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Factory trials and evaluations of steam-ultrasound (SonoSteam®) decontamination of broilers

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S team-ultrasound (SonoSteam*) decontamination is a minimally process that uses the combined effect from steam at 90°C and ultrasound at 25-35 kHz to reduce microbes on food and non-food surfaces. The technology applies patented nozzles that produce the combined effect from steam-ultrasound simultaneously. A specially constructed treatment chamber that enhances the combined effect from the nozzles was built in an industrial scale system for poultry disinfection. Since late 2014, this system has been installed and optimized at five different slaughter lines in three different European broiler slaughterhouses with capacities of 11.000-13.500 birds/hour. Ongoing weekly trials with 10-20 *Campylobacter* positive birds were sampled. Sampling technique includes 10 g of paired skin samples from neck and breast area. The system is monitored using temperature probes inside the chamber. A silicone dummy molded into a chicken carcass with temperature probes sitting around the surfaces was also applied to monitor system stability. Results from temperature profiles showed process stability inside chamber as well stability in steam flow around chickens entering and exiting process chamber. Microbial results showed approximately 0.7-1.2 log on average on birds with highest levels (>1000 CFU). The data suggest a correlation between initial levels and the achieved reductions, whereas the lowest reductions are found on birds infected with levels around 1.5 log. This study is a summary of the progress on the industrial application of SonoSteam* disinfection of broilers.



Recent Publications

- 1. Lacivita et al. (2018) Steam-ultrasound combined treatment: A promising technology to significantly control mozzarella cheese quality. LWT 93:450-455.
- 2. Musavian et al. (2015) Combined steam-ultrasound treatment of 2 seconds achieves significant high aerobic count and Enterobacteriaceae reduction on naturally contaminated food boxes, crates, conveyor belts, and meat knives. Journal of Food Protection doi: 10.4315/0362-028X.JFP-14-155.
- 3. Musavian et al. (2014) Combined steam and ultrasound treatment of broilers at slaughter: a promising intervention to significantly reduce numbers of naturally occurring campylobacters on carcasses. International Journal of Food Microbiology 176:23-8.
- 4. Hansen and Larsen, (2007). Reduction of *Campylobacter* on chicken carcasses by SonoSteam[®] treatment. Proceeding of European Congress of Chemical Engineering (ECCE-6), Copenhagen, 16-20 September 2007.

Biography

Hanieh S Musavian has completed her Master's degree in Biotechnology from Technical University of Denmark. Currently she is working as an R&D Project Manager and Specialist at FORCE Technology (an GTS Institute) which is an independent not-for-profit organisation located in Denmark.

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