Current situation of Food Safety in Vietnam

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Hanoi University of Science and Technology (HUST)

- Established in 1956, leading university in the field of science and technology
- 20 schools, 14 research institutes
- 2,200 employees
- 35,000 undergraduates
- 4,000 postgraduates.
FOOD POISONING OUTBREAKS IN VIETNAM
2000 - 2010 *

Since 1990, Food safety has becoming among the most concern and priority issues in Vietnam.

Number of food poisoning cases 2000-2010

<table>
<thead>
<tr>
<th>N</th>
<th>Year</th>
<th>Number of outbreaks (cases)*</th>
<th>Infected</th>
<th>Deaths</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>2000</td>
<td>213</td>
<td>4.233</td>
<td>59</td>
</tr>
<tr>
<td>2</td>
<td>2001</td>
<td>245</td>
<td>3.901</td>
<td>63</td>
</tr>
<tr>
<td>3</td>
<td>2002</td>
<td>218</td>
<td>4.984</td>
<td>71</td>
</tr>
<tr>
<td>4</td>
<td>2003</td>
<td>238</td>
<td>6.428</td>
<td>37</td>
</tr>
<tr>
<td>5</td>
<td>2004</td>
<td>145</td>
<td>3.584</td>
<td>41</td>
</tr>
<tr>
<td>6</td>
<td>2005</td>
<td>144</td>
<td>4.304</td>
<td>53</td>
</tr>
<tr>
<td>7</td>
<td>2006</td>
<td>165</td>
<td>7.135</td>
<td>57</td>
</tr>
<tr>
<td>8</td>
<td>2007</td>
<td>247</td>
<td>7.329</td>
<td>55</td>
</tr>
<tr>
<td>9</td>
<td>2008</td>
<td>205</td>
<td>7.828</td>
<td>61</td>
</tr>
<tr>
<td>10</td>
<td>2009</td>
<td>152</td>
<td>5.212</td>
<td>35</td>
</tr>
<tr>
<td>11</td>
<td>2010</td>
<td>175</td>
<td>5.664</td>
<td>51</td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td></td>
<td>2,147</td>
<td>60,602</td>
</tr>
</tbody>
</table>

Average rate of food poisoning / 100,000 habitats

- Number of cases not decreased for 10 years treated as priority issue
- Number of the cases under officially reported lower from real situation,
Food poisoning outbreak reported from 2002-2010

- Official outbreak reported under-estimated
- Data on contaminant nature not available

- Weaknesses in the food poisoning surveillance system
- Lack of resources for food safety management

*, source: Lam Quoc Hung, VFA, 2010
Emerging Food Contaminants

- Unauthorized Additives
  - Non-food color
  - Restructured food
- Preservatives
  - Chemicals (Urea, sorbat...)
  - Pesticide/fungicide
  - Antibiotics
- Environment contaminants
  - Heavy metal
  - Pesticide residue
  - Pathogens
- Technological toxins
  - 3-MCPD
  - Acrylamide, etc
10/2011: Malachite green detected in young rice snack («Cốm»): 1.5-5.9 mg/kg cốm (>>2 ug/kg)

5/2012: imported fruits wrapped by pesticide-paper

- Vietnam is one of countries imports fruits from China
- China had recalled 2.7 millions wrapping bags coated with thiram and melarsoprol pesticides used in fruit plantation
Safety in Meat industry

- Clenbuterol/Salbuterol in pork feed

Clenbuterol supplements is used to increase the muscles while ensuring that body fat burn out, residu in the porc meat

- On-site detection
- Feed control and management
• Microorganism contamination
  ▪ **pathogens prevalence in foodstuff**
    o *Salmonella*: pork: 39.6% (fermented meat)
      • Chicken 42.9-49%
      • Beef: 62%
    o *Campylobacter jejuni*: 10-37% (Chicken)
    o *L. monocytogenes*: 14% (sausage)
    o *E. coli*
    o *S. aureus*
    o *B. cereus*
    o *C. perfingen*

• Hygiene issue
• Starter culture
• On-site, rapid assay for screening/self control of microbial contaminant: timing and sensitivity
### Antibiotic resistant food born pathogens

<table>
<thead>
<tr>
<th></th>
<th>Tetra cycline</th>
<th>Sulphonamides</th>
<th>Streptomycin</th>
<th>Ampicillin</th>
<th>Chlor amphenicol</th>
<th>Trimetoprim</th>
<th>Nalidixic acid</th>
<th>Amoxicillin</th>
<th>Gentamicin</th>
<th>Fluoroquinolones</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Salmonella</strong></td>
<td>58.5</td>
<td>58.1</td>
<td>47.3</td>
<td>39.8</td>
<td>37.3</td>
<td>34.0</td>
<td>27.8</td>
<td>-</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td><strong>E. coli</strong></td>
<td>77.8</td>
<td>60.6</td>
<td>39.4</td>
<td>50.5</td>
<td>43.4</td>
<td>51.5</td>
<td>34.3</td>
<td>50.5</td>
<td>24.2</td>
<td>16-21.2</td>
</tr>
</tbody>
</table>

**; Thi et al., 2008

- Control antibiotic abuse in animal feed
- Feed ingredients development
Aquaculture production

• Vietnam is a large exporter of Aquaculture products to US, EU (37.9 thousands tonnes, 10.3 % increased) and Japan.

• Main product:
  – Shrimps (*Penaeus monodon*)
  – Catfish (*Pangasianodon hypophthalmus* and *Pangasius bocourti*)
Safety issue in Aquaculture in VN

- Contaminated and diseases
- Use of antibiotics associated with the increase of bacterial resistance in the exposed microbial environment (water, sediment, fish bacteria)
- Environment pollution in aquaculture affected seafood safety
- EU set zero tolerance in aquacultural products for imported seafoods; barrier to overcome:
  - Good practice (GAP)
  - Aquaculture «vaccination» or authorized antitibiotics
  - Analysis competence and harmonization
Research experiences

Technological improvement for Food Quality

Starter culture for traditionally fermented foods

LAB Probiotics for quality improvement of fermented meat and vegetable foods

Antagonist fungi to reduce aflatoxin contamination in rice

Probiotics for aquaculture feeds

Rapid analysis

Lateral flow immunological test for rapid detection of SEA (RT) PCR (RT) /LAMP detection of *L. monocytogenes*, HAV,

LAMP method for distinguishing between *Pangasius bocourti* and *Pangasius hypophthalmus*

Networking and Capacity building

Monitoring and Quality Assurance in the total food supply chain
Cooperation needs to respond to the needs:

- Analysis harmonization and HRD
- Proper preservatives, and replication in VN
- “Vaccination” for husbandry and aquaculture
- Safer, Better and Healthy feeds for animals
- Rapid and on-site detection (sensitivity improvement)
- Warning system for pathogens/environment contamination
Thank you for your listening and cooperation