

Tilapia Aquaponics Quick Fact Sheet

For High School Recirculation Systems
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Tilapia are extremely tough, flexible and versatile, but you can kill them. Here are a few parameters to check when dealing with tilapia, bacteria and plants.

Temperature (check daily)

<60 F	60-69 F	70-75 F	76-84 F (24.4 – 28.9 C)
Fish want to die	Fish may get sick	Fish may eat less	Fish are really happy
Bacteria not growing	Bacteria happy	Bacteria happy	Bacteria happy

Dissolved Oxygen (check daily)

<1ppm	1-3ppm	3-7ppm
Fish want to die	Fish are stressed	Fish are happy and will grow
Bacteria will die	Bacteria are unhappy	Bacteria are happy
Plants are not happy	Plants may stress	Plants are happy

pH (check 1-3 times per week)

<6.9	7.0-7.8	7.9 and above
Fish may eat less	Fish are happy	Fish will become stressed
Biofilter bacteria will die	Bacteria are happy	Bacteria are happy
Plants happy down to 5.5	Plants are happy	Plants are not happy

Above 7.2, high TAN has toxic NH₃

Total Ammonia as Nitrogen (TAN) (check 2-3 times per week until stable)

0-6ppm	4-10ppm	10-16ppm	17-21ppm
Fish are happy	Fish are happy	Fish may eat less	Fish are stressed
Bacteria are doing their job	Bacteria not working	Bacteria not working	
Plants happy from 0-1ppm	Plants not happy	Plants not happy	

Nitrite (check 2-3 times per week until stable)

No salt (chlorides) in system	Salt in system (use CaCl ₂ or KCl, not NaCl: toxic to plants)
Do not exceed 0.91ppm nitrite	Do not exceed 15ppm nitrite (must have 10ppm chlorides/1ppm nitrite for this to work) chlorides 200-2000ppm (0.275 – 2.75lbs/100gallons)

Nitrate (check 2 times per week until stable, then once per week)

A minimum of 5ppm needed for plant growth. Do not exceed 300ppm for good fish growth.

Feeding (1-3 times daily)

Feed fish a 28% - 32% protein catfish ration. For every 1000g of feed (2.2lbs) given to the system, add 142g (0.3lb) of sodium bicarbonate (baking soda)

When feeding the fish, use satiation feeding. This means you give them until they stop feeding. Ideally, no uneaten feed is left in the tank. Keep track of how much feed is given so when you harvest and weigh the fish, you can calculate feed conversion ratio (FCR). FCR = feed fed divided by pounds of fish gained.

If fish have previously been eating well and then stop, check water quality. Low DO, low temperature, high or low pH, and high ammonia or nitrite can all affect eating habits. If fish appear healthy but are dying, usually one of these parameters is responsible.

Biofilters

Biofilters require bacteria to process and eliminate waste products in the water. These bacteria may be purchased in powder or liquid form, but rarely do they properly seed and eliminate ammonia and nitrite in just a week as advertised. A general rule of thumb is 10 weeks until biofilter maturity. It can be more or less. As a result, the best thing you can do for your system over the summer is let it run and leave a few fish in to keep the bacteria going.