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Aquamimicry: Concept and Application for Sustainable Aquaculture

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The aquaculture sector has experienced significant growth globally and this sector is being considered as blue revolution for healthy people. To do this, aquaculture is being increasingly intensified for increasing production which ultimately causes different unexpected problem like diseases, environment degradation and economic losses, making this sector unsustainable. In this regard, Aquamimicry is a strategy developed to address the significant challenges posed by modern intensive aquaculture. It is an innovative approach that emulates natural aquatic ecosystems and biological processes to improve ecological balance and resource efficiency.

This concept emphasizes the design of aquaculture systems that reflect the functionality of natural ecosystems, promote biodiversity, minimize waste, and utilize natural interactions among species. Aquamimicry functions by fostering synbiosis through the utilization of prebiotics (fermented carbon sources) and probiotics, hence enhancing zooplankton production and recreating natural conditions. The advantages of aquamimicry are many, encompassing reduced environmental impacts, increased resilience to diseases, improved economic viability through lower resource inputs, and enhanced consumer appeal. Previous research showed that the weekly survival rate (Fig) indicated that the shrimp had a higher survival rate in aquamimicry pond T_2 (30% Liquid Fermented Rice Bran) than in ponds T_1 (10% Liquid Fermented Rice Bran) and T_0 (Improved traditional; No fermented liquid fermented rice bran).

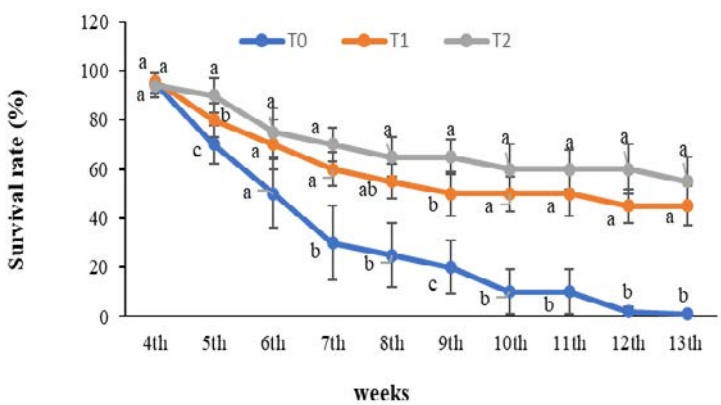

Figure: Weekly survival rate (%) of black tiger shrimp (*P. monodon*) in control and aquamimicry ponds.

This results also minimizes reliance on commercial feeds and indicated as suitable method for waste recycling. However, key challenges such as the lack of knowledge of the system, initial investment, uncertainties in commercialization and complex management must be addressed. Future directions includes further research to improve species interactions, the incorporation of intelligent technologies for system monitoring, and the establishment of supportive policies to promote the adoption of sustainable practices. Overall, aquamimicry offers a feasible way that fosters sustainable aquaculture, aligning production with ecological principles to preserve aquatic ecosystem health.