

Efficacy of light-touch interventions to improving the safety of pork from small-scale pig slaughterhouses and traditional pork shops in Vietnam

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Background

Pork is one of the most widely eaten animal source food in Vietnam, consumed by more than 95% of the population. Most pork is produced by traditional farmers and sold in wet or informal markets which mostly do not benefit from cold chains. Numerous studies have found high levels of microbial contamination in pork products sold in traditional pork value chains in Vietnam. This urgently requires a feasible solution that improves pork safety. The International Livestock Research Institute and partners, supported by the Australian Centre for International Agriculture Research, have been working for several decades on small-scale pork value chains in Vietnam. They developed a hypothesis that to succeed interventions must be “light-touch” that is affordable, feasible, easy to apply, and supported by incentives. We tested this in a study to provide empirical evidence on the effectiveness of light-touch interventions to reduce the microbial contamination of pork by changing the behavior of slaughterhouse workers and traditional pork sellers.

Materials and Method

The intervention packages included the provision of tools and training for ten small-scale slaughterhouses (capacity varying from 1 to 10 pigs per day) and 29 pork shops (sales volume from 20 to 200 kg pork per day). At the slaughterhouse, we changed the slaughter method from floor-based to grid-based slaughtering via installing a stainless-steel grid that kept pig carcasses from direct contact with the floor. While at the pork shop, we encouraged retailers to maintain hygiene practice by providing them with a set of sanitation tools (cloth, disinfection liquid, sanitation gel and sprayer). Participants were selected based on their possibility of adapting to intervention packages, then a food safety training session was delivered to provide skills and motivation in using the sanitation tools. Before, during and after the intervention, three rounds of sampling were carried out to measure the total bacterial count (TBC) and presence of *Salmonella* contamination of pig carcasses, retailed pork, contact surfaces, and hands of participants. The food safety practice of slaughterhouse workers and pork sellers on the sampling days were also recorded.

Results

The microbial results showed a substantial decrease in TBC in pig carcasses (from nearly 5 to just over 4 log₁₀ CFU/cm²) and likewise a decrease in *Salmonella* prevalence in retailed pork (from around half pork samples being positive to around a quarter) although the TBC in retailed pork reduced only slightly. For surfaces, the slaughter floor saw a dramatic reduction in TBC contamination (from 6 to less than 5 log₁₀ CFU/cm²) while TBC on cutting boards in pork shops marginally decreased. Finally, the TBC on the workers' hands was almost unchanged for both slaughterhouse workers and pork sellers. As regards food safety practice at slaughterhouse,

we found a considerable improvement in the frequency of tools and surface cleaning (from less than 50% to more than 80% frequency) while hand washing and protection wearing seemed to be unchanged (remaining at around 70-80% frequency) across three rounds of observations. At pork shops, the sellers showed significantly increase in the frequency of cleaning hands and cutting board (from 0% to more than 50%) and using the provided tools such as cloths (from very few to more than half) or apron (from around two thirds to nearly all) while maintained a high regularity of cleaning table (more than 70%). However, lack of disinfection and cleaning of hands, tools and surface was observed in both slaughterhouse workers and pork sellers.

Conclusion

The level of bacterial contamination of pig carcasses and retailed pork after the “light-touch” intervention met the Vietnamese standards and was comparable to industrial-scale producers in developed countries. However, the continued commitment of participants in following and maintaining food safety practice is crucial to improve the safety of pork. These results confirmed our hypothesis on the feasibility and effectiveness of light-touch interventions in lowering microbiological contamination in traditional pork products.