

Risk Assessment of Pork Supply Chain in Peri-urban Hanoi

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ILRI

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Pork Consumption in Vietnam

- ✓ Pork is the dominant meat consumed in the Vietnamese diet (30%-40% meat expenditure).
- ✓ Pork and other meat demand is growing as the economy grows and more options are accessible to increasingly affluent Vietnamese consumers.
 - ✓ Demand for pork is relatively inelastic to income.
- ✓ Open permanent and temporary markets are the main outlets of pork purchase (65% and 31% respectively). Modern outlets such as supermarket, convenience stores and shops of branded meat present in big cities but not widely available even there.

Pork Consumption and Food Safety

- ✓ Food safety and hygiene are major concerns of consumers, especially in big cities.
- ✓ During zoonotic disease outbreaks, consumers tend to reduce or stop pork consumption or turn to perceptively more safe market outlets.
- ✓ Safety of fresh pork in open markets is poorly monitored. Consumers buy pork based on observation and experience.

Participatory Risk Assessment Approach

- ✓ Identify existing pork supply chains in Hanoi and surrounding areas with focus on traditional and modern market chains.
- ✓ Design risk assessment strategy to evaluate risks along the chains, using “farm to fork” approach.
- ✓ Mixed methods: participatory appraisals, questionnaires and check lists, rapid diagnostic tests

