

Salmonella prevalence across different pork value chains in Hanoi, Vietnam



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INTRODUCTION

- In Vietnam, **pork and pork products** still play an important role in food security which **contributes more than 56% of total meat intake**. Each Vietnamese consumed approximately 29,1 kg pork/year, among the highest in the world.
- Along with the development, the **pork value chain has been criticized for its quality degradation and lessened the trust of community**, in which **microbiology contaminated pork has been a critical issue**. Previous studies reveal that salmonella contaminated in pork was so prevalence with **44.4% to 70.7 % of pork in markets positive with Salmonella**, leading to **human salmonellosis with 17.7% cases** out of whole Vietnamese population.



Figure 1. Different pork value chains in Hanoi, Vietnam

- Hanoi is the second biggest city in the country. To response to the high demand of consumer, **pork is allocated through many distribution channels, from common to high-end level**. However, evidences on the current state of pork across different value chains is still limited. Therefore, this research attempts to determine the Salmonella prevalence in various pork retail type and generate the clear evidence, which will contribute to the ambitious goal to combat with food safety issue in Vietnam.

METHODS

- Raw pork was collected in retails from different actors in Cau Giay District, Hanoi from July to November 2018. Each sample was coded with identification and linked to checklist codes.
- Each sample was put in a labelled aseptic plastic bag then all samples were preserved in cool boxes and transported to the Laboratory before 24 hours following. Totally, there were **211 samples collected** from both tradition (traditional market, wet market) and modern retail (supermarket, convenient store, boutique shop).
- Salmonella was detected by **qualitative method (following ISO 6579:2017)** and **quantitative method (MPN method)**. Checklist was also used to observe the hygiene of pork shop and practice of retailers.

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RESULTS & DISCUSSION

Value chain	Sal Y/N	95%CI	Sal MPN (Mean ± SD)
Modern retail (105)	55.2%	45.2-64.9%	15.8 ± 35.2
Supermarket (35)	82.9%	66.3-93.4%	16.8 ± 35.4
Convenience store (48)	45.8%	31.3-60.8%	19.5 ± 40.0
Boutique shop (22)	31.8%	13.8-54.9%	0.5 ± 1.1
Informal retail (106)	70.7%	61.1-79.2%	11.1 ± 25.7
Traditional market (54)	81.5%	68.6-90.7%	9.1 ± 19.7
Wet market (52)	59.6%	45.1-73.0%	13.9 ± 32.5
Total (211)	63.0%	56.1-69.6%	13.2 ± 30.2

Out of 211 pork samples, the percentage of sample positive with *Salmonella* was high with **63%**, the average *Salmonella* concentration was **13.2 MPN/g**. The modern retail showed a better result in *Salmonella* with the counterpart; however, supermarket was seen as the worst value chain with 82.9% positive sample while this figure in boutique shop was just 31.8%.

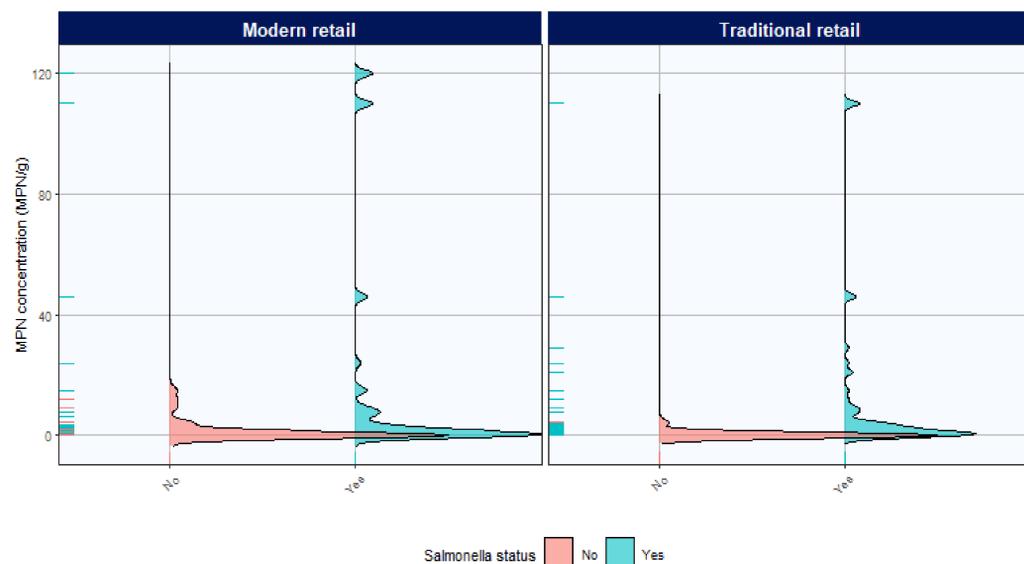


Figure 2. Comparing Salmonella presence between modern and traditional pork value chain in Hanoi



- Results from observation revealed that pork in modern retail was often wrapped, kept at cool cabinet and sometimes visible stamp by meat inspection authority. By contrast, pork from traditional retail mostly stemmed from suburban areas in the vicinity of Hanoi, be transported with the average distance of 31 km and sold without cover. In addition, hygiene practices of pork sellers were also poor, e.g., only 16% using gloves and 3% wearing hat and no separation between pork and intestines.
- Although **the hygienic practices at modern retail was better than traditional retail** (e.g. pork was covered, storage in cool temperature), **pork still high contaminated with Salmonella**, which might be caused by potential high contamination during slaughter, processing and an extended storage time in the shop.

CONCLUSION

- Poor food safety (FS) outcomes shown by moderate to high presence of Salmonella in pork and hygienic deficits across all retail types
- The observed lower Salmonella contamination in boutique shops and management practice may be further explored in terms of its feasibility for other pork retail