



Aquaculture and Aquaponics: Which Is Right for You?

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Aquaculture and aquaponics share many similarities making it difficult to differentiate between the two. This publication highlights what makes each system unique and whether starting one may be suitable to your wants and needs.

What is aquaculture?

Aquaculture is the practice of raising aquatic organisms for commercial, recreational, educational or scientific purposes. It involves breeding, rearing and harvesting aquatic animals in various aquatic environments. Aquaculture may take place in ponds, raceways, oceans or tanks.

What is aquaponics?

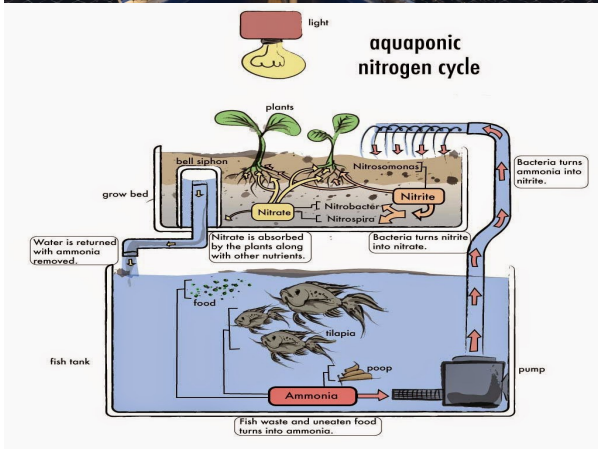
Aquaponics takes hydroponics to the next level. Instead of only growing plants in water, such as in hydroponics, aquaponics combines aquaculture and hydroponics to create a self sustaining system that consists of raising aquatic animals and growing terrestrial plants in water. Aquaponics uses the animal byproducts to fertilize and grow plants.

What differentiates aquaculture from aquaponics?

Aquaculture is the controlled farming of aquatic organisms. Aquaponics is typically an aquaculture system on a smaller scale, that includes both terrestrial plants and aquatic organisms.

Aquaponics is a type of aquaculture but it is important to differentiate between the two as they both attempt to mimic the aquatic organisms natural ecosystem. In aquaponic systems both the aquatic resources and the plants contribute to the nourishment of one another. It requires integrating individual components that will benefit the growth of both aquatic organisms and plants. Pumps and filters are utilized to transfer deoxygenated water from the fish tank into the grow bed so the plants may absorb the fish waste as nutrients. The plants filter the water so that it can be recirculated back into the fish tank.

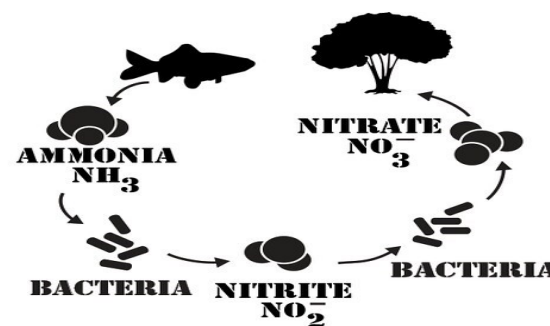
Aquaculture, most commonly used in Florida to raise ornamental fish or shellfish, does not typically include the growth of terrestrial plants within the system. Although aquatic plants may be grown in an aquaculture system, they are not often paired with the simultaneous growth of an animal as seen in aquaponics. Pumps and filters are used as the primary purification method for the water in aquaculture systems.



Benefits of an aquaponics system:

Aquaponics, like aquaculture, utilizes the naturally occurring nitrogen cycle as the nutrient source in the system instead of adding external fertilizers and chemicals.

1. Protein rich feed is given to the fish in the system. Fish waste and uneaten food produces ammonia that if not filtered properly could become dangerous to the fish.
2. Pumps and filters within the system remove waste from the tank. The ammonia is broken down by bacteria in a biological filter, into nitrite and eventually nitrate.
3. Nitrite and nitrate provide essential nutrients as it is absorbed by the plants roots. This absorption filters and cleans the water allowing it to safely be recirculated back into the fish tank.



Aquaculture	Similarities	Aquaponics
* Meets the growing demand for seafood by increasing food security and boosting seafood production * Reduces pressure on wild populations * Typically specializes in one aquatic organism	* Reduces environmental impacts such as water usage by incorporating recirculation * Reduces leaching, runoff and water discharge into environment * Can be done indoors or outdoors, during all seasons of the year, with proper temperature and lighting control	* Versatility in design allows for scalability if space is limited * Produces animals and plants simultaneously



Water quality:

Carefully monitoring water quality in aquaculture and aquaponics systems is essential to ensure the health of the aquatic animals and plants. Weekly testing of temperature, ammonia, nitrites, nitrates and pH levels is essential for preventative care. Each element of the system requires ideal conditions, therefore determining accurate levels will be based on the species of both plants and animals before they are selected for the system.

Is an aquaculture or aquaponics system right for you?

Incorporating an aquaculture or aquaponics system into your home, classroom or community could provide a multitude of benefits. It is important to consider the type of system, the species of aquatic organisms you wish to grow, and the system design before attempting aquaculture or aquaponics.

These systems allow for hands-on learning opportunities surrounding sustainable food production, biological life cycles and global water usage. They can also provide resources delivering fresh sustainable food to a variety of consumers. The food grown can be used at home to feed your family, provide the opportunity to donate to your community or even collect a profit from unused or unwanted production with proper permitting. The [Aquaculture Certificate of Registration](#) authorizes the production and sale of aquaculture products and is required to be renewed annually. Even if not used as a food source, these systems can be set up to provide entertainment or add beauty to your home or classroom, as often seen with home aquaponic systems.

Aquaculture and aquaponics systems can be used to grow a variety of plant and animal species depending on your needs and limitations. This versatility allows the opportunity to set up systems indoors or outdoors, increasing accessibility to individuals with limited space or resources.

The possibilities are endless!

Commonly used species in aquaculture:

Some commonly used species of aquatic plants in aquaculture are watercress and mangroves. Common aquatic animals include koi, minnows or carp. Florida's aquaculture industry is the nation's leader in product diversity and distribution.

Florida aquaculture is the top producer of ornamental freshwater species and third in the nation for shellfish production, among other accomplishments.

Commonly used species in aquaponics:

Pairing an aquatic animal and plant in an aquaponics system provides diversity in the aquatic organisms grown. High yield plants require more nutrients, therefore a larger system.

For aquaponics some commonly used species for aquatic animals include tilapia, guppies, tetras or catfish. Commonly used terrestrial plant species include lettuce, mint, basil or oregano.



For more information about aquaculture or aquaponics, visit the [Aquaculture Educators Resources](#) webpage.

Florida Department of Agriculture and Consumer Services