DACHNIK
Aquaponics

Revolutionizing the Aquaponics Industry

https://www.dachnikaquaponics.com

https://aquatic.farm

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Dachnik Aquaponics Highlights

- Most efficient bio-filter design (no external waste filtration equipment needed)
- Most efficient water movement and filtration
- Mimics the elements of soil and mother nature as closely as possible
- Combines both horizontal and vertical techniques
- Exclusive Growing Tower Design and Mobility
- Highest yield per Sqft
- Completely scalable
- Greatly limits labor and energy costs
- Requires less space
- Self-Balances PH

3-Trough Commercial - Single Cell

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3 Trough Commercial - Single Cell

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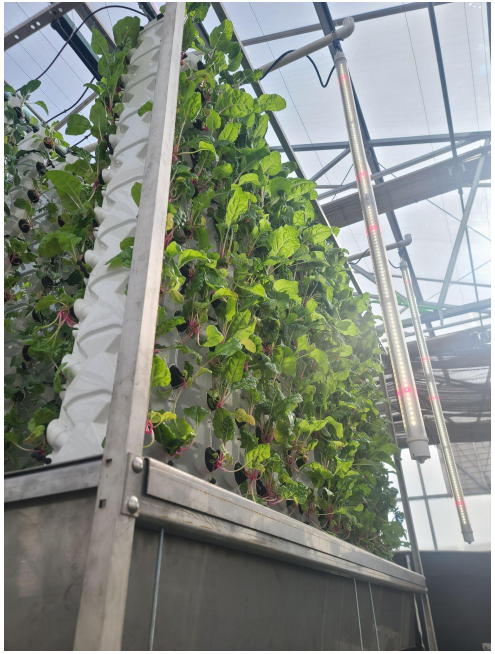

3 Trough Commercial - Single Cell

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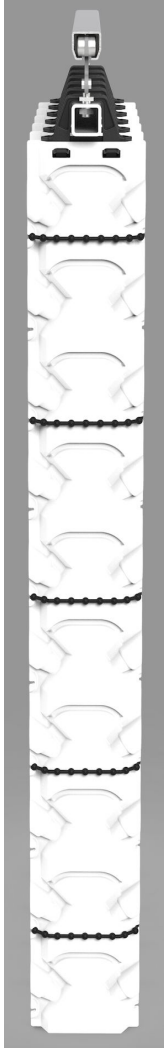

8-Cell Commercial Farm

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Our 8-cell commercial farm utilizes only a 2,000 Sq Ft footprint; and can harvest up to 10,880 plants per month, 10,000 lbs of fish per year, as well up to 1,200 lbs of crustaceans per year and is built to be easily scalable.

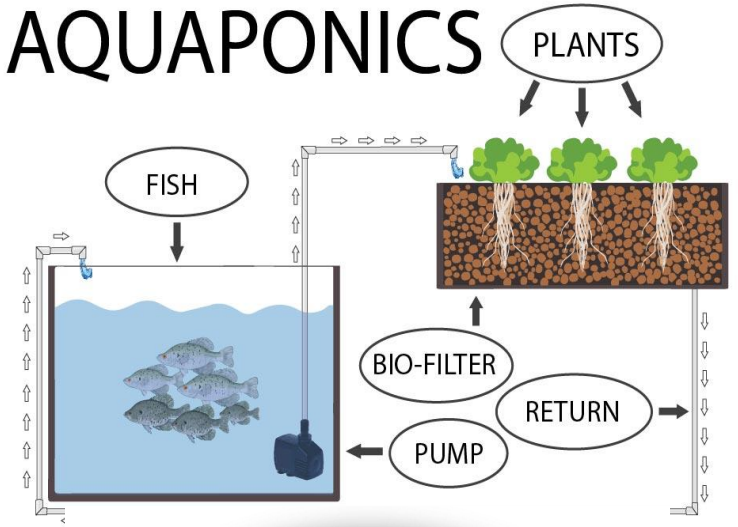
What is Aquaponics?

