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Use of *Plantago major* seed mucilage as a novel edible coating incorporated with *Anethum graveolens* essential oil on shelf life extension of beef in refrigerated storage

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Highlights

- *Plantago major* seed mucilage (PMSM) extended the shelf life of beef.
- PMSM incorporated with *Anethum graveolens* essential oil extended the shelf life of beef.
- PMSM could be an effective coating material for beef.
- PMSM coatings suppressed bacteria and fungi growth in beef
- Thiobarbituric acid (TBA) and peroxide value (PV) correlated well with the microbiological data and sensory characteristics.

Abstract

In this study, *Plantago major* seed mucilage (PMSM) was extracted from whole seeds using hot-water extraction (HWE). The dill (D) essential oil components were identified through gas chromatography (GC) and gas chromatography/mass spectrometry (GC/MS) and its antioxidant properties were examined through the methods of 2,2-diphenyl-1-picrylhydrazyl (DPPH), ferric reducing antioxidant potential (FRAP) and β -carotene-linoleic acid assay (B-CL). Total phenolic content (TPC) was characterized through the Folin-Ciocalteu method and the antimicrobial effect was evaluated on 10 pathogenic microorganisms. PMSM edible coating incorporated were prepared in four different concentrations of essential oils, including 0, 0.5, 1 and 1.5% (w/w). The control and the coated beef samples were analyzed periodically for microbiological (total viable count,

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