

Biofilm formation in *Salmonella enterica* subsp. *enterica* serovar Derby isolated over a ten-year period in southern Brazil

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Salmonella enterica subsp. *enterica* (S.) serovar Derby is one of the most frequently detected serovars in the swine production chain of southern Brazil. Previous studies indicated that isolates of S. Derby belonging to common PFGE-pulsotypes and displaying similar antimicrobial resistance profiles may have been circulating over the years in this region. Survival of *Salmonella* in the environment and persistence in the host are facilitated by the ability to form biofilms. Thus, the aim of this study was to evaluate the biofilm formation ability among 136 S. Derby isolates collected over a ten-year period from various porcine origins (lymph nodes, intestinal content, environment and pork). For this purpose, S. Derby isolates were tested by three different methods: *i.* colony morphology on Congo Red agar to determine the phenotypic expression of curli fimbriae and cellulose; *ii.* evaluation of biofilm formation in liquid-air interface of Luria Bertani (LB) broth; *iii.* adherence on a 96-well polystyrene microtitre plate. When incubated at 28°C for 48 hours, three different colony morphology types were observed. The Rdar type (read, dry and rough colonies) was the most frequent, being detected in 60 isolates (44.1%); while Saw (smooth) and Pdar (pink, dry and rough) types were observed in 40 (29.4%) and 36 isolates (26.5%), respectively. The Rdar and Pdar types, which together encompassed the majority of the isolates, are considered the most often observed in *Salmonella* isolates able to form biofilm. At 37°C, 14 isolates (10.3%) were able to adhere weakly on the polystyrene surface, whereas at 28°C a larger number (n=102; 75%) of isolates showed to be weak or moderate biofilm producers. These results demonstrate that the expression of biofilm and adherence to polystyrene plates may be affected by environmental factors such as temperature. Almost all of the adherent isolates at 28°C showed Rdar (58.8%) or Pdar (34.4%) morphotypes, demonstrating a good agreement between both tests. Fifty four isolates (39.7%) were able to form a rigid pellicle in the liquid-air interface of LB broth. These isolates displayed Rdar or Pdar colony type, were also biofilm producers on polystyrene surface, and were originated from samples collected over the ten-year period. In conclusion, a large number of S. Derby isolates from porcine sources showed to be able to form biofilm. This ability, in turn, may be a factor that contributes to their persistence in the pig production environment.

Key words: adherence, environment persistence, pig production.

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