

Biofilm formation by *Salmonella* spp. in catfish mucus extract under industrial conditions

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Highlights

- *Salmonella* uses catfish mucus as a nutrient source for growth and biofilm formation on different food-contact surfaces.
- *Salmonella* serotype Blockley biofilm formation in catfish mucus extract was least on buna-N rubber.
- No differences in biofilm formation were observed among six *Salmonella* strains in catfish mucus extract.
- Growth and biofilm formation of *Salmonella* spp. increased with increasing concentration of catfish mucus at 22°C and 10°C.

Abstract

The objective of this study was to determine the effect of strain and temperature on the growth and biofilm formation of *Salmonella* spp. in high and low concentrations of catfish mucus extract on different food-contact surfaces at 22 °C and 10 °C. The second objective of this study was to evaluate the efficacy of disinfectants at recommended concentrations and contact times for removing *Salmonella* biofilms cells on a stainless steel surface containing catfish mucus extract. Growth and biofilm formation of all *Salmonella* strains increased with higher concentrations of catfish mucus extract at both 10 °C and 22 °C. In 15 µg/ml of catfish mucus extract inoculated with 3 log CFU/ml, the biofilm levels of *Salmonella* on stainless steel surface reached to 3.5 log CFU/cm² at 10 °C or 5.5 log CFU/cm² at 22 °C in 7 days. In 375 µg/ml of catfish mucus extract inoculated with 3 log CFU/ml, the biofilm levels of *Salmonella* on the stainless steel surface reached 4.5 log CFU/cm² at 10 °C and 6.5 log CFU/cm² at 22 °C in 7 days. No differences were observed between *Salmonella* strains tested for biofilm formation in catfish mucus extract on the stainless steel surface. The biofilm formation by *Salmonella* Blockley (7175) in catfish mucus extract was less ($P < 0.05$) on

buna-N rubber when compared to stainless steel, polyethylene and polyurethane surfaces. *Salmonella* biofilm cells were not detectable on the stainless steel surface after treatment with a mixture of disinfectants but were still present when single compound disinfectants were used.

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Keywords

Salmonella; Growth; Biofilm; Catfish mucus; Disinfectants

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