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Risk Assessment of *Staphylococcus aureus* enterotoxin A in Meat

A Thesis

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Abstract

(Key words: Lactic acid, RT-PCR, SEA, *sea* gene expression, *Staphylococcus aureus*, SYBER Green I)

The *Staphylococcus aureus* enterotoxin A (SEA) is the toxin mostly involved in *Staphylococcus aureus* (*S. aureus*) food poisoning. In this study, the effect of different lactic acid (LA) concentrations (LA 1% and 2%), lysozyme concentrations (100 mg/ml and 200 mg/ml) and temperatures (4°C, 25°C, and 37°C) on *S. aureus* growth and relative *sea* expression in fresh meat cuts were studied. Real-Time PCR (RT-PCR) was used to determine relative *sea* expression. Fresh meat cuts were inoculated with 10⁵ CFU/g of *S. aureus* producing enterotoxin A. Thus, *S. aureus* growth and relative *sea* expression were regularly tested for 48 hours. The growth of *S. aureus* was decreased by one log CFU/g than control sample using 1% LA and 2% LA (5.32 ± 3.76 log CFU/g, 4.38 ± 3.00 log CFU/g and 4.54 ± 3.18 log CFU/g

respectively) while, the use of 100 mg/ml and 200 mg/ml lysozyme decreased the counts to be 4.95 ± 3.77 log CFU/g and 4.98 ± 3.99 log CFU/g, respectively. Relative expression of the *sea* gene in both lysozyme and LA concentrations was lower than control. Moreover, both lactic acid and lysozyme concentrations had an effect on relative *sea* gene expression at all examined hours, especially at 4°C compared to control samples. The higher the lactic acid concentration, the lower the *S. aureus* enterotoxin A relative expression was, lysozyme as well.

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