

## Recent Nano technological Advancements in Antimicrobial Edible Films for Food Packaging: A Review

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**Abstract :** Researchers are now focusing on sustainable advancements in active packaging systems to meet the growing consumer demand for high-quality food with Eco-friendly packaging. One significant advancement in this area is the inclusion of antimicrobial agents in bio-polymer-based edible films, which effectively inhibit or kill pathogenic/spoilage microbes that can contaminate food. This technology also helps reduce undesirable flavors caused by active compounds directly incorporated into the food. To further enhance the efficiency of antimicrobial bio-based packaging systems, Nano technological concepts such as bio-nano composites and Nano encapsulation systems have been applied. This review examines the current state and applications of antimicrobial biodegradable films in the food packaging industry, while also highlighting ongoing research on the use of nanotechnology to develop innovative bio-based packaging systems.

**Keywords :** active packaging, antimicrobial edible films, bioactive agents, biopolymers, bio-nanocomposites

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