Review of: "Aquaponics Unveiled: Efficient Household Farming"

Carlo Bibbiani[1]

1 University of Pisa

Potential competing interests: No potential competing interests to declare.

The paper is just a first introduction to aquaponics. Maybe readers get more curious and they hopefully enrich their knowledge on this system (trophic chain). To this regard, I think References are not updated. They cover a time span up to 2012. Great work has been done by many researchers in the last five years!

Moreover, the author doesn't refer to any available Manual available on the Web, such as
https://www.btlliners.com/what-is-aquaponics
or https://www.ctahr.hawaii.edu/uhmg/downloads/barrel-ponics.pdf
where you can find operative information.
In my opinion, even some 'Calculators' should be cited.
https://www.aquanet.com/calculators
Anyhow, the paper is well-written: I found out some improvements I wrote in comments.

I'd rather write ‘Fish feed’ instead of ‘Fish Food’ in any case.

“Figure 1” → **This is an external INPUT. The cycle is among Fish-Bacteria-Plants.**
So this Figure is misleading. Please, remove 'FISH FEED' from the loop and put it as external input.

"the fish consume the feed, which begins processing, or breakdown, of food into
protein for meat production (Figure 1). When digestion and breakdown of the food occur, waste is generated and excreted by the fish and enters the water, recirculating through the system"→ **Please, , rephrase this sentence; it is not clear enough.**

“These oxygen-dependent bacteria, crucial for nitrogen conversion, consume oxygen. Should dissolved oxygen levels drop below 6 mg/L, disruptions in ammonia transformation and the formation of oxygen-deprived zones within the media bed….” -→ **Oxygen level depends on water temperature. This threshold maybe should be expressed as 80% of saturation concentration.**

“The medium in which plants grow typically consists of a substrate, such asclay, formed into specific shapes, or any inert porous material that facilitates efficient drainage.” -→ **expanded-clay.**

"Conclusion
In conclusion, the wealth of information provided in this publication underscores the critical importance of a well-informed

approach to aquaponics system construction. Insightful decision-making and an understanding of the equipment and techniques are paramount. The guidance offered enables aquaponics practitioners to construct systems that are not only functional but also highly efficient." -→ **Instead of ‘ to construct’, you'd better say ‘make aware choices on’.**

In fact, there are no useful information about sizing any aquaponics system.

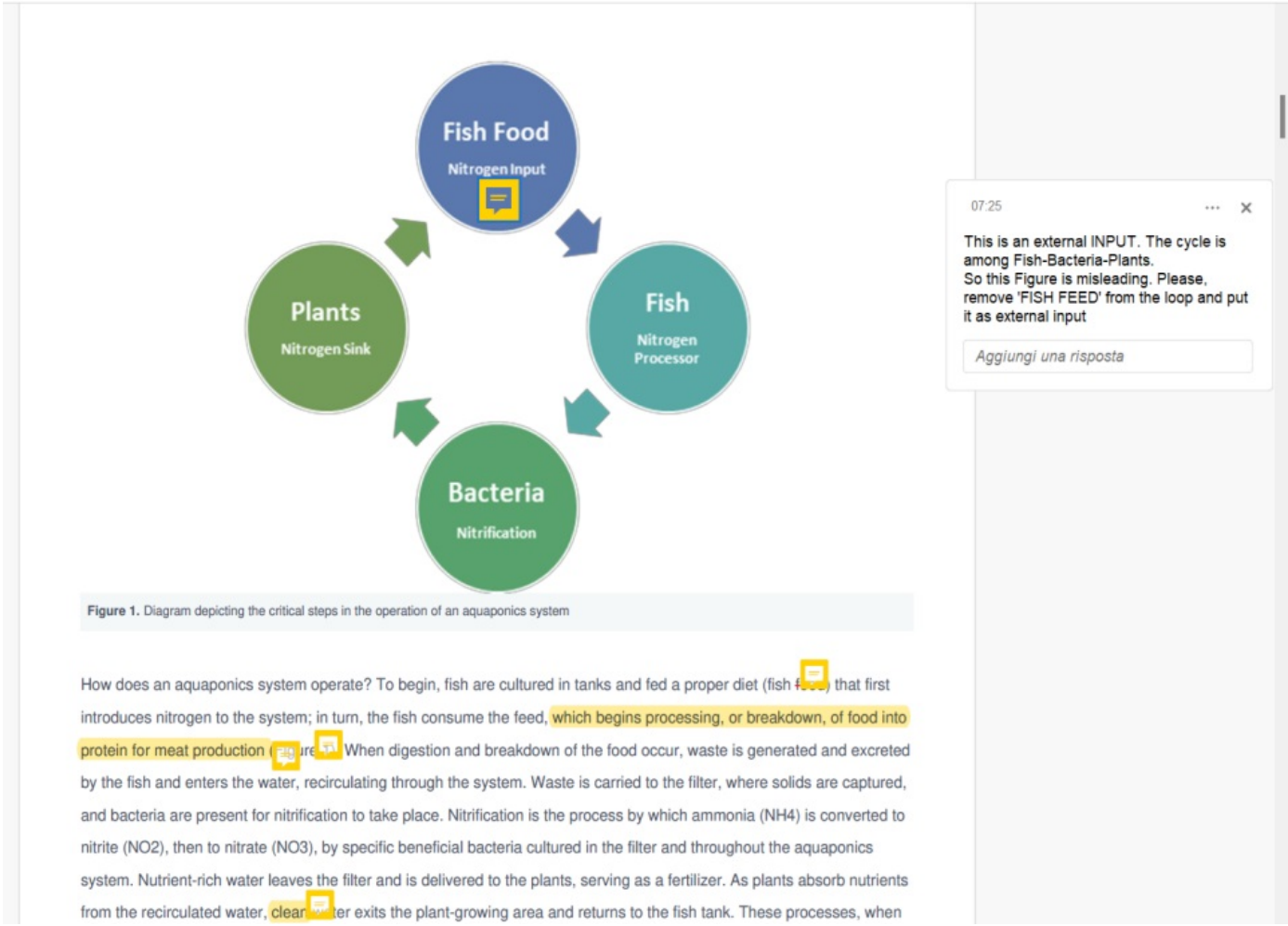

Figure 1. Diagram depicting the critical steps in the operation of an aquaponics system

How does an aquaponics system operate? To begin, fish are cultured in tanks and fed a proper diet (fish f… that first introduces nitrogen to the system; in turn, the fish consume the feed, which begins processing, or breakdown, of food into protein for meat production (…re…). When digestion and breakdown of the food occur, waste is generated and excreted by the fish and enters the water, recirculating through the system. Waste is carried to the filter, where solids are captured, and bacteria are present for nitrification to take place. Nitrification is the process by which ammonia (NH_4) is converted to nitrite (NO_2), then to nitrate (NO_3), by specific beneficial bacteria cultured in the filter and throughout the aquaponics system. Nutrient-rich water leaves the filter and is delivered to the plants, serving as a fertilizer. As plants absorb nutrients from the recirculated water, clear…er exits the plant-growing area and returns to the fish tank. These processes, when