SPICED
Securing the spices and herbs commodity chains in Europe against deliberate, accidental or natural biological and chemical contamination

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Shortened and non-confidential version
Outline

1. Introduction
2. Matrix chains and modelling
3. Food control and limiting factors
4. Biological hazards
5. Chemical hazards
6. The SPICED project
# Foodborne outbreaks in the EU

<table>
<thead>
<tr>
<th>Year</th>
<th>Number of foodborne outbreaks</th>
<th>Outbreaks with identified Foodstuff*</th>
</tr>
</thead>
<tbody>
<tr>
<td>2008</td>
<td>5332</td>
<td>890</td>
</tr>
<tr>
<td>2009</td>
<td>5550</td>
<td>977</td>
</tr>
<tr>
<td>2010</td>
<td>5262</td>
<td>698</td>
</tr>
<tr>
<td>2011</td>
<td>5648</td>
<td>701</td>
</tr>
</tbody>
</table>

* verified or strong evidence outbreaks

Source: EFSA
# Microbial contaminations in spices - Foodborne illness Outbreaks (examples)

<table>
<thead>
<tr>
<th>Date</th>
<th>Country (Origin)</th>
<th>Spice</th>
<th>Pathogens</th>
<th>Total cases</th>
<th>Hospitalizations (Deaths)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1973-74</td>
<td>Canada (India)</td>
<td>Pepper</td>
<td>S. Weltevreden</td>
<td>17</td>
<td>1 (0)</td>
</tr>
<tr>
<td>1981-82</td>
<td>Norway (Brasil)</td>
<td>Pepper</td>
<td>S. Oranienburg</td>
<td>126</td>
<td>&gt;25% (min. 1)</td>
</tr>
<tr>
<td>1993</td>
<td>Germany (South Africa)</td>
<td>Paprika</td>
<td>var. <em>Salmonella</em></td>
<td>~1000</td>
<td>unknown</td>
</tr>
<tr>
<td>2002</td>
<td>England/Wales (India)</td>
<td>Curry powder</td>
<td>S. Braenderup</td>
<td>20</td>
<td>1 (0)</td>
</tr>
<tr>
<td>2002-03</td>
<td>Germany (Turkey)</td>
<td>Anise seed</td>
<td>S. Agona</td>
<td>42</td>
<td>21 (0)</td>
</tr>
<tr>
<td>2007</td>
<td>U.S. (China)</td>
<td>Seasoning mix</td>
<td>var. <em>Salmonella</em></td>
<td>69</td>
<td>8 (0)</td>
</tr>
<tr>
<td>2007</td>
<td>France (unknown)</td>
<td>Spice mix</td>
<td><em>B. cereus</em></td>
<td>146</td>
<td>0 (0)</td>
</tr>
<tr>
<td>2007-08</td>
<td>Serbia (unknown)</td>
<td>Fennel seed</td>
<td>S. Senftenberg</td>
<td>14</td>
<td>4 (unknown)</td>
</tr>
<tr>
<td>2008-09</td>
<td>U.S. (Vietnam)</td>
<td>Pepper</td>
<td>S. Rissen</td>
<td>87</td>
<td>22 (1)</td>
</tr>
<tr>
<td>2009-10</td>
<td>U.S. (Vietnam etc.)</td>
<td>Pepper</td>
<td>var. <em>Salmonella</em></td>
<td>283</td>
<td>52 (0)</td>
</tr>
<tr>
<td>2010</td>
<td>Denmark (unknown)</td>
<td>Pepper</td>
<td><em>B. cereus</em></td>
<td>112</td>
<td>0 (0)</td>
</tr>
</tbody>
</table>

Sources: Van Doren et al., 2013; Zweifel and Stephan, 2012; Mahler, 2004
Spices and herbs market

- Increasing global consumption
- Low levels of inclusion
- Wide spread
- Hygienization/decontamination reduces product quality
- End users
  - industrial (55-60%)
  - retail (35-40%)
  - catering sector (10-15%)

Sources: FAO, 2013; CBI Market Survey, 2009
Food control criteria for spices and herbs

- **Chemical criteria** defined by EU law (e.g.)
  - Pesticide residues
  - Mycotoxins
  - Heavy metals
  - Dioxins, dioxin-like PCBs, furans
  - Harmful dyes
  - Additives

- **Microbiological criteria** recommended in the EU by (e.g.)
  - Codex Alimentarius
  - European Commission
  - German hygiene association
RASFF – Notifications
(1979 – 2012, all categories, n = 34122; without „sudan red“ notifications)

Source: RASFF portal, 2013
RASFF - (pathogenic) microorganisms
(1979 – 2012, category = spices and herbs, n = 654)

- Salmonella: 64%
- Escherichia coli: 10%
- Moulds: 10%
- Bacillus spp.: 10%
- Enterobacteriaceae: 5%
- Yeast: 2%
- Others: 3%

Source: RASFF portal, 2013
Hazard categorization

Top agent alerts for spices and herbs (RASFF)

1) *Salmonella* spp. (n=418)
2) *Bacillus* spp. (n=42)

Top matrix–agent combinations linked to foodborne human cases in food of non-animal origin

1) *Bacillus* spp. + spices and dry powdered herbs
2) *Salmonella* spp. + spices and dry powdered herbs
Project structure

Workpackage 1: Management and Coordination

Workpackage 2: Matrix Chains and Modelling

Workpackage 3: Biological Hazards

Workpackage 4: Chemical Hazards

Workpackage 5: Prevention and Response

Workpackage 6: Sustainability and Dissemination

This project has received funding from the European Union’s Seventh Framework Programme for research, technological development and demonstration under grant agreement n° 312631.
SPICED in brief

Duration 3 years (start July 2013)
Budget 4.6 Mio Euro
Coordinator

Project partners

Associated partners

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Thanks for your attention. Questions and comments?

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