

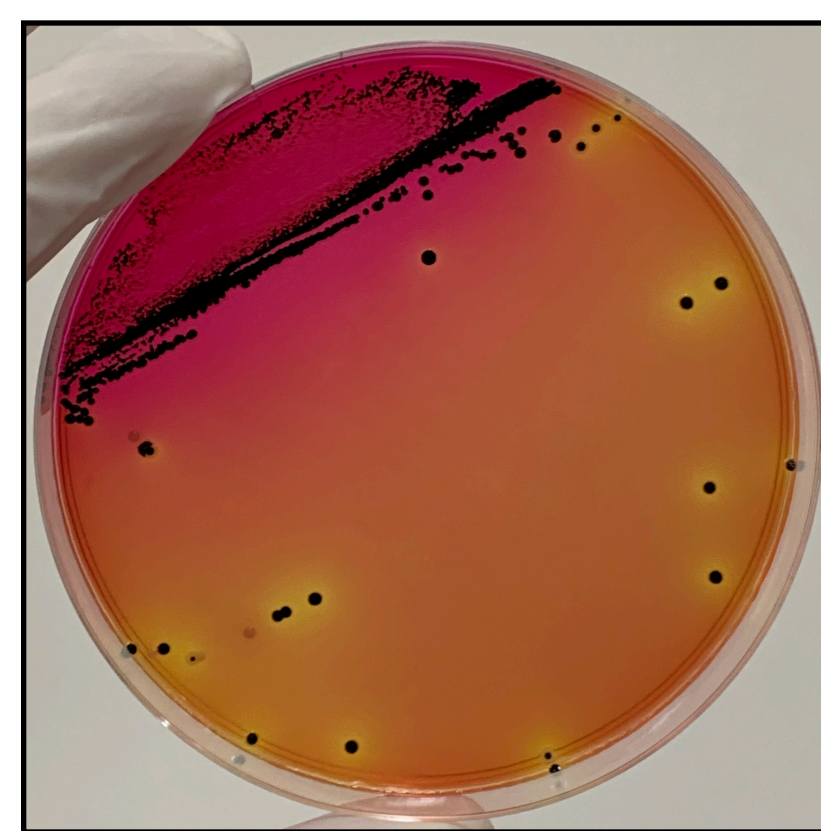
Prevalence of *Salmonella* spp. Isolated from Environmental Food Surfaces from Vegetable Markets in Cambodia

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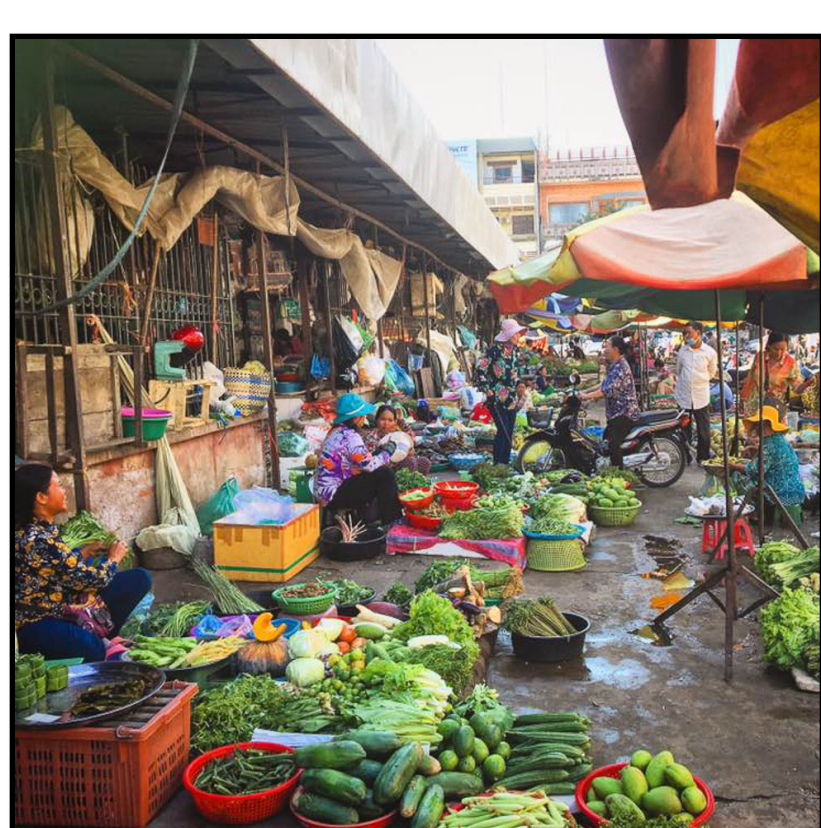
Introduction



