

Title The antimicrobial effect of oregano essential oil, nisin and their combination against *Salmonella* Enteritidis in minced sheep meat during refrigerated storage

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Abstract

The antimicrobial effect of oregano essential oil (EO) at 0.6 or 0.9%, nisin at 500 or 1000 IU/g, and their combination against *Salmonella* Enteritidis was studied in minced sheep meat during storage at 4° or 10 °C for 12 days. Sensory evaluation showed that the addition of oregano EO at 0.6 or 0.9% in minced sheep meat was organoleptically acceptable, and attribute scores were higher for the EO at 0.6 than 0.9%. According to compositional analysis of the oregano EO, the phenols carvacrol (80.15%) and thymol (4.82%) were the predominant components. Treatment of minced sheep meat with nisin at 500 or 1000 IU/g, proved insufficient to act against *S. Enteritidis*. The combination of the oregano EO at 0.6% with nisin at 500 IU/g showed stronger antimicrobial activity against *S. Enteritidis* than the oregano EO at 0.6% but lower than the combination with nisin at 1000 IU/g, which in turn was lower than that of the oregano EO at 0.9%. In its turn, oregano EO at 0.9% showed lower antimicrobial activity than its combinations with nisin at 500 or 1000 IU/g, which showed a bactericidal effect against the pathogen. The inhibition percentages of all treatments against *S. Enteritidis* at 10 °C were higher than those at 4 °C.