

## Synergistic effect of gamma ( $\gamma$ )-irradiation and microencapsulated antimicrobials against *Listeria monocytogenes* on ready-to-eat (RTE) meat

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### Highlights

- Microencapsulation was found to be an effective technology.
- $\gamma$ -Irradiation showed a synergistic effect with microencapsulated antimicrobials.
- Microencapsulated antimicrobials reduced the growth rate of *Listeria monocytogenes*.
- Microencapsulated cinnamon EO and nisin showed the best antimicrobial effect.

### Abstract

Oregano essential oil (*Origanum compactum*; 250  $\mu\text{g/ml}$ ), cinnamon essential oil (*Cinnamomum cassia*; 250  $\mu\text{g/ml}$ ) and nisin (16  $\mu\text{g/ml}$ ) were used alone or in combination to evaluate their efficiency to inhibit the growth of *Listeria monocytogenes* on RTE ham. Microencapsulation of the antimicrobial formulations was done to verify the potential effect of the polymer to protect the antimicrobial efficiency during storage. Combined treatments of antimicrobial formulation with  $\gamma$ -irradiation were done to verify