

Food safety and Hygiene

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Potentially effective disinfection of hatching and table eggs with combined steam and ultrasound treatment

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Background: SonoSteam is a minimally decontamination technology that uses the combined effect from steam at 90°C and ultrasound at 25-35 Hz. This system has been designed to reduce levels of pathogenic bacteria on raw meat products such as poultry. On poultry, the system reached approximately 1 log reduction based on previous factory trials. This same technology is now being investigated on table eggs for consumption as well as for decontamination of hatching eggs.

About this study: Combined steam ultrasound treatment was investigated on artificially contaminated table and hatching eggs with levels around 5 Log of Salmonella and Enterobacteriaceae. A small-scale testing prototype was used and experiments were conducted using treatment times of 1.0, and 1.5 seconds at 90-96°C. Sensory evaluations were conducted over a period of 12 weeks with 72 eggs tested every week, using a food texture analyzer (TA-Xt analyzer by Texture Technologies). Tests included egg weight, yolk

and albumin height, vitelline membrane strength, shell breaking strength and Haugh Unit. Hatching frequency was determined in a large experiment with 504 hatching eggs in total. Each of the groups (control, 1.0s and 1.5s) were assigned 168 eggs for comparison.

Results: Results showed complete reduction of Salmonella and Enterobacteriaceae at 1.0s. The results showed no changes in egg quality compared to control untreated eggs. Furthermore, results suggested the hatching frequency of the treated samples were no different than the controls. In all cases, a hatching frequency of 88% was observed.

Speaker Biography

Hanieh S Musavian has completed her master's degree in biotechnology at the age of 22 years from Technical University of Denmark. Current position as R&D Project manager and specialist at FORCE Technology (an GTS Institute) which is an independent not-for-profit organization located in Denmark.

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