

Listeria reduction on fish box

SonoSteam® treatment achieves 100% *Listeria* reductions within 1 second

Obtained results

SonoSteam® is a chemical free treatment which uses a combination of steam and ultrasound to treat surfaces of food and non food products. Successful 100% *Listeria* reduction is achieved by only 1 second. Surface temperature return quickly back to starting temperature. Coagulated proteins were easily be rinsed of the surface.



N=6	Average level before treatment Log10 CFU/20cm ²	Average level after treatment Log10 CFU/20cm ²	Reduction %
<i>Listeria</i>	4.82*	0	100

*SonoSteam® treatment of natural contaminated food box; 4.82 log CFU/24cm² is equal to 66069 bacteria cells per 24 cm² box area

About the experiment

In this case study, a continuous treatment of combined steam-ultrasound, produced from special designed nozzles, was investigated on a naturally contaminated fish box. This pre-contaminated fish box was received from a Danish fish processing plant. The fish box (shown above) was visibly contaminated with fish soil and fish residues. The bottom of the box was cut into smaller parts in order to have replicates for the SonoSteam treatment. All parts were briefly sprayed with a solution of *Listeria* culture. Three parts were analyzed without the treatment (controls) while three

other parts were SonoSteam treated for 1 second. All parts were analyzed for *Listeria* contamination. The results are presented in the table below. Initial *Listeria* levels were 4.8 log on average. SonoSteam treatment achieved total reductions. Heat and pressure from the treatment resulted in coagulated proteins and biofilm shown on the surface of the fish box. These were easily detached and were not burned onto the surface. A short rinse removed all residues very easily (see picture below).

The SonoSteam® process

SonoSteam® is a chemical free decontamination process designed for food and non-food surfaces. The technology applies the combination of steam and ultrasound to achieve rapid and enhanced treatment within seconds. The short treatment (within 2 seconds) is ideal for decontamination of delicate food products such as chicken or salmon, without causing adverse changes to food quality. The treatment is also designed for effective and continuous disinfection of materials and food contact surfaces during production.



Benefits of using SonoSteam®

1. Significant reduction of microorganisms

Effective reduction of surface related microorganisms like pathogens i.e. *Campylobacter*, *Salmonella*, *E.coli*, *Listeria* and other bacteria. In addition, SonoSteam® is effective against yeast and fungi.

2. Only few seconds of treatment

The combination of ultrasound with steam results in a heat transfer so fast that microorganisms are reduced within seconds. Thereby it is possible to integrate SonoSteam in any production without causing delays.

3. No use of chemicals

SonoSteam® only features steam and ultrasound. The process does not use any chemicals or other agents that otherwise might leave residues. Therefore the technology can be applied to organic surfaces during production.

4. None or minimal sensory impact

SonoSteam® does not cause any significant changes to sensory characteristics, such as appearance or odour.

5. Reaches the microstructure of the surface

Microorganisms placed in the microstructure and pits of the product surface are reached and reduced by the steam. The ultrasound causes the steam to be continuously forced into pits and pores on the surface.

Contact information

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