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Prospects and Challenges of Nanochitosan Application in Aquaculture

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Nanochitosan-Based Enhancement of Fisheries and Aquaculture

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Abstract

The fishery and aquaculture industries are dealing with more issues pertaining to sustainability, disease control, and environmental impact as the demand for seafood around the world rises. The unique properties and versatility of nanochitosan have made it a promising solution to these problems. The potential uses and difficulties of nanochitosan in fisheries and aquaculture systems are examined in this chapter. The prospects of nanochitosan in these industries are multifaceted. Through targeted drug delivery, improved disease management, and optimized feed efficiency, they present opportunities for sustainable aquaculture practices. Nanochitosan also holds promise in environmental remediation, customized aquaculture solutions, and eco-friendly pesticide applications. However, several challenges must be addressed to fully realize the potential of nanochitosan in fishery and aquaculture. Regulatory approval and safety assessments are essential to ensure the responsible use of these nanoparticles. Cost-effectiveness and scalability of production methods must be achieved to meet industry demands. Concerns about nanoparticle accumulation in aquatic organisms and long-term ecological impacts necessitate more comprehensive research.

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