Prevalence of *Salmonella* and *Staphylococcus aureus* From Meat in Cambodian Markets

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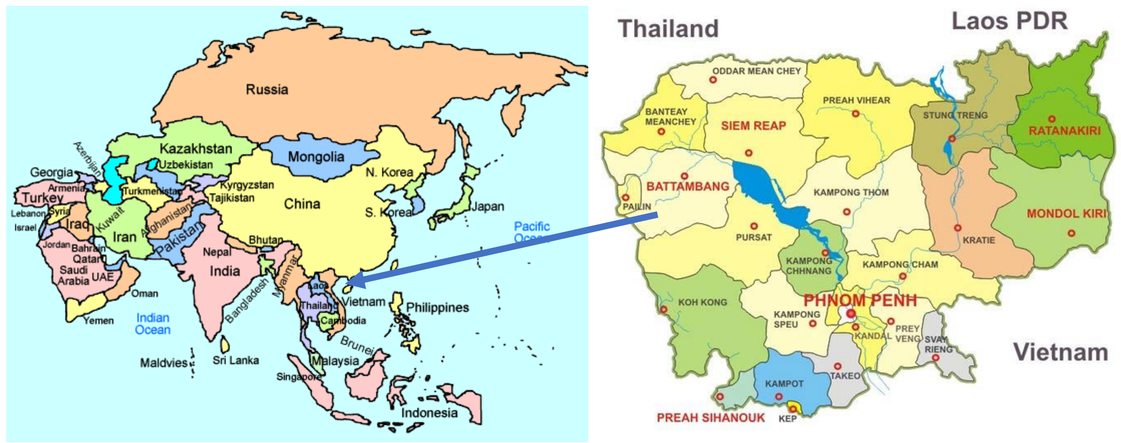
Introduction

Fresh meat can be contaminated with microorganisms during harvest, slaughter or processing and handling (Xuan *et al.,* 2019). This study focuses on the market survey to analyse key pathogens in meat sold in wet markets and the associated risk factors of *Salmonella* and *S. aureus*.



Materials and methods

Sampling was conducted probabilistically from retail markets for pork and chicken meat in 11 provinces of Cambodia between Nov 2018 and Jan 2019 and will be done in the remaining 14 provinces. The sample types were pork (n=72), chicken meat (n=72) and swabs from cutting board (n=48), and subject for isolation of *Salmonella* (ISO 6579-1_2002) and *Staphylococcus aureus* (ISO 6888-1- 1999).

Fig 1: Traditional market in Kampong Cham, chicken and pork meat seller participated in interview and sampling meat and cutting board.

Fig 2: Bacterial isolation-25g meat + 225 mL of PBW was mixed by stomacher for *Salmonella* and *S. aureus* isolation. For *Salmonella* species identification, the suspension of a selective-enrichment was MKTT and RV were sub-culture on XLD. One to two typical *Salmonella* colonies per plate will be used to biochemically confirm *Salmonella* using Lactose, Indol, Lysine and H2S, Urea, ONPG, and MR-VP. For *S. aureus* identification, the incubated PBW was streaked on Baird Parker agar, overnight and colonies were sub-culture on TSA and confirm by coagulase test and future API Staph for species specific.

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Results

Table 1: Preliminary result of contamination in all sample including pork, chicken and cutting board swab, in 11 provinces and municipal.

Province	N# of Sample	N# Positive Sample (%)	
		Salmonella	*S. aureus*
Phnom Penh	24	3 (12.5)	2 (8.3)
Siem Reap	24	18 (75.5)	8 (33.3)
Takeo	16	6 (37.5)	6 (37.5)
Kampong Cham	16	6 (37.5)	10 (62.5)
Tbong Khmom	16	8 (50.0)	6 (37.5)
Kep	16	10 (62.5)	4 (25.0)
Kampot	16	10 (62.5)	5 (31.3)
Kampong Speu	16	6 (37.5)	10 (62.5)
Kandal	16	6 (37.5)	3 (18.8)
Kampong Chhnang	16	9 (56.3)	7 (43.8)
Oddor Meanchey	16	7 (43.8)	0 (0)
Total	192	89 (46.4)	61 (31.8)

To date, of the 192 samples were collected including chicken sample, pork and cutting board swabs and in total of 89 isolates (46.4%) of *Salmonella* and 61 isolates of *S. aureus* (31.8%) has been detected.

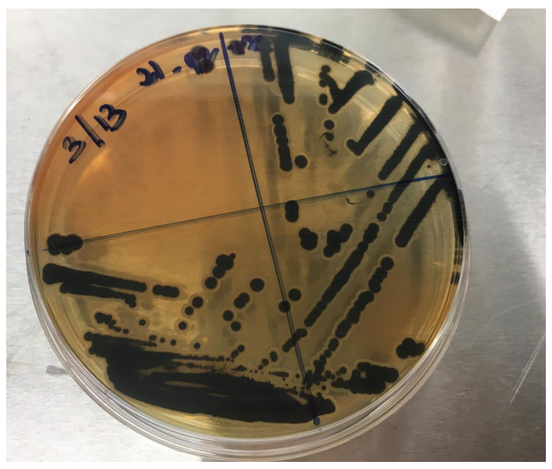

Fig 3: Bacterial isolation *Salmonella* black centre on the right and *S. aureus* black with opaque on the left.

Discussion and conclusions

The study found that almost half of the samples collected were positive for these zoonotic pathogens that can cause serious disease in human. Previous studies have reported high prevalence of antibiotic resistance among common foodborne bacteria, including *E. coli* and *Salmonella* spp. and others (Lay et al., 2011, Trongjit et al., 2017). The quantitative antimicrobial sensitivity test will be considered in the next surveillance plan and risk reduction activities plan. The total of 488 samples in 14 provinces of Cambodia will be collected from March to May 2019 and re-sampling in 4 provinces in September 2019.

References

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ISO 6579:2002. Microbiology of food and animal feeding stuffs -- Horizontal method for the detection of *Salmonella* spp.

ISO 6888-1:1999. Microbiology of food and animal feeding stuffs -- Horizontal method for the enumeration of coagulase-positive staphylococci (Staphylococcus aureus and other species) – Part 1: Technique using Baird-Parker agar medium