

Impact of Food Soils on Biofilm Formation by *Listeria monocytogenes* and *Salmonella* on Stainless-Steel Surfaces



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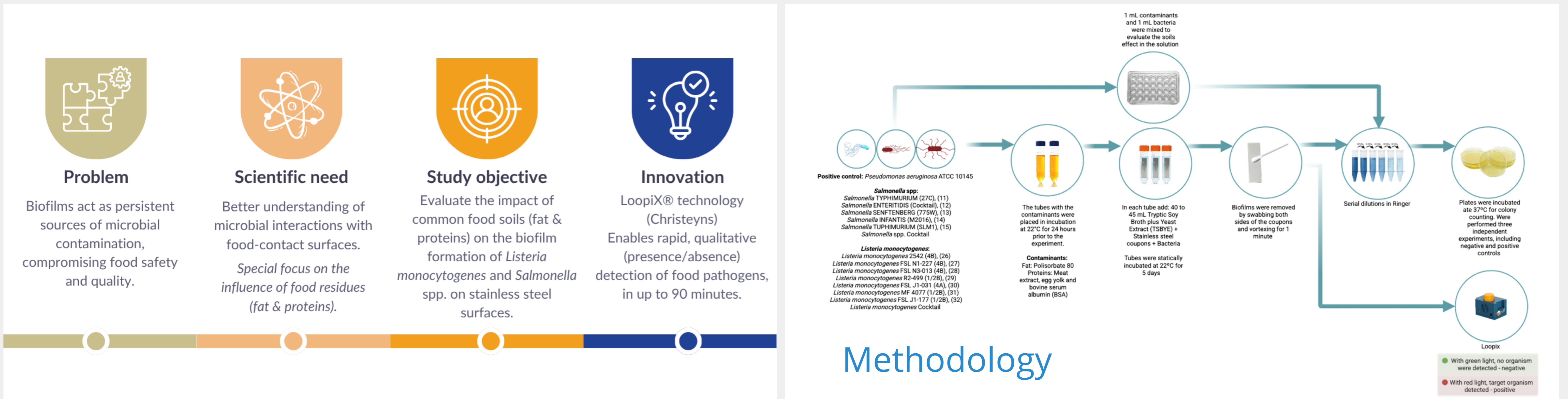
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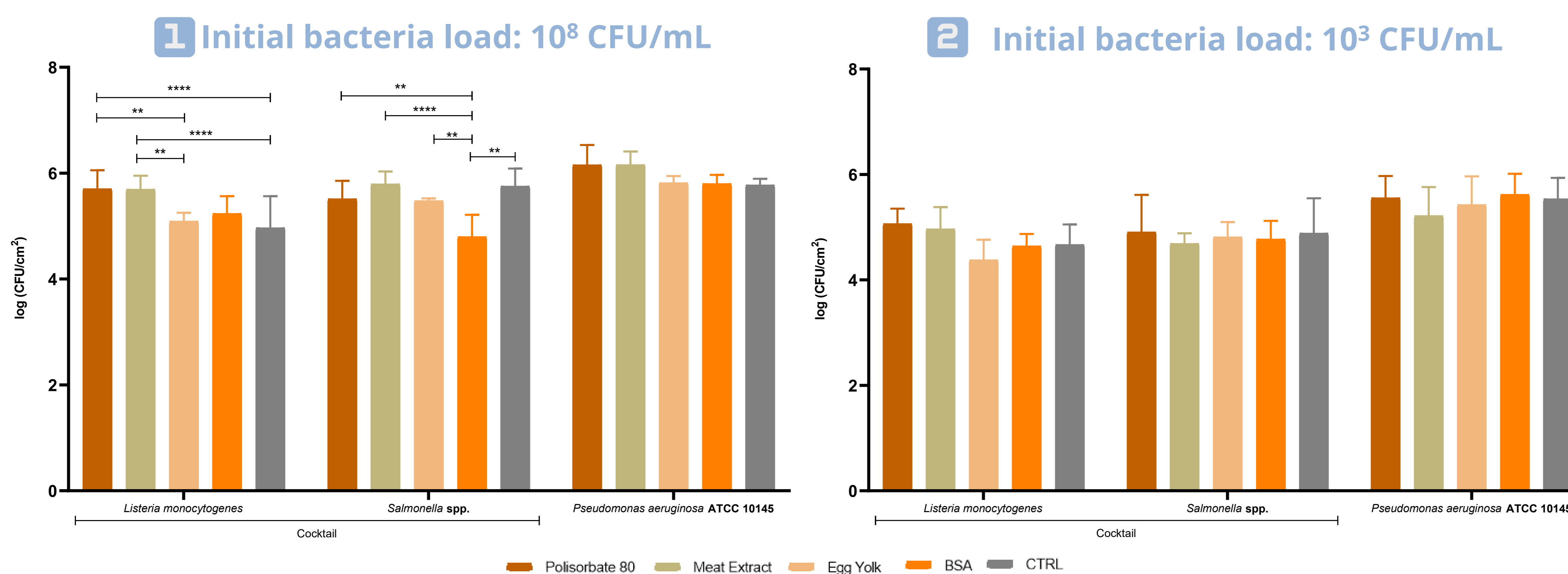
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PORTO