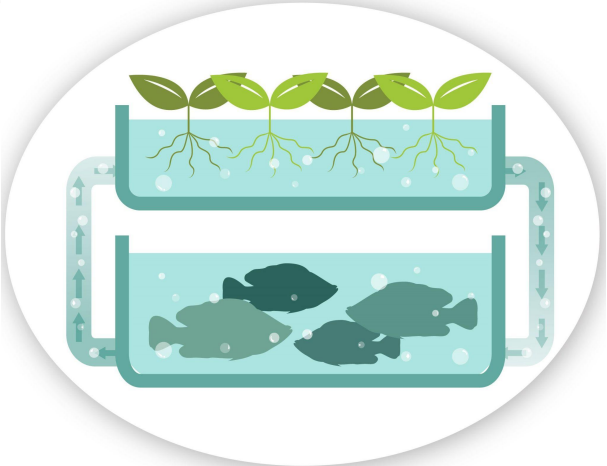
Like hydroponics, which is growing plants in water with a soil-less media, Aquaponics is its own growing method, connecting fish and plants in one environment.

Literally speaking, Aquaponics is putting fish to work. It just so happens that the work the fish do (eating and producing waste), creates the perfect fertilizer for growing plants.

Aquaponics mimics a natural ecosystem. It represents the harmony between water, aquatic life, and bacteria. The nutrient dynamics created are how plants thrive in waterways all over the world.

Taking clues from nature, aquaponics harnesses the power of bio-integrating these individual components: Exchanging the waste by-product from the fish as a food for the bacteria, to be converted into a perfect fertilizer for the plants, to return the water in a clean and safe form to the fish. Just like mother nature does in every aquatic ecosystem.





“Clean water is a precious resource and must be wisely managed by using “climate smart” practices. Irrigation claims 70% of water used. The excess water runoff from industrial farms is often contaminated with silt, pesticides, herbicides and fertilizers.

Aquaponics — Is the practice of growing vegetables & herbs in nutrient rich water provided by Fish/Worms. The plants thrive in the nutrient-rich system water, and are part of the purifying process for reuse — the plants absorb the nutrients and the “cleaned” water is returned to the fish tanks.

Studies have shown that aquaponics uses 90% less water than traditional farming. Unlike soil that quickly absorbs water, especially in warmer seasons, water used for aquaponics is continuously recirculated from the fish tanks to the plant beds.

Aquaponic systems are more water-efficient than traditional hydroponic systems. Our Aquaponic systems very rarely require complete water exchanges; compared to hydroponic systems that need to have full water changes every three months.” - **Water Usage in Recirculating Aquaculture/Aquaponic Systems**

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How Do Aquaponics Systems Save Water?

One of the critical components of aquaponics is water. It helps facilitate plant growth by carrying necessary nutrients from the fish waste to the grow beds. In setting up the system, the initial water requirements for aquaponics are quite large, but through the process of recirculation, it consumes less water than in soil gardening in the long run. Aside from this, there is also minimal water loss, so growers only have to add a little amount of water every week.

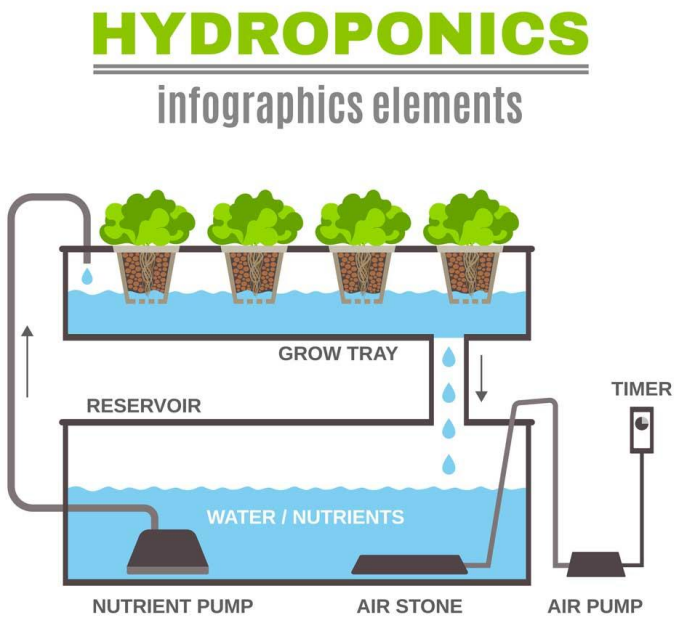
A research study conducted by the University of Gothenburg concluded that the process of recirculation in an aquaponic unit achieves 95% to 99% of water re-use efficiency. The water quality is maintained in the system despite the continuous usage, and it only required less than 100-liter per 1 kilogram of fish.

