عنوان مقاله:

Reduction of Listeria monocytogenes and Bacillus cereus in Milk by Zinc Oxide Nanoparticles

محل انتشار:

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خلاصه مقاله:

Background & Objectives: Direct addition of antimicrobial materials to food during food processing is an effective method for controlling microbial contaminants of food and extending the shelf- life of food products. Objective of this research was to study the antimicrobial effect of zinc oxide (ZnO) nanoparticle and potential applications of ZnO nanoparticles in terms of controling two food-borne pathogens in milk. Methods: Toxicity of different concentration (0, 0.5, 2, 5, and 10 mM) of ZnO nanoparticles on Listeria monocytogenes and Bacillus cereus was studied in culture media and milk.Results: Among the mentiond concentrations, treatment of 10 mM of ZnO nanoparticle was the most effective one for L. monocytogenes and B. cereus inhibition, which completely inhibited the growth of L. monocytogenes and B. cereus in 24h. These data revealed concentration-dependency of the antibacterial activity of ZnO. Therefore, 5 mM and 10 mM ZnO were selected for further studies, which were performed in milk, since they demonstrated significant growth inhibition. ZnO NPs were more capable in terms of reducing the initial growth counts of all the above-stated strains in milk. Conclusion: ZnO nanoparticles had an antimicrobial activity against L. monocytogenes and B. cereus in milk and the media. This work was a preliminary study that provided a starting point for determining whether the use of ZnO nanoparticles had the potential for being applied in food preservation or not.

کلمات کلیدی:

Listeria monocytogenes, Bacillus, Zinc Oxide, Nanoparticles