

Investigating economical aquaculture improvement employing a nutrition sensitive approach

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Introduction

Sustainable lipid sourcing and the development of alternative lipid sources are priorities for the industry. Carbohydrates in aquaculture feeds are often derived from plant-based ingredients. The selection of carbohydrate sources should consider the species' digestive physiology. Aquaculture feeds are supplemented with vitamins and minerals to ensure that the dietary requirements of the species are met. Research into alternative protein sources, such as insect meal and single-cell protein, aims to reduce the industry's reliance on fishmeal and soybean meal. Probiotics, prebiotics, and other feed additives derived from microbial sources are being explored to enhance digestion and disease resistance. Research into genetically modified fish that grow faster and require less feed is ongoing, but regulatory challenges and public perception must be addressed. Nutrigenomics explores how genetics influence the dietary requirements of aquatic species. Tailoring feeds to the specific genetic makeup of the fish can improve growth and health. Utilizing sensor technology and automated feeding systems, aquaculturists can provide the right amount of feed at the right time, reducing waste and optimizing growth. RAS allows for water reuse and efficient nutrient recycling, reducing the environmental impact of aquaculture. Ensuring sustainable sourcing of feed ingredients, particularly proteins and lipids, remains a challenge as the industry grows.

Description

As aquaculture expands, it must minimize its environmental impact, including waste generation and nutrient runoff. Disease outbreaks can have devastating effects on aquaculture operations. Developing feed additives and management practices to enhance disease resistance is essential. Public perception of Genetically Modified Organisms (GMOs) and other innovative approaches can affect their acceptance and adoption. The development and adoption of international regulations for aquaculture nutrition and sustainable sourcing of ingredients are ongoing challenges. Sustainable

aquaculture nutrition seeks to balance the industry's need for growth with the preservation of environmental resources and the provision of healthy, nutritious seafood. Developing alternative protein and lipid sources and improving feed efficiency to reduce the industry's reliance on wild-caught fish as feed.

Conclusion

International collaboration and regulatory frameworks will be essential to address common challenges in aquaculture nutrition and sustainability. The aquaculture industry will continue to prioritize environmental responsibility, including reducing waste and mitigating the environmental impact. Educating consumers about the importance of sustainable aquaculture practices and their role in preserving the health of our oceans and the quality of seafood products. Aquaculture nutrition is a dynamic field with a profound impact on global food security, environmental sustainability, and human health. The development of innovative feed ingredients, sustainable sourcing practices, and responsible aquaculture management is essential for the industry's continued growth. By prioritizing the nutritional needs of aquatic species and the sustainability of aquaculture practices, we can ensure a thriving and responsible industry that nourishes both people and the planet.

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Conflict of Interest

The author declares there is no conflict of interest in publishing this article.

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