

## Biofloc System: A Sustainable Solution for Feed Shortage

**Manal MA Mahmoud\***

*Department of Nutrition and Clinical Nutrition, Faculty of Veterinary Medicine, Suez Canal University, Ismailia, Egypt*

**\*Corresponding Author:** Manal MA Mahmoud, Department of Nutrition and Clinical Nutrition, Faculty of Veterinary Medicine, Suez Canal University, Ismailia, Egypt.

**Received:** July 18, 2022

**Published:** October 01, 2022

© All rights are reserved by **Manal MA Mahmoud.**

The world is facing a food shortage crisis due to climate change, pollution, and growing population. We need to find efficient, sustainable, cost-effective solutions to feed animals and fish.

Aquacultures provide us with healthy animal protein of high quality. Likewise, creating employment and economic growth. Biofloc Technology (BFT) is a water treatment technology used in aquaculture. In this system nutrients are reused with the lowest water exchange.

BFT is an approach to solve the problems of water pollution by lowering the density of the toxic components. In addition, it avoids contamination as heterotrophic bacteria inhibit the growth of pathogenic bacteria. It can reduce or eliminate the water exchange in the ponds, maximizing the use of water sources. It allows the increase in population of cultured species without increasing the space.

The biofloc bacteria optimally use nutrients in the pond, diminishing the cost of feed. Therefore, the biofloc system can work as food when feed prices are high and feed is scarce [1].

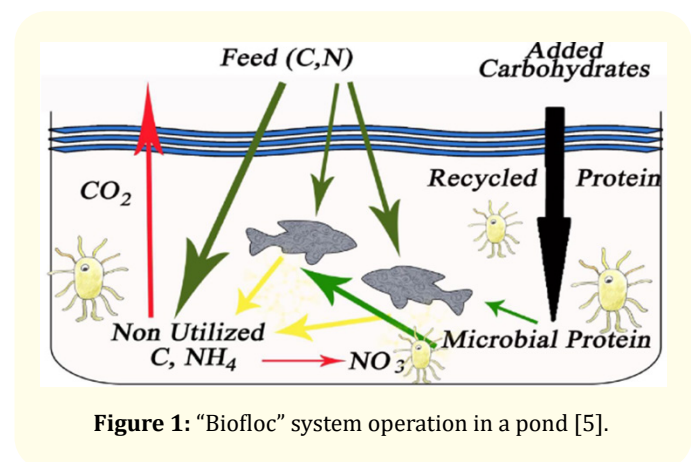
Higher productivity was reported with BFT when compared to conventional aquaculture techniques. BFT reduced mortality rates, improved performance, and feed efficiency in the cultured species [2].

Studies have shown that bottom-dwelling species such as shrimp and tilapia are suitable for biofloc production [2].

The technique is based on maintaining a higher C-N ratio by the addition of carbohydrates. The improvement of water quality is due to the production of good quality single-cell microbial protein [3].

Biofloc is composed of 60 to 70% organic matter such as fungus, algae, protozoa, and rotifers. In addition, 30 to 40% inorganic matter as colloids, organic polymers, and dead cells [4].

BFT has great potential. For example, it is an eco-friendly culture system that maximizes the use of land and water, diminishes the danger of introduction and spread of pathogens, reduces the use of protein supplement feed, and the cost of regular feed.



**Figure 1:** "Biofloc" system operation in a pond [5].

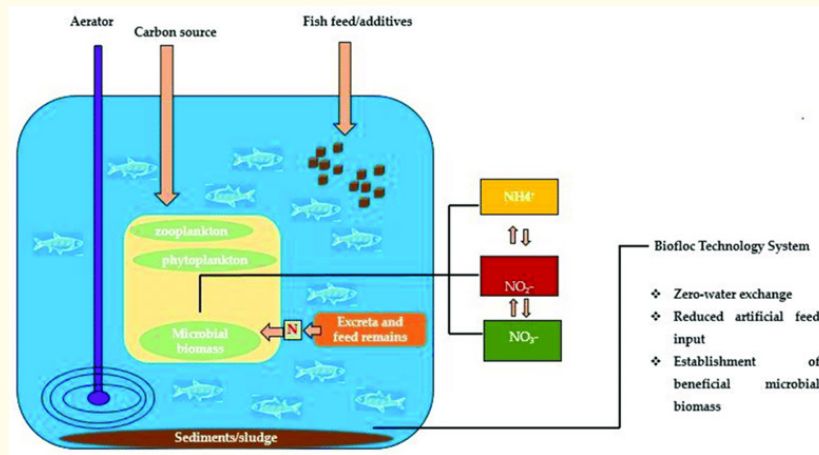


Figure 1: Schematic diagram of a biofloc technology system [6].

## Bibliography

1. Castro-Nieto L., *et al.* "Biofloc systems: a technological breakthrough in aquaculture". *El Hombre y su Ambiente* 1.1 (2012): 1-5.
2. Shrestha R. "Biofloc Technology" (2022).
3. Tong R., *et al.* "Effects of feeding level and C/N ratio on water quality, growth performance, immune and antioxidant status of *Litopenaeus vannamei* in zero-water exchange bioflocs-based outdoor soil culture ponds". *Fish and Shellfish Immunology* 101 (2020): 126-134.v
4. Chu C and D Lee. "Multiscale structures of biological flocs". *Chemical Engineering Science* 59.8-9 (2004): 1875-1883.
5. Avnimelech Y. "Biofloc technology: a practical guide book". World Aquaculture Society (2009).
6. Mugwanya, M., *et al.* "Biofloc systems for sustainable production of economically important aquatic species: A review". *Sustainability* 13.13 (2021): 7255.