- Foodborne illness cause one in ten people to fall ill every year. *Salmonella* spp. is among the top five global causes of diarrheal diseases.
- Informal vegetable markets are an important part of the culture and economy in Cambodia. However, their lack of hygiene and sanitation practices, food safety regulations, and infrastructure present risks of contamination to the vegetables and those who consume them.

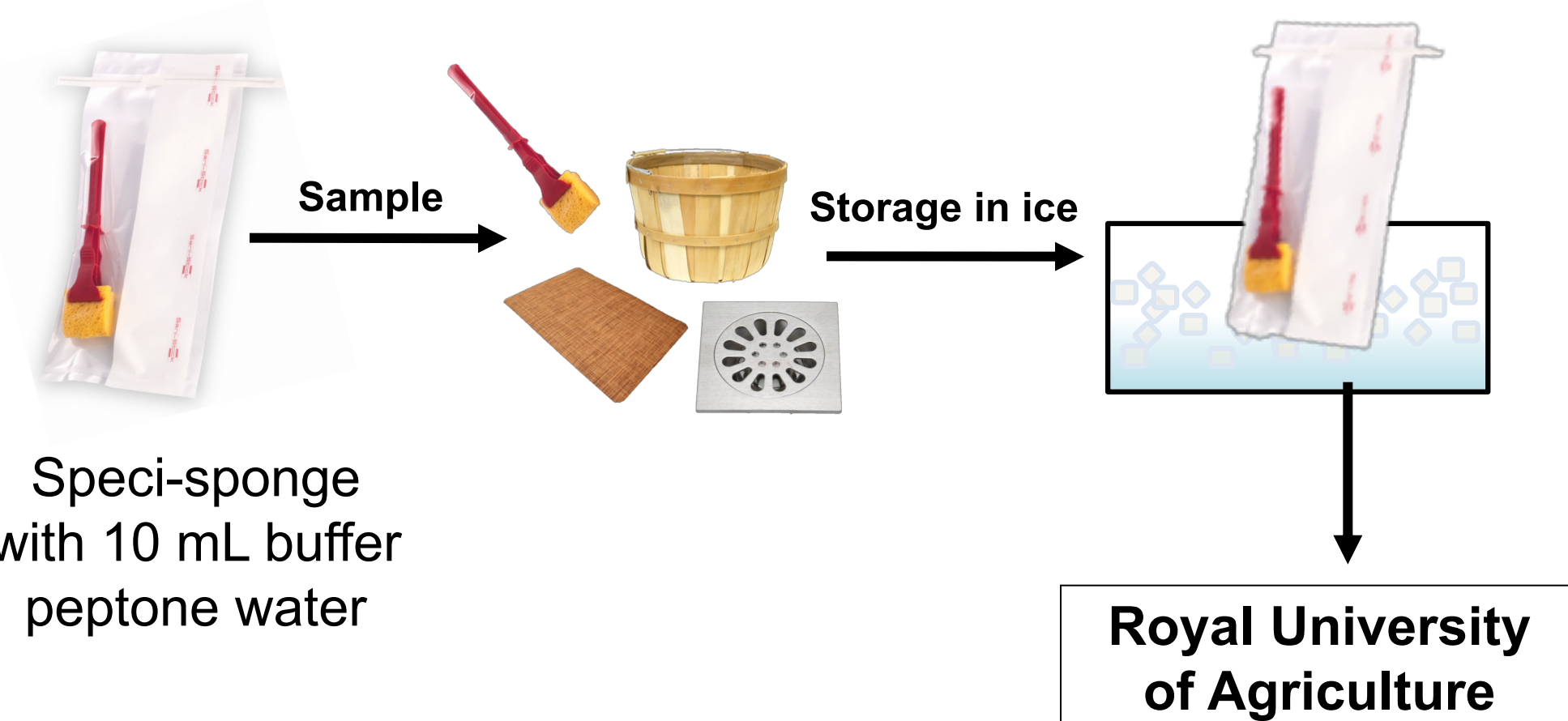
Objective

Determine the prevalence of *Salmonella* spp. in informal vegetable markets in Cambodia. The effect of location within the market (inside and outside) and surface types (food contact surface, FCS and non-food contact surface, NFCS) was evaluated.

