

**TITLE:** BIOFILM FORMATION AND RESISTANCE TO SANITIZERS OF *Salmonella* ISOLATED FROM THE PEANUT SUPPLY CHAIN

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**ABSTRACT:**

Pathogens such as *Salmonella* can be difficult to control in low-moisture food (LMF) processing plants and because of this its presence especially in biofilm should be prevented. This study evaluated the capacity of *Salmonella* strains isolated from the peanut supply chain (*S. Muenster*, *S. Miami*, *S. Glostrup*, *S. Javiana*, *S. Oranienburg* and *S. Yoruba*) to form biofilm as well as their resistance to sanitizers (sodium hypochlorite, peracetic acid, quaternary ammonium, alkaline chlorinated solution and biguanide). Regarding biofilm formation, there was no significant difference ( $p > 0.05$ ) among the strains tested singly on AISI 304 stainless steel (SS) and polypropylene (PP) coupons at the same temperature. However, a difference ( $p < 0.05$ ) between the temperatures was noted in the first hours of incubation. The sessile cells reached counts between 3 and 4 log CFU/cm<sup>2</sup> at 25 °C whereas more than 5 log CFU/cm<sup>2</sup> was observed at 37 °C after 8 h. From 24 h the counts were above 6 log CFU/cm<sup>2</sup> for both temperatures. Nevertheless, the SEM images of the 6-strain *pool* showed the greatest density of adhered cells after 48 h at 25 °C and 24 h at 37 °C on PP, and after 48 h at both temperatures on SS. Peracetic acid had the best results on 24-h biofilm on SS and PP, with sessile cell counts below the limit of detection (0.59 log CFU/cm<sup>2</sup>) after 3 min. For 48-h and 96-h biofilm, sodium hypochlorite decreased more than 4 log CFU/cm<sup>2</sup> within 5 min. Quaternary ammonium and chlorinated alkaline detergent showed intermediate performances. Only biguanide did not reduce the biofilm counts to below the limit of detection in any of the conditions evaluated. The results indicated high biofilm formation ability of the *Salmonella* strains isolated from the peanut supply chain. Nevertheless, in general the biofilms were sensitive to most sanitizers within 15 min of treatment.

**Keywords:** Food safety, Low moisture food, Chlorine, Food microbiology, Sanitation.

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