

Effect of different treatments on swine carcasses surface contamination with *Salmonella Typhimurium*

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Abstract

Salmonella is worldwide related to the most cases of food poisoning in humans. The meat contamination may occur from direct or indirect sources during the slaughter and pork processing. The main factors that contribute to pig carcass contamination at the slaughterhouse are the presence of asymptomatic Salmonella shedders and Salmonella transmission during the pre-slaughter transport and lairage. Usual slaughter procedures may be not able to totally avoid the contamination of the surface of carcasses. Therefore, the aim of this study was to test different treatments to reduce Salmonella contamination, which may be adopted for decontamination of pig carcasses. Skin samples from pigs were artificially contaminated with a Salmonella Typhimurium phage type DT144 suspension (10⁶ CFU/mL), and afterwards underwent nine treatments: 1) water, 2) water at 80°C, 3) water at 80°C with an organic acids blend (ascorbic, citric and lactic, Citrex®), 4) chlorinated water at 80°C with acids, 5) chlorinated water at 80°C, 6) water with acids, 7) chlorinated water with acids, 8) chlorinated water and 9) negative control (no treatment). Concentrations of 1,000 ppm and 2 ppm of Citrex® and chlorine, respectively, were used. All treatments were performed in ten repetitions and applied under controlled pressure (3 atm) for 10 seconds. Each skin was sampled, by swabbing a 5cm²-area on three occasions: before, shortly after and 24 hours after treatment. Swabs were placed individually in Buffered Peptone Water, homogenized, and 100 µL were spread on XLD agar for colony-formation unit counting of Salmonella. Data were analyzed using repeated measures model by the MIXED procedure of SAS. The effects of block, treatment, time and the interaction between them were tested. The treatment with chlorinated water at 80°C with organic acids had the best performance immediately after treatment and 24 hours later, followed by the treatments with chlorinated water plus organic acid, and water with organic acid.