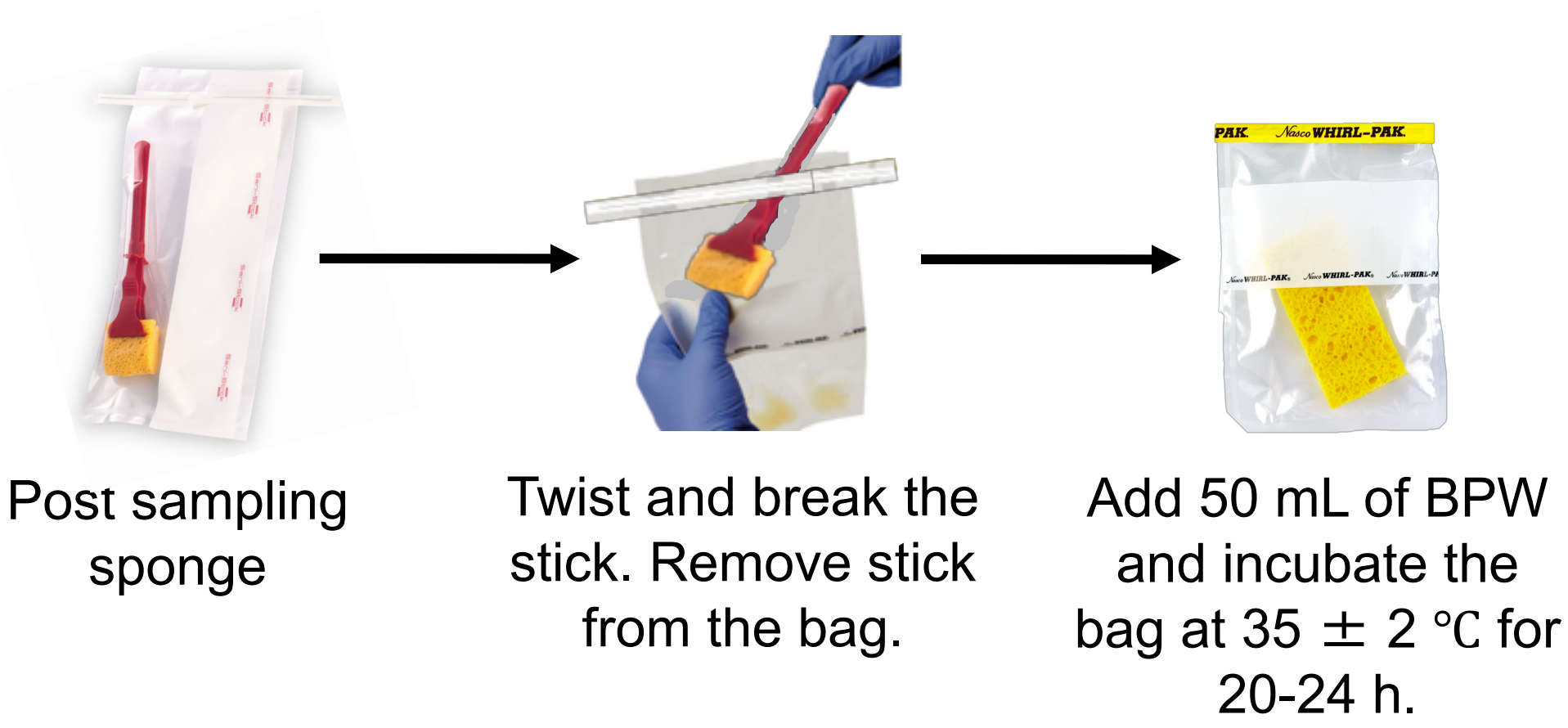


Material and Methods

1. Sample Collection

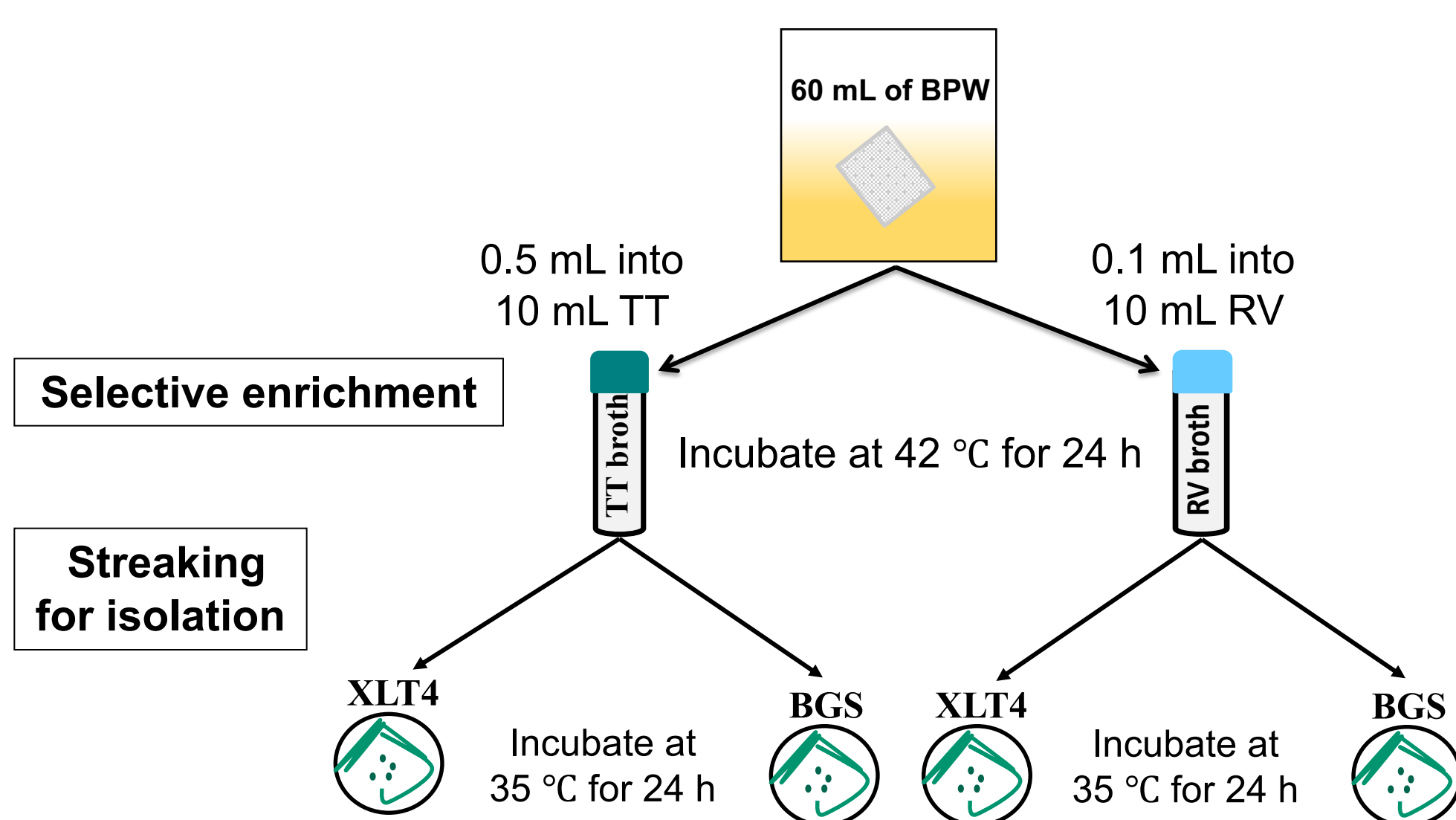


2. Sample Preparation and Enrichment

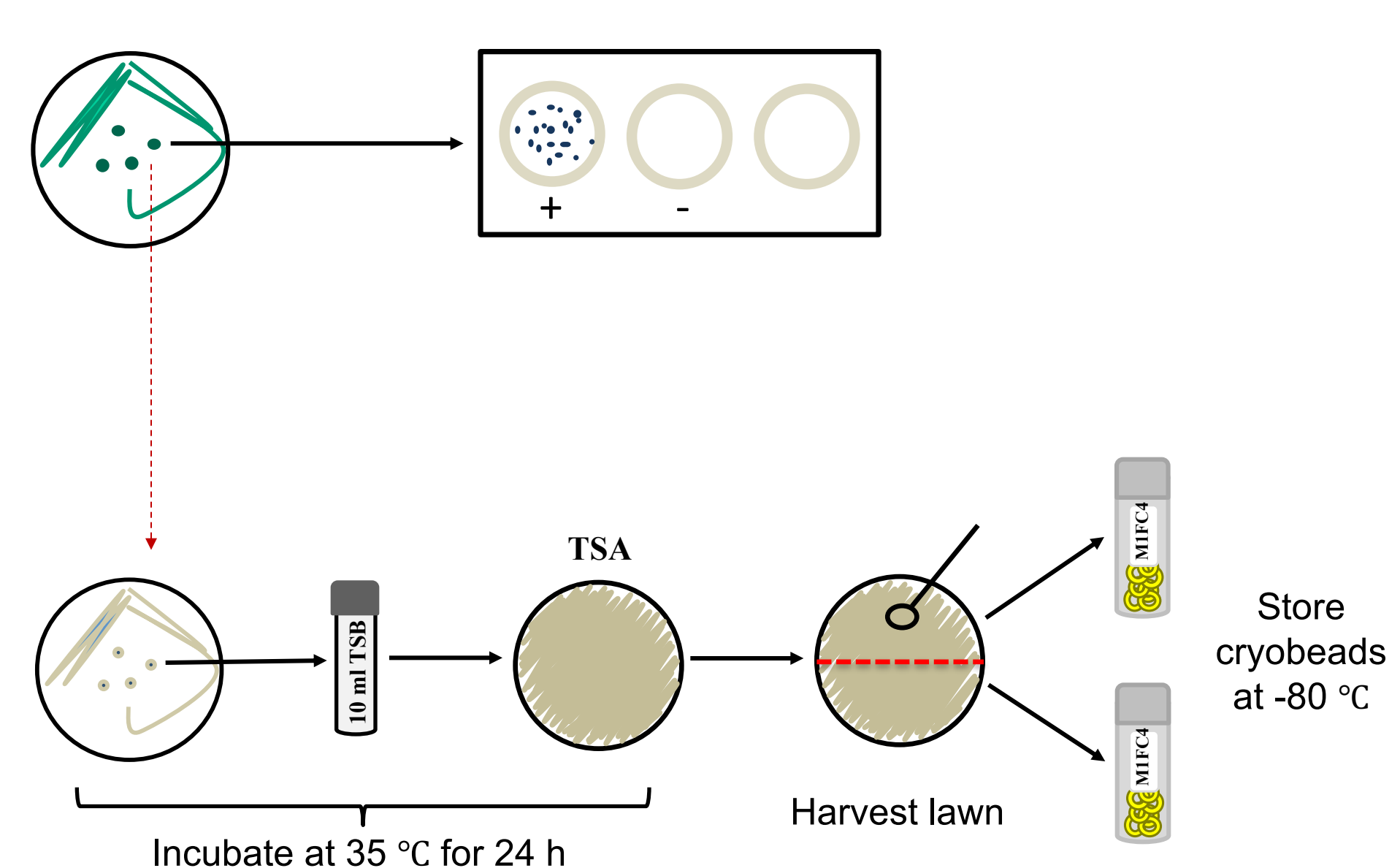