This result is also similar to the claim of Ouroboros Farm, in which they found that despite having a sizable aquaponic farm, they only used 60,000 gallons of water a year due to recirculation. As compared to a soil garden that can absorb more than 100 gallons a day depending on size, aquaponics is proving to be a reliable planting technique that can substantially reduce water usage in agricultural activities.

What is Hydroponics

Hydroponics solves many soil based issues. However, It also offers its own problems.

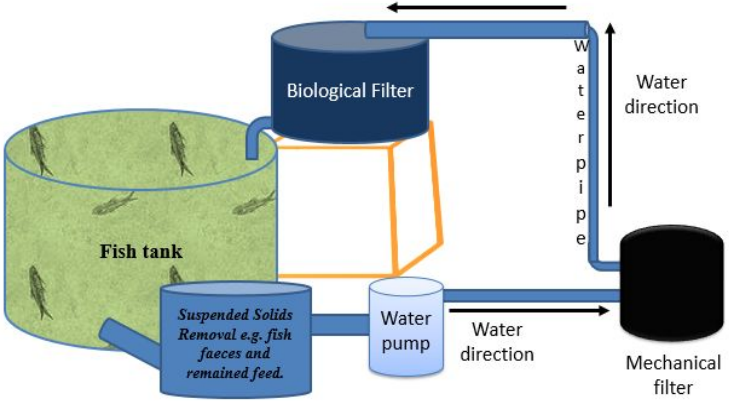
- Traditional hydroponic systems rely on the careful application of expensive, man-made nutrients made from mixing together a concoction of chemicals, salts and trace elements. In aquaponics, you merely feed your fish inexpensive fish feed, food scraps, and food you grow yourself.
- The strength of this hydroponic mixture needs to be carefully monitored, along with pH and total dissolved solids (TDS).
- Water in hydroponic systems needs to be discharged periodically. The salts and chemicals build up in the water, becoming toxic to the plants. This is both inconvenient and problematic as the disposal location of this wastewater needs to be carefully considered.
- Hydroponic systems are prone to a disease called “Pythium” or root rot. This disease is virtually non-existent in aquaponics.
- Provides only plants, no protein

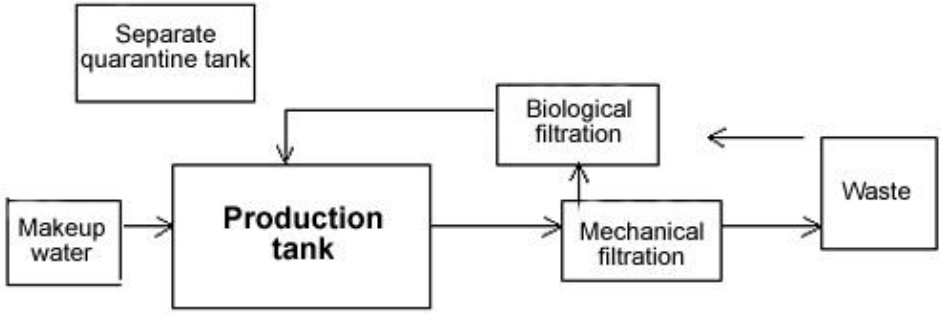


Recirculating Aquaculture (Fish Farms)

Most mainland fisheries are Recirculating Aquaculture Systems, or RAS, which tries to filter and reuse fish tank water. While RAS does attempt to address water conservation, it also brings its own issues:

- The tank water becomes polluted with fish effluent, giving off high concentrations of ammonia. Water has to be discharged at a rate of 10-20% of the total volume in the tank daily. This uses a tremendous amount of water. Again, in an aquaponics system, you never need to discharge your water
- This water is often pumped into open streams where it pollutes and destroys waterways.
- Because of this unhealthy environment fish are prone to disease and are often treated with medicines, including antibiotics. Fish disease is rare in an aquaponics system.