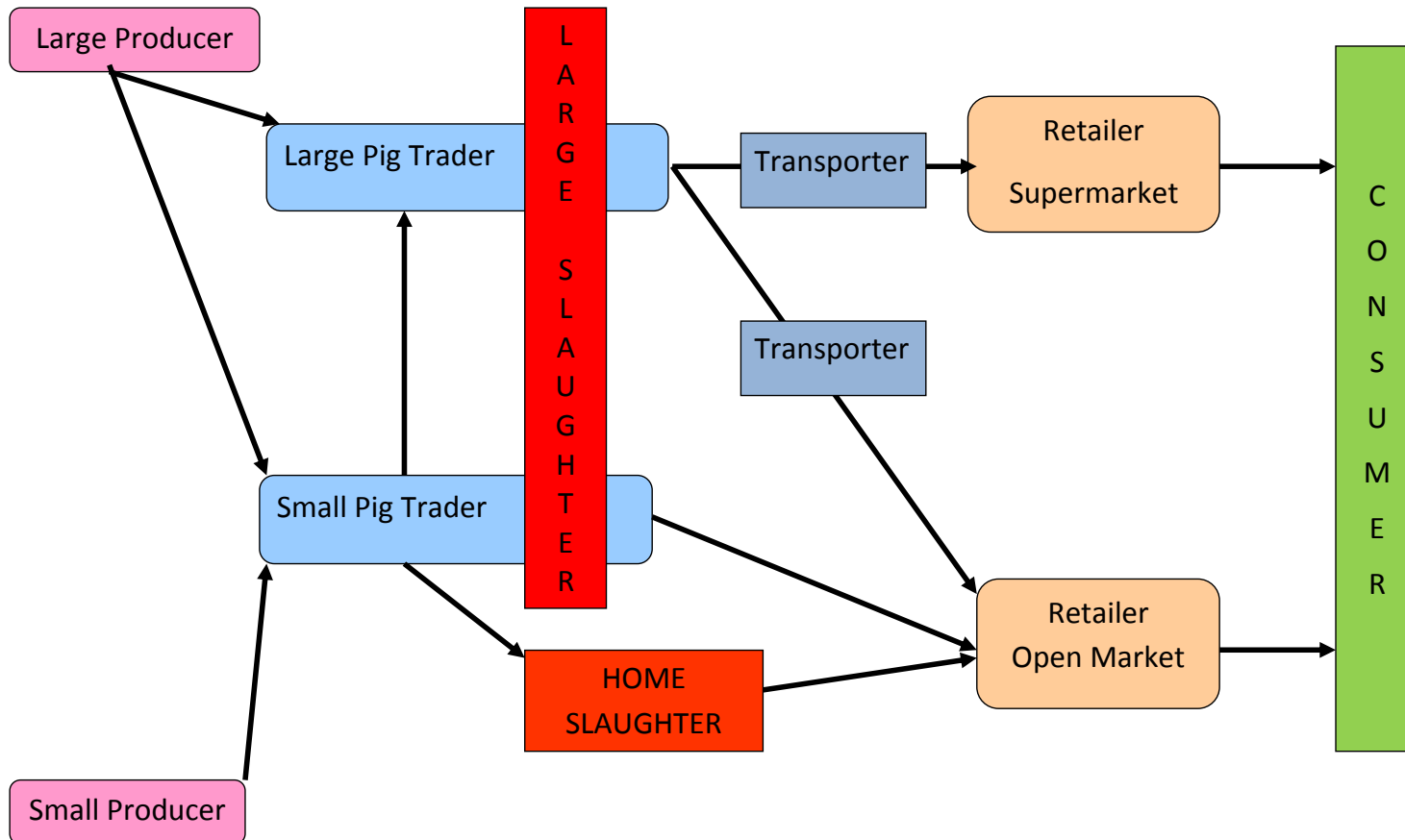
Risk Assessment Strategy

- ✓ Identify a representative urban district in Hanoi (Thanh Xuan district) and 3 representative peripheral districts in former Hatay (Hoai Duc, My Duc, Dan Phuong), based on local animal health department's report on pork risk and safety.
- ✓ Randomly select markets, which have more than five pork retailers that sell more than 50 kg carcass per day, in the district (3 supermarkets, 5 open markets in Hanoi and 3 open markets in HaTay)
- ✓ Randomly select retailers that sell more than 50 kg carcass per day in the markets (3 supermarkets, 5 from each open markets in Hanoi, 10 from 3 open markets in HaTay)
- ✓ Take pork samples from each retailer, fill retailer questionnaires and checklists, interview 4 consumers that buy pork from each of them.
- ✓ Visit three centralized slaughterhouses in urban Hanoi that supply carcass to those retailers. Take blood and faecal samples, fill slaughter checklists, transporter checklists from these and 5 homeslaughters in HaTay.
- ✓ Identify source of pigs in Hanoi, carry out three village PRA in HaTay, each with 7-10 pig producers. Visit 6 farms in each village and fill in producer checklists.

Risk Assessment Strategy

- **Proportional piling:** a tool to assess the proportion of pigs born in, or bought to, the village, and those removed by slaughter or death, or sold outside the village in relation to the village herd. The proportional piling was carried out with beans representing the pigs and a circle on paper depicting the village.
- **Disease and symptoms matrix:** a tool to list and rank diseases and syndromes considered important by farmers. Brainstorming was used to develop disease and symptom lists that were then ranking according to agreed criteria of importance.
- **Focus group discussion:** a tool to understand the problems of pig diseases in their context and how generalisable the results of the PRA were taking into account the characteristics of the participants.

Pork Supply Chains in Hanoi



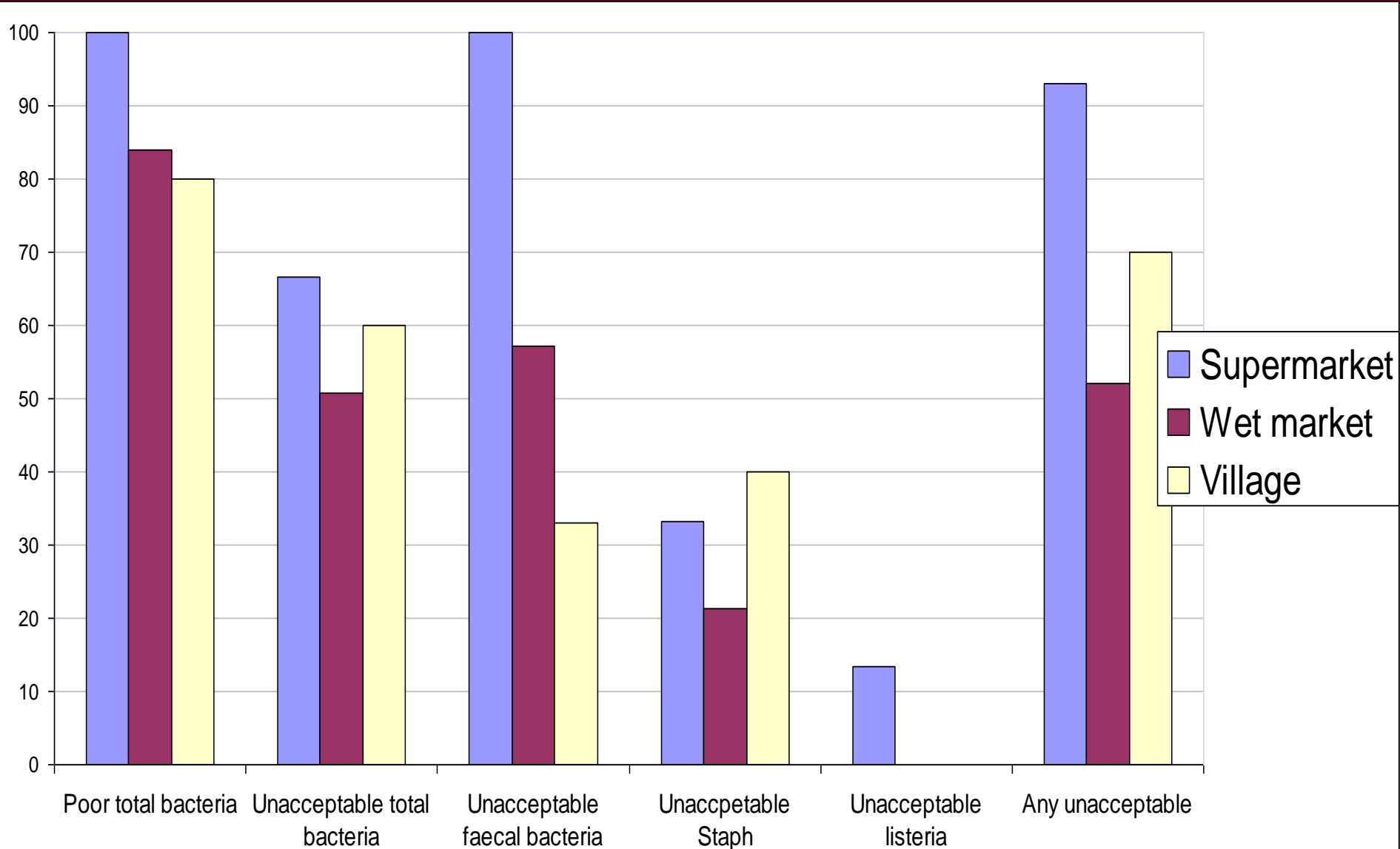
Respondents in Pig Supply Chains in Hanoi

