

IMPROVING MICROBIAL SAFETY OF POULTRY PRODUCTS BY COMBINED STEAM AND LACTIC ACID DECONTAMINATION TREATMENTS

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OBJECTIVES

The effectiveness of combined process using water steam (10 seconds, 70°C and 98°C) and lactic acid concentrated solutions (1 minutes, 5% and 10% lactic acid), on the inactivation of *Listeria innocua* inoculated on the surface of chicken skins have been studied in order to determine operating conditions allowing an efficient decontamination of the poultry skin without changing its organoleptic properties.

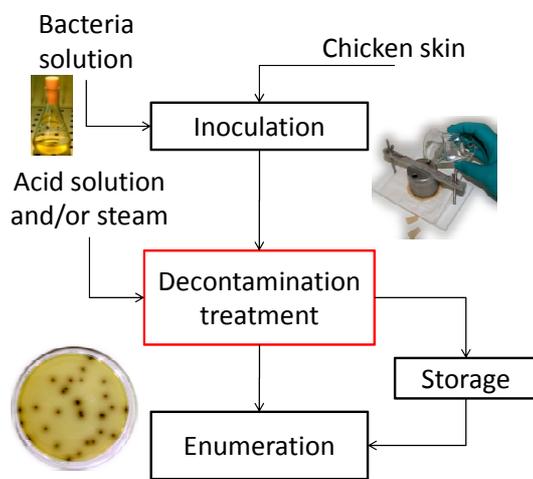


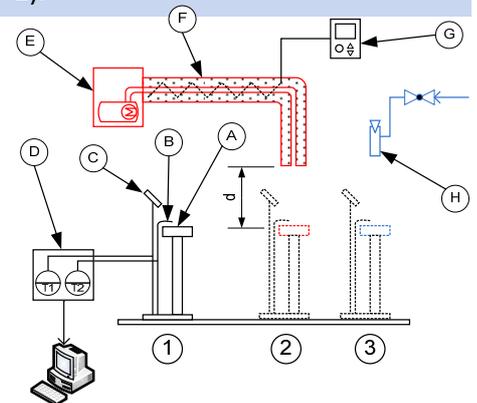
Fig 2. Experimental approach

METHODS

Chicken skins were surface inoculated with *Listeria innocua* and treated with steam (Fig. 1) and/or lactic acid solutions. Surviving bacteria on the skin were enumerated immediately after treatment, and after 7 days of storage (Fig. 2).

Fig 1. Steam treatment rig.

- A) Sample holder
- B) Thermocouple
- C) Infra-red pyrometer
- D) Data acquiring system
- E) Steam generator
- F) Pipe with heating resistances
- G) resistances regulation
- H) Cooling system
- 1) Sample holder positioning
- 2) Steam treatment
- 3) Cooling



RESULTS

The immediate effect of the strongest combined treatment (98°C steam and 10% lactic acid) can be attributed to the heat treatment part. However, after 7 days of storage, the decontaminating effect is mainly due to the acid treatment part, which prevents growth of the bacteria that survived the heat treatment. Reductions after storage reached 5.71 log for the strongest combined treatment. Gentler treatments (70°C steam, 5% lactic acid) revealed a genuine synergy between heat and acid treatments, paving the way for an effective means of reducing bacterial load on the surface of poultry without affecting the product's "raw" appearance. Reductions reached 4.30 log after storage. Residual lactic acid measurements and panel testing showed no difference between untreated controls and treated samples up to the 10% lactic acid and 1 minute treatment.

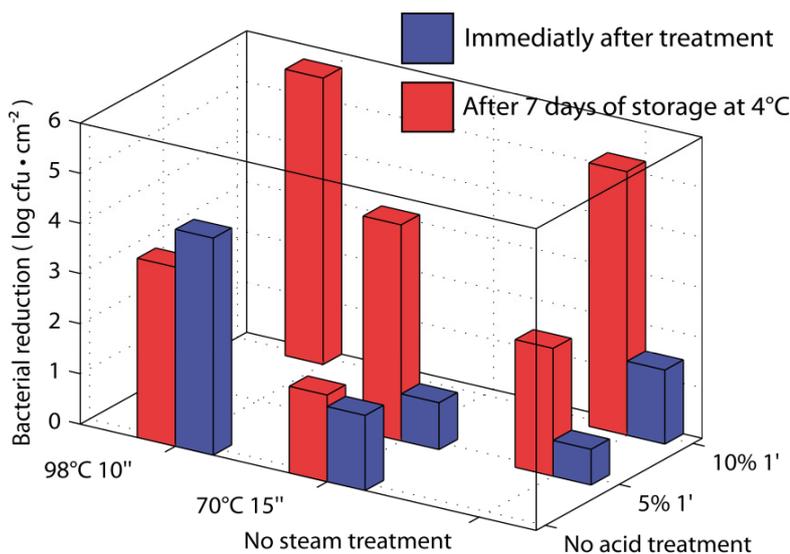


Fig 3. Decontaminating effect of water steam and lactic acid treatments.