Commercial Aquaponics is Worth Solving

The basic issues with Aquaponics on a commercial scale is that it has proven to be very difficult to grow enough fish and produce in a relatively small space and be profitable at the same time.

Virtually all commercial Aquaponics systems only grow horizontally, and use mainly deep water culture; leaving the systems vulnerable and wasting valuable square footage by not growing vertically. This design results into high labor costs, high energy costs, low product yield per SqFt and an overall less healthy system.

This setup requires a very large greenhouse in order to achieve commercial level production and the energy and labor costs are too high to be sustainable over the long-term. This often prices the farmer out of the market, as they must sell their produce at a premium in order to break-even.

In these kind of systems the water is slow moving and all of the rows share the same water, which makes it subject to pathogens and anaerobic bacteria which raises ph and causes all kinds of problems for the farmer; as well as increases risk for cross contamination which could cease production for months. This type of setup creates many challenges for proper management

Dachnik Aquaponics has solved these challenges. Our design proves that aquaponics is scalable and has overcome the primary reasons for the technological stagnation in commercial aquaponics. That is why over the past decade many vertical farming companies and investment dollars have mostly gone into Hydroponics.

We know aquaponics is the key piece to the puzzle when it comes to sustainable food production on a world-wide scale

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Aquaponics Quotes

“Just one square metre gives you more yield than in one acre of land. That’s an ideal system for a developing country. [It] will produce up to 300 cucumbers a year.… A system like that can supply a family with fresh vegetables and with vitamins and also with protein” - **Dr. Nick Savidov, Aquaponics researcher and leader at the Aquaculture Centre of Excellence at Lethbridge College**

“You can convert 1.2kg of fish food into one kilo of fish. The lost 0.2kg is dissolved into nitrogenous waste. For every kilo of fish you rear, you grow about 10kg of plants and vegetables. All of a sudden, you’re producing a lot from very little.” “We are potentially taking a natural system that’s evolved over millions of years and we are just copying it, rather than exploiting it. While it can be seen as complex, it is incredibly simple.” - **Charlie Price**, **from the social enterprise Aquaponics UK**

“Only by adopting a mentality that focuses on maximizing conservation and ethical food production techniques, can we establish a future of production that works. We have to intensify production. But it needs intensifying the right way, not just relying on finite resources, because in the long run it won’t work. It’s a false economy, we’ll run out.” - **Antonio Paladino**, **Founder of Bioaqua, biggest integrated aquaponic trout farm in Europe**

“This is why we think aquaponics and vertical farming is the right combination. You are making the most effective use of space, while looking at food production holistically.” - **Kate Hofman,** CEO of GrowUp, London’s first aquaponics farm


Vertical Aquaponics System
in Greenhouse increases Production 10X

References

Greiner, A. D., Timmons, N. B., 1998. Evaluation of the nitrification rates of microbead and trickling filters in an intensive recirculating tilapia production facility. Aquacultural Engineering pp 189 - 200

Kamstra, A., Van der Heul, J.W., Nijhof, M., 1998. Performance and optimization of trickling filters on eel farms. Aquacultural Engineering pp 175-192

Saucier, B., Chen, S., Zhu, S., “Nitrification Potential and Oxygen Limitation in Biofilters” presented at the Third International Conference on Recirculating Aquaculture July 2000.

Timmons, M.B., Losordo, T. M., 1994. Aquaculture Water reuse Systems: Engineering Design and Management Elsevier Science B.V.

Zhu and Chen “An experimental study on nitrification biofilms performances using a series reactor system” Aquacultural Engineering 1999 Vol 23, p. 245 – 259.