- Samples were collected according to the Food Safety and Inspection Service (FSIS) Directive 10,300.1, Rev. 1, Section VII, A, 12 and analyzed for *Salmonella* spp. by using FSIS Microbiology Laboratory Guidebook 4.09 methods.

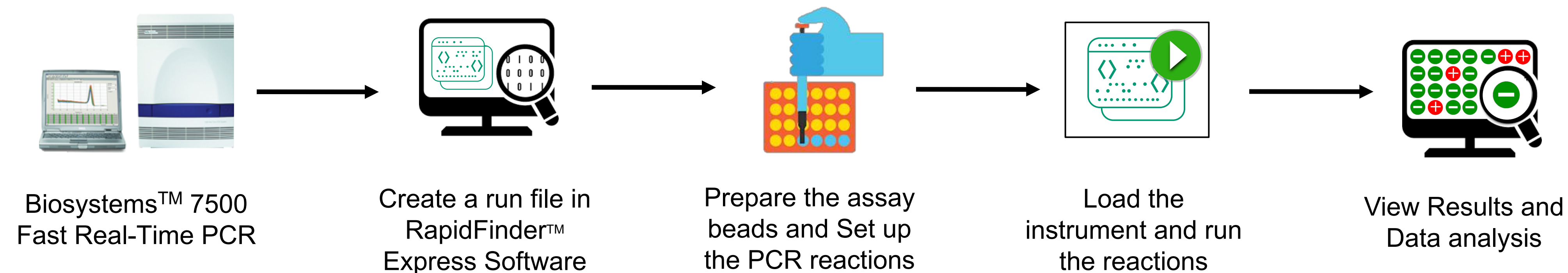
3. *Salmonella* spp. Screening



4. Agglutination and Culture Storage



5. PCR Confirmation



- PCR was performed on a Applied Biosystems™ 7500 Fast Real-Time PCR Instrument using the MicroSEQ™ *Salmonella* spp. Detection Kit.

Statistical Analysis

Data was collected in a nested design and analyzed using a generalized linear mixed-model ANOVA. Significant effect means were compared at $\alpha = 0.05$. Relative risk was calculated.

