Food safety in Vietnam’s livestock sector

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Outline

• Burden of foodborne disease (FBD)
• Emerging evidences on FBD from ILRI research
  • Hazards are usually high but risks vary
  • Benefits of traditional food value chains are often high
  • Formal sector is sometimes but not always safer
  • Control & command regulation doesn’t work well and may lead to low compliance
  • Solutions based on working with and legitimising the informal sector are effective and feasible
• Recommendations for Vietnam
Growing concern about food safety

• Many/most reported concern over food safety (40-97%)

• Willing to pay 5-10% premium for food safety

• Buy 20-40% less during animal health scares

• Younger, wealthier, town-residing, supermarket-shoppers willing to pay more for safety

Nguoi tieu dung, 20.5.2016
FBD- a new priority – most from livestock
Millions DALYs lost per year (global)

31 hazards
• 600 mio illnesses
• 420,000 deaths
• 33 million DALYs

Havelaar et al., 2015
Causes of FBD

Burden LMIC

Havelaar et al., 2015
Informal markets have a major role in food security and food safety

Benefits of wet markets

Cheap, Fresh, Local breeds, Accessible, Small amounts, Sellers are trusted, Credit may be provided

(results from PRAs with consumers in Safe Food, Fair Food project)

<table>
<thead>
<tr>
<th></th>
<th>Wet market milk</th>
<th>Supermarket milk</th>
</tr>
</thead>
<tbody>
<tr>
<td>Most common price /litre</td>
<td>56 cents</td>
<td>One dollar</td>
</tr>
<tr>
<td>Infants consume daily</td>
<td>67%</td>
<td>65%</td>
</tr>
<tr>
<td>Boil milk</td>
<td>99%</td>
<td>79%</td>
</tr>
</tbody>
</table>

Survey in supermarkets and wet markets in Nairobi in 2014
Informal markets provide food for the poor and livelihoods for poor men and women

<table>
<thead>
<tr>
<th>Product</th>
<th>Production</th>
<th>Processing</th>
<th>Marketing</th>
<th>Consumed</th>
</tr>
</thead>
<tbody>
<tr>
<td>Milk (cow)</td>
<td>men (x Nairobi)</td>
<td>women</td>
<td>women (x Abidjan)</td>
<td>both</td>
</tr>
<tr>
<td>Milk (goat)</td>
<td>men (w milk)</td>
<td>women</td>
<td>women</td>
<td>both</td>
</tr>
<tr>
<td>Beef/goat</td>
<td>men (w assist)</td>
<td>men</td>
<td>men (butcher, pub)</td>
<td>both</td>
</tr>
<tr>
<td>Poultry</td>
<td>women</td>
<td>women</td>
<td>women</td>
<td>both</td>
</tr>
<tr>
<td>Pigs</td>
<td>women</td>
<td>men</td>
<td>men</td>
<td>both</td>
</tr>
<tr>
<td>Fish, crabs</td>
<td>men</td>
<td>women</td>
<td>women</td>
<td>both</td>
</tr>
</tbody>
</table>
Hazards are high but risks vary

Fail standards: bacteria

- 100% milk in Assam, India
- 98% of raw meat in Ibadan, Nigeria
- 94% of pork in Nagaland, India
- 77% farmed fish in Egypt

Fail standards: chemical

- 92% milk in Addis Ababa
- 46% milk in Kenya

Diarrhoea in last 2 weeks

- 0.02% consumers in Canada
- 0.02% raw milk buyers in Kenya
- 23% consumers in Nagaland
- 43% Nigerian butchers
Compliance: Formal often worse than informal

Fahrion et al, 2013
### Formal vs traditional markets in Vietnam

<table>
<thead>
<tr>
<th></th>
<th>Super-markets</th>
<th>Whole-sale markets</th>
<th>Retail markets</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Hanoi</strong> Quantity (tons/day)</td>
<td>94.5</td>
<td>17.5</td>
<td>518</td>
<td>630</td>
</tr>
<tr>
<td><strong>Share of volume</strong></td>
<td>15%</td>
<td>3%</td>
<td>82%</td>
<td>100%</td>
</tr>
<tr>
<td><strong>No of markets/stores</strong></td>
<td>103</td>
<td>4</td>
<td>426</td>
<td></td>
</tr>
</tbody>
</table>

- 30,000 small slaughterhouses
- 11,000 wet markets
- 110,000 butchers (most women)
- Around 10,000 industrial pig farmers and 4 million small-scale pig farms
To assess impacts of pork-borne diseases on human health and the livestock sector and identify control points for risk management.

