

Abstract of the MSc thesis 11499, The Faculty of Veterinary Medicine of Urmia University.

Author: Mahsa Heidari

Title: Preparation and application of chitosan coating containing nano-encapsulated of (*Vitis vinifera* L. var. Ghizil Uzum) seed extract on meat

Abstract:

Meat and meat products are among the food items that easily spoil and become contaminated if not properly packaged and stored. Nowadays, the use of plant extracts and essential oils to improve sensory properties and increase the shelf life of food products has gained significant attention. Natural preservatives quickly oxidized, resulting in the appearance of brown color and unwanted odors, reducing their nutritional value. Additionally, many of these compounds are insoluble in water and have an unpleasant taste, which needs to be coated before using them in food or pharmaceutical products. Nanoencapsulation is a powerful method for preserving these compounds, as it allows for their preservation by placing them in a protective matrix. In this study, the microbiological, chemical, and sensory qualities of refrigerated beef coated with a chitosan solution containing nanoencapsulated extract of red grape seeds were investigated. Extraction was performed using a soaking method, and nanoemulsion was prepared using a low-energy method and stored in the refrigerator. The nanoemulsion was analyzed for a period of 3 weeks. According to the results, the size of the nanoemulsion particles prepared with Tween 20 and Tween 80 emulsifiers showed that the nanoemulsion prepared with Tween 80 had a smaller size and reached 16 nanometers during the 21-day storage, indicating the stability of the nanoemulsion. Based on the obtained results, the chitosan coating containing nanoencapsulated extract of red grape seeds showed various changes in the beef during the storage period. Microbiological evaluation showed that the coating had a significant effect on reducing bacterial growth during the 16-day storage at a temperature of 1 ± 3 degrees Celsius. Moreover, samples treated with the nanoemulsion showed a significant reduction in pH, TVN, and TBA values. Finally, in sensory evaluation, better results were observed for treatments containing 1% extract-loaded nanoencapsules. Based on the microbiological, chemical, and sensory results, chitosan coating and nanoencapsulated extract of grape seeds can preserve the quality characteristics and increase the shelf life of meat during refrigeration.

Keywords: Beef, Coating, Grape seed extract, Nanocapsulation, Shelf life.