Results and Discussion

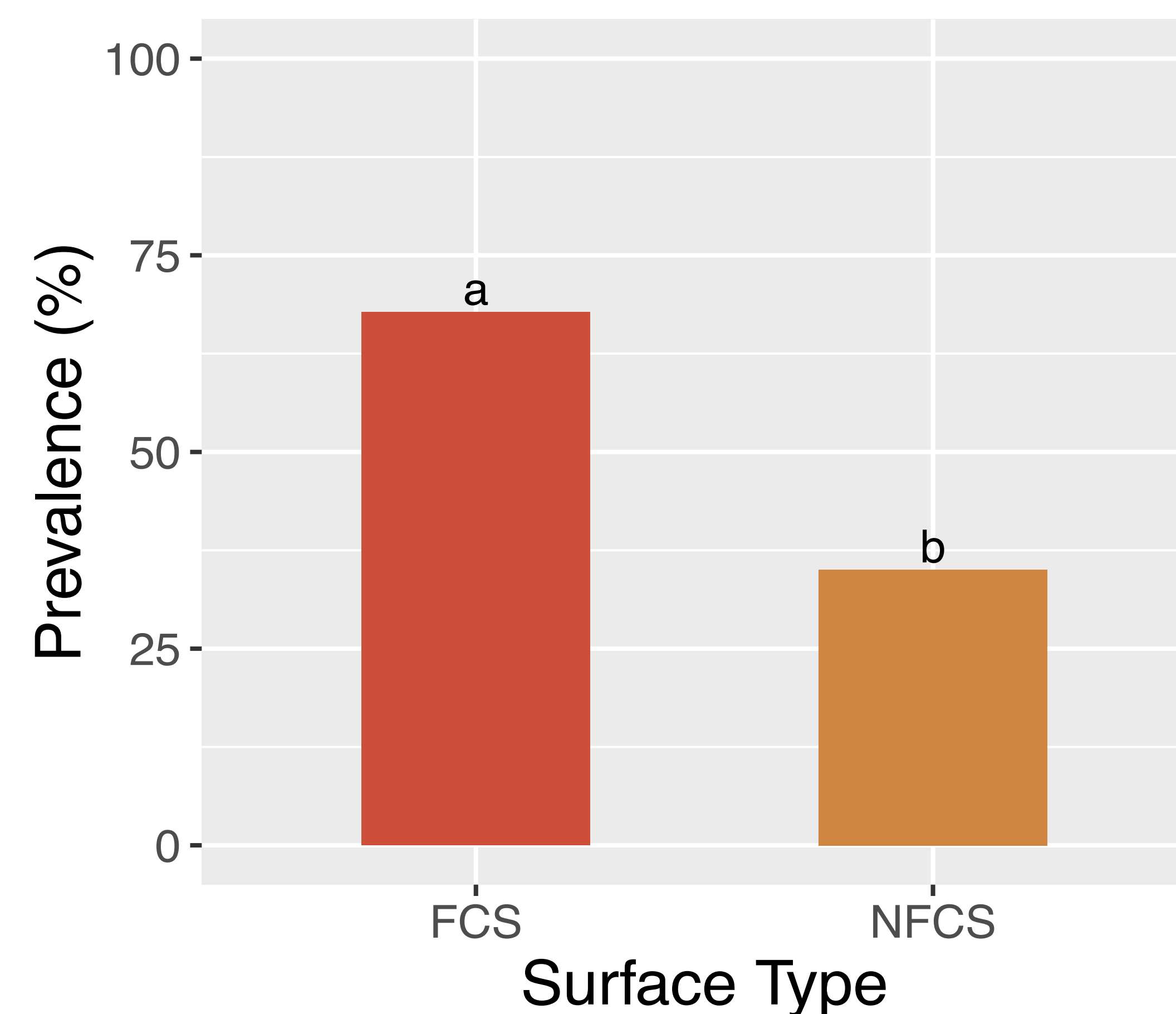


Figure 1 – Prevalence of *Salmonella* spp. by surface type. Means followed by the same letter are not significantly different ($P \leq 0.05$). Surface Type (FCS = food contact surface, NFCS = non-food contact surface).

Table 1 – ANOVA table of prevalence

Source	P-value
Location	0.919
Surface	0.013
Location*Surface	0.867

- Overall *Salmonella* spp. prevalence was 50%.
- A significant effect of surface type was observed with a prevalence of 66% and 36% for FCS and NFCS, respectively.