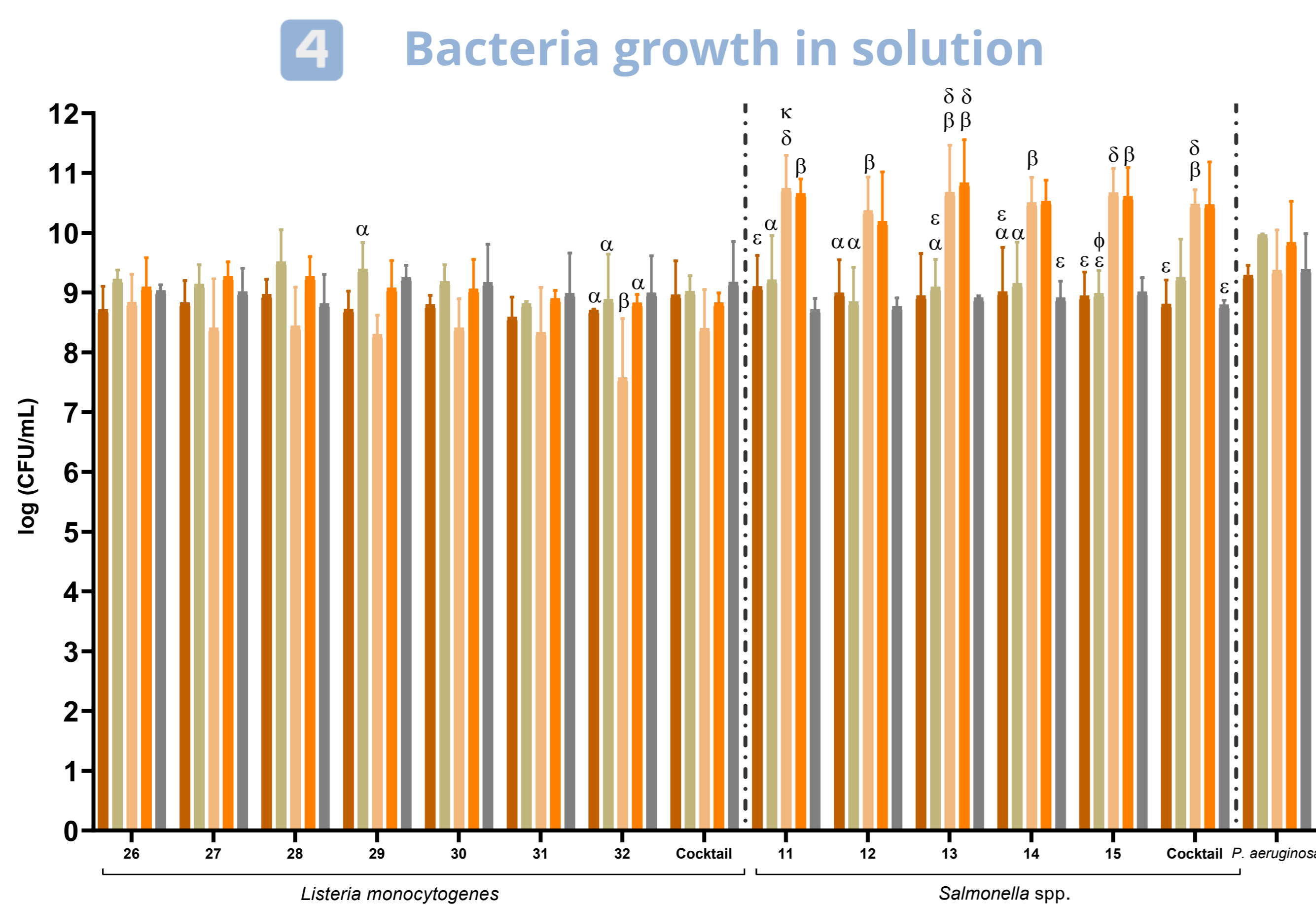


Results and Discussion

Effect of soils in Stainless-Steel Surfaces



Effect of soils in solution



Biofilm formation
occurred regardless of initial bacterial load (high or low) or food soil presence.

The presence of fat and proteins
did not inhibit the biofilm formation. In solution, egg yolk and BSA promote the biofilm formation in *Salmonella* spp.

Loopix®
can rapidly detect pathogen presence in biofilms (qualitative), but cannot measure contamination level (quantitative).

Effective cleaning protocols & preventive measures are essential.

BSA: Bovine Serum Albumin | CTRL: Control | Statistical analysis was performed using GraphPad Prism Software (GraphPad Software Inc., version 8.0.2), using a one-way ANOVA or two-way ANOVA, followed by Tukey's multiple comparisons test. *p*-value < 0.05 was considered statistically significant. For the same strain, significant differences for biofilm formation: α - Egg yolk (p<0.05) | φ - Egg yolk (p<0.01) | β - CTRL (p<0.01) | κ - CTRL (p<0.001) | δ - Polisorbate 80 (p<0.01) | ε - BSA (p<0.05)

Conclusions

- ✓ *Listeria monocytogenes*, *Salmonella* spp. and *P. aeruginosa* biofilms can grow even if the initial microbial load is low (10³ CFU/mL) or high (10⁸ CFU/mL).
- ✓ The biofilm formation occurred in the presence of fat and proteins.
- ✓ Loopix® offers a promising tool for rapid, easy, and local detection of pathogens, although its current qualitative nature limits its use for quantifying contamination levels. The formation of biofilm, regardless of the presence of food soils, highlights the importance of cleaning protocols and preventive measures, such as regular surface disinfection, monitoring contamination points, and the use of antimicrobial agents.

Acknowledgements

Funded by the European Union. Views and opinions expressed are however those of the author(s) only and do not necessarily reflect those of the European Union or European Research Executive Agency (REA). Neither the European Union nor the granting authority can be held responsible for them—project number 101036754 (CATALYSE project). We would also like to thank the scientific collaboration under the FCT project UID/50016/2025 and the financial support for author M. Carvalho provided by a doctoral 2021.06413.BD fellowship (FCT).

