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

Carla Schwan¹, Karina Desiree¹, Kanwal Ayub², Randall Phuebus¹, Sara Gragg¹, Justin Kastner³, Jessie Vipham¹

¹Department of Animal Sciences and Industry, College of Agriculture; ²Department of Statistics, College of Arts and Sciences; ³Department of Diagnostic Medicine/Pathobiology, College of Veterinary Medicine

### 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**
   - Spécimen sponge with 10 mL buffer peptone water
   - Collection by Carla Schwan.

2. **Sample Preparation and Enrichment**
   - Add 50 mL of BPW and incubate the bag at 35 ± 2 °C for 24 h.
   - Incubate at 42 °C for 24 h.
   - Incubate at 35 °C for 24 h.
   - Selective enrichment: 0.1 mL into 10 mL TT
   - Selective enrichment: 0.5 mL into 10 mL RV

3. **Salmonella spp. Screening**
   - Add 10 mL of BPW
   - Incubate at 35 °C for 24 h.

4. **Agglutination and Culture Storage**
   - Store cryobeads at -80 °C
   - Incubate at 35 °C for 24 h.
   - Harvest lawn

5. **PCR Confirmation**
   - Create a run file in RapidFinder™ Express Software
   - Prepare the assay beads and Set up the PCR reactions
   - Load the instrument and run the reactions
   - View Results and Data analysis

### Results and Discussion

![Table 1 – ANOVA table of prevalence](image)

<table>
<thead>
<tr>
<th>Source</th>
<th>P-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Location</td>
<td>0.919</td>
</tr>
<tr>
<td>Surface</td>
<td>0.130</td>
</tr>
<tr>
<td>Location*Surface</td>
<td>0.867</td>
</tr>
</tbody>
</table>

- 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 1 – Prevalence of *Salmonella* spp. by surface type.**

**Figure 2 – Distribution of samples within location and surface type.**

### 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


### Acknowledgements

This poster is made possible by the generous support of the American people through the United States Agency for International Development. The contents are the responsibility of the Horticulture Innovation Lab and do not necessarily reflect the views of USAID or the United States Government.