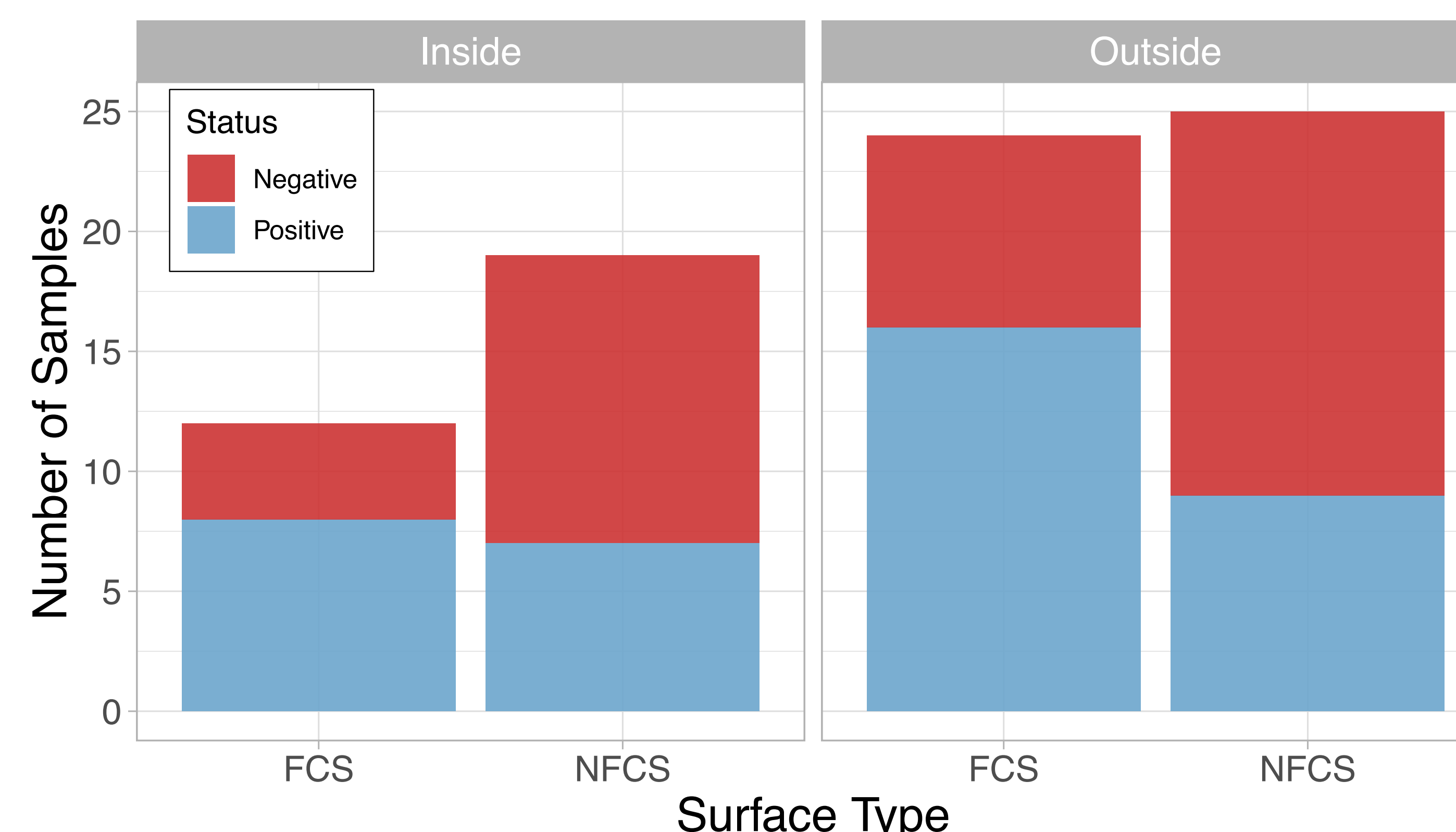


Figure 2 – Distribution of samples within location and surface type. Surface Type (FCS = food contact surface, NFCS = non-food contact surface). Location = Inside and Outside.

- Vegetables sold inside the market were 15% more likely to be exposed to *Salmonella* spp. when compared to vegetables sold outside of the market.
- Vegetables exposed to FCS were 27% more likely to be exposed to *Salmonella* spp. when compared to NFCS.

Conclusion

- To the best of our knowledge, this is the first study to investigate the prevalence of *Salmonella* spp. in environmental samples from informal vegetable markets in Cambodia.
- The availability of accurate data on the prevalence of *Salmonella* spp. in these markets is crucial for effective surveillance, implementation of suitable intervention strategies and prevention of future foodborne illness cases in Cambodia.

References

- Food Safety and Inspection Service. FSIS Directive 10,300.1, Rev. 1, Section VII, A, 12. 2013.
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- World Health Organization. (2015). WHO estimates of the global burden of foodborne diseases: foodborne disease burden epidemiology reference group 2007-2015.
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Acknowledgements

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