Aquatic Nuisance Species in Alabama
- Introduced Freshwater Species in Western Australia

THE PERFECT FISH

by Mike Sipe

MIKE SIPE is an Aquaculture consultant and has been in the Tilapia production and genetic improvement and breeding business for over 25 years. He created the first red tilapia from black ones and now maintains and distributes 10 specially bred tilapia gene lines used to produce faster growing tilapias to clients and dealerships worldwide.

Since I first began to study tilapia, I was made aware of the fact that almost everyone has in their mind the perfect fish for growing. It started with the *Scientific American* article by C.F. Hickling, "The Cultivation of Tilapia," which listed criteria that would make the perfect fish from the point of view of growing fish to prevent world starvation. They made a list of all known fish and looked at the various skills needed to cultivate these fish, including the difficulties of breeding the fish. Tilapia were one of the fish on the list, and when you got through reading the article it was hard to think that any fish other than tilapia could be considered.

As I began my aquaculture project, at first I thought that the definition of this fish was considerably different from person to person. If you listen to what people say it may still be different from person to person, but if you look at what they do you will find that the image of the perfect fish begins to blur into a single image after all. When I first read about tilapia in *Scientific American* in May of 1963, I was told that aquaculturists had been looking at tilapia for some 50 years. They felt that tilapia had a good chance of qualifying as the perfect cultivation fish. They breed continuously, so production of seed is very easy. The tilapia are very hardy and hard to kill. They eat almost anything, and, therefore, they are easy to feed.

Tilapia were very hardy and could withstand wide ranges of water quality and temperature as long as their was some time to adjust to changing conditions. For instance they have shown the ability to adjust to pH changes from 4 to 10 and even further with more adjustment time. Salinity changes in some species could go from zero parts per thousand to 50 parts per thousand without killing the tilapia. This means you could grow those tilapia in fresh water ponds or in the open sea without killing the fish as long as you moved them gradually from one level to the target level, or about 30 hours per 10 parts per thousand.

Growing shrimp with tilapia

The fact that tilapia lead a life that is 98% vegetarian also means that they can be stocked with other crops such as shrimp without losing shrimp to the tilapia diet. The tilapia starts life as a tiny minnow about 1/4 inches in length and grows very rapidly to 2 or 3 inches. During this period of rapid growth it has very high protein demands that can only be met by eating other fish or animals, so during this period the tilapia is predatory. It becomes vegetarian as the ability to harvest algae and detritus increases to the point where it no longer needs the extra protein. This means if you stock 2 inch (or greater) fingerlings in shrimp ponds you should see very little predation of the shrimp, if any.

This vegetarian characteristic, along with their ability to undergo large salinity changes, has led in recent years to the stocking of shrimp ponds in many tropical countries with tilapia, both to create a second crop and to help reduce the disease risk in the shrimp ponds which diminishes because of the tilapias ability to eat decomposing feed and other debris off the bottom of the shrimp ponds.

So, people who have access to either fresh or salt water can learn to grow tilapia.

Temperature is another factor, but because no fish grows very much at temperatures below 50 degrees, tilapia can grow at an acceptable rate even at 60 or 70 degrees. Also, because they grow slower at the lower temperatures, a grower can get by with more fish per cubic foot at lower temperatures. He can then make up some of the difference in growth rate by having more fish that grow slower but, when added together, produce weight gain totals that make that growth more acceptable.

Another characteristic that makes tilapia the "perfect fish" is the ability to eat food of vegetable origin or even food that is being biodegraded (composted). The fish are able to digest the bacterial cell walls, so that even when the food consists of bottom debris the tilapia has been shown to be capable of digesting up to 70% of the material.

Several species of tilapia have even been stocked in dams to help create a situation where the amount of debris being deposited by waters moving into the dam can be diminished. For instance, the Aswan dam in Egypt was found to be loosing 3 to 4 inches per year due to deposition of debris. Tilapia nilotica were stocked in the dam, and the amount of build-up actually began to go the other way. Up to 2-3 inches a year were being removed by the tilapia.

Now, all of the above refers to basic physical characteristics of common tilapias, which allow the grower more latitude in choosing tilapia as a growing fish. Other characteristics such as color, overall rate of growth, and cost of fingerlings now begin to become a major area of concern when deciding "which" tilapia to grow.

The ability to grow tilapia in ponds and tanks has always meant that the total number of tilapia in the tanks or ponds was a consideration as well as how fast they grew. Since growth rate is an average of all of the fish in a group and varies in most tilapia from tilapia, you have to grow several hundred and measure the total weight at a given point in time, such as at six months. Then add all of the weights together and divide by the number of fish. So slow growing tilapia mixed with fast growing tilapia means an average growth rate that is considerably slower than the growth rate of the fastest growing tilapias.

Raising faster-growing fish

Since "everyone knows" that female tilapia grow slower than male tilapia, scientists came up with a method of treating all of the tilapia fingerlings with male hormones so those fish that would have been female now turn out to be male. Then all of the fish in the growing tanks or ponds will be male, and the average growth rate will be higher than it would have been with half males and half females.

Now even the US government supports the use of reversal techniques by allowing all of the tilapia hatcheries who wish it to participate in what is known as an INAD. This basically means they have the right to put chemicals into the food of the fish that are not yet cleared as being safe, as long as they send results in to the government.

Almost every tilapia grower now uses hormone-treated fingerling tilapia. This basically reduces the time it takes to get the tilapia through the growing stage and hopefully allows for slightly higher profits from the sale of the fish since a farmer can grow more each year.

The truth is, however, that the only tilapia that grow faster if they are treated with methyl testosterone are the of the "pure line" species. These are produced by breeding, say, males of tilapia nilotica to female tilapia nilotica. If hybrids are produced using t. nilotica and *T. aurea* or *T. mozambique* and *T. hornorum*, any females that are produced will tend to grow as fast as the original male tilapia in the pure line species.

So now we have many tilapia producers saying they would like to have a perfect tilapia. The perfect tilapia would not have to be sex-reversed, and they would be a good color for the market.

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