



**TITLE:** The composite film of gelatin-pullulan containing SALMONELEX™ for bio-control  
*Salmonella* bacteria

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**ABSTRACT (up to 300 words)**

According to emergence of resistance bacteria to antibiotics in the food industry, the application of bacteriophages may be a solution due to their specific function on goal bacteria. In this study, composite film of gelatin-pullulan loaded with bacteriophages was prepared, and mechanical, water vapor permeability, and transparency properties of film were investigated. As well as, its anti-bacterial activity against *Salmonella typhimurium* and *Salmonella enteritidis* on agar media and meat was studied. The results showed that incorporation of phages into film increased elongation at break and transparency, while water vapor permeability did not have significant changing. Anti-bacterial activity of film on the media agar and beef meat at 10 °C temperature against *Salmonella typhimurium* were higher than *Salmonella enteritidis*. Population of *S. typhimurium* and *S. enteritidis* on the beef meat decreased 1.5 log unit (CFU/g) and 0.8 log unit (CFU/g) after 24 h compare to control groups, respectively. This edible film containing phages as a bio-control approach can improve quality and food safety on the matrix food against *Salmonella* pathogen bacteria, especially since it works exclusively.

**BIOGRAPHY (up to 200 words)**

Asma Entezari is a Ph. D student at Ferdowsi University, Iran. She has one publication about extending shelf life and control *Salmonella* in egg. She is working on phages and bio-packaging, also two papers are ready to send journal. She had a visiting study at Universidad de Córdoba (Spain) in 2022. Moreover, she has participated in concluding an international memorandum of understanding between Ferdowsi University and Universidad de Córdoba.

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