

1



WATER QUALITIES IN AQUAPONICS

Aquaponics works by repurposing fish waste into plant nutrients using beneficial bacteria.

More information on [aquaponics](#).



**College of Agricultural, Consumer
and Environmental Sciences**
Cooperative Extension Service

Water quality should be tested daily in new systems, weekly once cycling is complete and biofilter is established.

2

- Dissolved oxygen (DO) levels should be kept at 5 ppm or higher.
- Keep TAN (Total Ammonia Nitrogen)* below 1 ppm.
- pH should be maintained between 6.4 and 7.4, ideally 6.4 to 7.
- Water hardness should be maintained between 50 to 100 ppm.
- Alkalinity levels should be maintained at 100 ppm or higher.

*Water testing kits allow you to determine the ratio of toxic to non-toxic ammonia based on TAN (the total of both forms of ammonia), pH, and temperature.



Solid fish waste should be removed through settling or filtering before it enters the biofilters or grow beds.

3

Ammonia

- If levels are too high: check pumps and aeration, and reduce feeding rates or fish densities.*
- If levels are too low: add more fish, increase feeding rates, or use a smaller tank.

Nitrate

- If levels are too high: more plants can be added or more fish can be harvested.

*General rule is 1 lb of fish per 2 gal of water.

Water should be kept at a temperature tolerant to the fish, plants, and bacteria. This depends on the type of fish used.

4

pH

- pH that stays high and does not drop over time can be caused by hard alkaline water or a build-up of anaerobic zones in your system.
- If pH drops too low, add a base in the form of potassium or calcium hydroxide.*

Plant nutrients

- Calcium and potassium will be supplemented when additions are made to correct low pH.
- Iron should be supplemented by adding 2 mg/L of chelated iron every 3 weeks or as needed.

*In the Southwest, the water is often high enough in calcium that simply adding more water can balance the pH.

5

Biofilters can be established without fish by adding pure ammonia to the system and allowing beneficial bacterial colonies to grow in response to these additions.



When establishing a biofilter with fish, monitor TAN and nitrite levels daily to not exceed 1 ppm.

With or without fish, once TAN and nitrite levels have dropped to 0.5 ppm or lower and nitrate levels are detected, your biofilter is established.



**College of Agricultural, Consumer
and Environmental Sciences**
Cooperative Extension Service