Respondent		Number		Location
		Sample taken	Interviewed/ Observed	
Producer		N/A	18	3 communes in 3 peripheral districts
Slaughter	Large	101	7	7 slaughters in 3 big slaughterhouses in central Hanoi
	Home	10	0	Homeslaughters in Thanh Oai dist
Transporter		N/A	3	Thinh Liet, Dai Hong and Nguyen Van Tuan slaughterhouses
Retailer	Supermarket	15	3	3 supermarkets in Thanh Xuan dist
	Open market	85	35	35 retailers in 8 open markets in Thanh Xuan dist
Consumer	Supermarket	N/A	12	3 supermarkets in Thanh Xuan dist
	Open market	N/A	141	8 open markets in Thanh Xuan dist

Hazard Assessment (12 hazards)

Hazard	Hazard characterisation	Present	Unaccept able
Total bacteria	Cause spoilage and disease	70%	52%
Enterobacteriaceae	An indication of faecal contamination Many food-borne diseases are transmitted through	86%	62%
Staphylococcus aureus	One of the big 10 food-borne diseases. Bacteria produce toxins which are not destroyed by cooking. A good indicator of bad-handling	40%	24%
Listeria monocytogenes	One of the big 10 food-borne diseases. Causes septicaemia, abortion	24%	0%
Antibiotic residues	Can cause reactions in sensitive people Fosters development of resistance in bacteria affecting humans. Many are not destroyed by cooking	9%	9%

Hazard Assessment



Risk assessment

- ✓ Low incidence of self-reported gastro-intestinal illness
 - ✓ 6.5% of households report illness last 6 months
 - ✓ 1.3% of households report illness last month
 - ✓ (possible under-reporting, but.....

- ✓ High level of risk mitigating practice
 - ✓ 100% of respondents cooked food within 3 hours of purchase
 - ✓ 98% cooked for >10 minutes
 - ✓ 99% report hand washing
 - ✓ 58% keep in fridge

Risk assessment

- ✓ Consumption of pork does not predict illness
- ✓ Consumption of other meat does not predict illness
- ✓ Consumption of vegetables strongly predicts illness
 - ✓ Healthy households 1.6kg veggies a week
 - ✓ Sick households 3.1 kg veggies a week $p=0.03$
- ✓ Household practices also predict illness ($p<0.05$)
 - ✓ Eating leftovers without reheating Odds ratio 6
 - ✓ Good hand washing practice Odds ratio 0.12
 - ✓ Having animals in the hh Odds ratio 3

Contra-intuitive insights

- ✓ Hazard does not imply risk
- ✓ Supermarket does not imply safe
- ✓ Veggies are more risky than pork
- ✓ Household practices important role in determining risk

Conclusions

- ✓ Participatory risk assessment rapid, cheap and appropriately imprecise
- ✓ Pilot study, results need confirmation – hypothesis generating rather than evidence generating
- ✓ Findings support other work by ILRI in informal markets
 - ✓ Generally high levels of unsafe food
 - ✓ Formal markets in poor countries often not safer than informal
 - ✓ Many risk-mitigating practices
 - ✓ Policy should be based on risk and not hazard