

# *Polychaete Worms: A Nutrient-Rich Feast for Shrimp Brooders*

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## **ABSTRACT**

This article delves into the unexplored possibilities of utilizing polychaete worms as a nutrient-rich dietary option for shrimp brooders in aquaculture. The nutritional makeup of polychaete worms, encompassing proteins, lipids, vitamins and minerals, positions them as an excellent dietary supplement for fostering the growth and reproduction of shrimp brooders. The introduction of polychaetes into the diet has exhibited promising outcomes, enhancing reproductive performance by elevating spawning frequency and increasing hatching rates. We discuss the viability of large-scale polychaete cultivation, along with their environmental and economic advantages, and the challenges associated with their integration. The article underscores the importance of research, innovation, and regulatory frameworks to fully unlock the potential of polychaete worms in revolutionizing shrimp aquaculture. Integrating these worms into the diets of shrimp brooders offers a sustainable and nutritious solution, aligning with the industry's escalating demand for responsible and eco-friendly practices.

## INTRODUCTION

In the ever-evolving landscape of aquaculture, the search for optimal nutrition for shrimp brooders has led researchers and farmers to explore unconventional yet highly nutritious sources. One such hidden gem is the polychaete worm, a marine invertebrate that has gained attention for its potential as a superior food source for shrimp brooders. In this article, we will delve into the nutritional benefits and the feasibility of incorporating polychaete worms into the diet of shrimp brooders.



### **Polychaete Worms: A Nutritional Powerhouse**

Polychaete worms, commonly found in marine environments, that are rich in essential nutrients required for the growth and reproduction of aquatic organisms. These worms are packed with proteins, lipids, vitamins, and minerals, making them an ideal dietary supplement for shrimp brooders. The amino acids present in polychaetes contribute to the development of muscle tissues and enhance the overall health of the shrimp. Moreover, polychaetes contain omega-3 fatty acids, which play a vital role in reproductive success and the development of healthy offspring. The high nutritional value of polychaete worms makes them a holistic and well-rounded food option for shrimp brooders (Sahu *et al.*, 2017).

### **Enhanced Reproductive Performance:**

The reproductive success of shrimp brooders is an essential requirement in aquaculture and the inclusion of polychaete worms in their diet has shown promising results (Tirado, 1996). The nutrients present in these worms contribute to the maturation of reproductive organs and the production of high-quality eggs. Shrimp brooders fed with a diet supplemented with polychaetes have exhibited increased spawning frequency and higher hatching rates, ultimately leading to improved larval survival.

### **Feasibility of Incorporation:**

While the nutritional benefits of polychaete worms for shrimp brooders are evident, the practicality of incorporating them into aquaculture operations is equally important. Polychaetes are known for their resilience and adaptability, making them relatively easy to culture. This adaptability reduces the risk of disease outbreaks and ensures a stable and consistent food source for shrimp brooders. Cultivating polychaete worms can be done using various methods, including simple pond culture systems or more sophisticated recirculating aquaculture systems (RAS) (Gomez *et al.*, 2019). The feasibility of large-scale polychaete production makes them an accessible and sustainable option for shrimp farmers looking to enhance the nutritional profile of their brooders' diet.

### **Environmental and Economic Benefits:**

In addition to their nutritional value, the cultivation of polychaete worms brings forth environmental and economic benefits. These worms contribute to nutrient recycling in aquaculture systems, helping maintain water quality. Furthermore, the cultivation of polychaetes can serve as an additional revenue stream for farmers, diversifying their income

sources and promoting a more sustainable approach to shrimp farming.

### Challenges and Considerations:

While the prospect of integrating polychaete worms into the diet of shrimp brooders is promising, it's crucial to acknowledge potential challenges and considerations. One significant consideration is the need for proper management practices in polychaete cultivation to ensure consistent quality and quantity. Controlling environmental factors such as temperature, salinity, and substrate quality becomes essential to maintain optimal worm growth and nutritional content. Studies have shown that polychaetes can harbor pathogens such as the White Spot Syndrome Virus (WSSV) and Enterocytozoon hepatopenaei (EHP). These pathogens can be transmitted to shrimp broodstock through ingestion of infected polychaetes (Desrina *et al.*, 2018). So, careful monitoring while cultivation is required. Moreover, the development of cost-effective and efficient feeding strategies for polychaetes is essential to make their inclusion in shrimp brooder diets economically viable. Research and innovation in this area will contribute to the scalability of polychaete cultivation and make it more accessible to a broader range of shrimp farmers.

### Regulatory Considerations:

As the use of polychaete worms in aquaculture gains attraction, regulatory frameworks need to be established to ensure the safety and sustainability of their production and utilization. Guidelines on the maximum inclusion levels in shrimp diets, monitoring of potential contaminants, and environmental impact assessments will contribute to responsible and ethical practices in the industry.

### CONCLUSION:

In conclusion, the incorporation of polychaete worms into the diet of shrimp brooders represents a promising avenue for improving shrimp health and reproductive performance. The nutritional richness of polychaetes, coupled with their adaptability and potential environmental benefits, positions them as a valuable resource in aquaculture. However, realizing this potential requires a collaborative effort from researchers, farmers, and policymakers to address challenges, refine cultivation techniques, and establish regulatory frameworks. With ongoing research and development, polychaete worms have the potential to revolutionize shrimp aquaculture, offering a sustainable and nutritious solution that aligns with the growing demand for responsible and eco-friendly practices in the industry. As the aquaculture community embraces innovation, the inclusion of polychaete worms may very well become a standard practice in optimizing shrimp brooder nutrition and reproductive success. As the aquaculture industry continues to explore innovative approaches to sustainable and efficient practices, the incorporation of polychaete worms into the diet of shrimp brooders stands out as a nutritional breakthrough with far-reaching benefits.

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