Focus on risk based approaches
Qualitative/quantitative risk assessments

Multi-disciplinary team
Vets, PH, Economist, Environment

Data collected
Input suppliers, Producer, slaughterhouse, Trader, Market, Consumers
Biological sampling, questionnaires, participatory epidemiological tools
Study sites – PigRisk

Provinces
Hung Yen
Nghe An

Districts
Khoai Chau
Van Giang
Tien Lu
Do Luong
Dien Chau
Hung Nguyen

Communes
Nhuệ Dương
Đại Hưng
Bình Kiều

Nghĩa Trụ
Tân Tiến
Thàng Lợi

Đức Thắng
Minh Phượng
Thu Sỹ

Thương Sơn
Đà Sơn
Lâm Sơn

Diên Lâm
Diên Nguyên
Diên Kim

Hung Dạo
Hung Phúc
Hung Thông

R: Rural
P: Peri – urban
U: Urban
Risk assessment

- *Salmonella* risk pathways developed for producers, slaughterhouse and consumers
- Quantitative RA (risk for consumer)

1275 samples (farms, SH, market) collected during 1 year
# PigRIsk - Results on microbial analysis

<table>
<thead>
<tr>
<th>Actor</th>
<th>Sample type</th>
<th>Pos/Total</th>
<th>Prev (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Producer</td>
<td>Drink-FA</td>
<td>14/72</td>
<td>19.4</td>
</tr>
<tr>
<td>Producer</td>
<td>FloSwab-FA</td>
<td>26/72</td>
<td>36.1</td>
</tr>
<tr>
<td>Producer</td>
<td>WasteW-FA</td>
<td>28/72</td>
<td>38.9</td>
</tr>
<tr>
<td>Slaughter house</td>
<td>CarcassSwab</td>
<td>58/149</td>
<td>38.9</td>
</tr>
<tr>
<td>Slaughter house</td>
<td>Feces</td>
<td>50/149</td>
<td>33.6</td>
</tr>
<tr>
<td>Slaughter house</td>
<td>Mesenteric LN</td>
<td>53/149</td>
<td>35.6</td>
</tr>
<tr>
<td>Slaughter house</td>
<td>SwabFlo-SH</td>
<td>11/49</td>
<td>22.4</td>
</tr>
<tr>
<td>Slaughter house</td>
<td>Water-SH</td>
<td>10/49</td>
<td>20.4</td>
</tr>
<tr>
<td>Market</td>
<td>Pork</td>
<td>97/217</td>
<td>44.7</td>
</tr>
<tr>
<td>Market</td>
<td>Pork-Gr</td>
<td>33/80</td>
<td>41.3</td>
</tr>
<tr>
<td>Market</td>
<td>CutSwab</td>
<td>55/217</td>
<td>25.3</td>
</tr>
<tr>
<td>Market</td>
<td>Overall</td>
<td>435/1275</td>
<td>34.1</td>
</tr>
</tbody>
</table>
Selected key results: Chemical hazards

514 pig feed, kidney, liver and pork samples were pooled into 18 samples were analysed for antibiotic residues, β-agonists, and heavy metals, compared with current regulations.

Presence of banned substances (e.g. chloramphenicol and the growth promoter salbutamol in pig feed and sold pork)

Most of samples: negative or did not exceed current MRL

Tuyet Hanh et al, 2016 (submitted)
Selected key results: Food safety

*Streptococcus suis* in slaughter pigs (N=147):

S. *suis* type 2, low prevalence (1.4%)

Potential risk behaviors such as consumption of “Tiet canh”

– a raw pig blood dish was common in slaughterhouse workers (43.1%)

Cross-contamination survey (*Salmonella*) (N=153)

Among various simulation scenarios, using the same cutting board induced the highest risk of cross-contamination with *Salmonella* (66.7%), followed by the same knife (11.1%) respectively

Health risk by QMRA: The annual incidence rate of salmonellosis was estimated to be 12.6% (90% CI: 0.5 – 42.6). The factors most influencing the estimate were household pork handling practice followed by prevalence in pork sold in the central market.

*Dang Xuan Sinh et al, 2016 (submitted)*
Improvements are feasible, effective, affordable

- Training & branding for butchers in Nigeria:
  - 20% more meat samples met standards
  - Cost $9 per butcher
  - Saved $780/per butcher per year from reduced cost of human illness

- Providing information on (rational drug use) to farmers
  - Knowledge increase x 4,
  - Practice improvement x 2,
  - Disease decrease by 1/2
Training & certifying milk vendors

• Branding & certification of milk vendors in Kenya & Guwahti, Assam led to improved milk safety.

• It benefited the national economy by $33 million per year in Kenyan and $6 million in Assam

• 70% of traders in Assam and 24% in Kenya are currently registered

• 6 million consumers in Kenya and 1.5 million in Assam are benefiting from safer milk
Efforts in managing food safety in informal markets must be pro-poor

• The poor are more prone to food-borne disease but cannot afford to fall ill
• Risk management needs training, skills development and prerequisites
• Linking formal and informal markets can decrease poverty
• Impact assessment on economic losses and gains of food safety risks is needed
Recommendations for Vietnam

• Balance between formal and “wet/traditional” markets
• Training informal value chain actors: training farmers on input use and good practices (GAP), training & certifying food vendors, incentive based interventions
• Demand side: increased awareness of consumers
• New technologies
• Needs of evidences on health impacts of food safety
Recommendations for Vietnam

- Risk communication needs to focus on banned chemicals, while informing the public about the minimal risks associated with heavy metals (situation is not that severe)
- Food system governance: improved food safety institutional framework, regulations, application of risk-based management

Acknowledgement
better lives through livestock

ilri.org