International / National Standards for Heavy Metals in Food

Dr YY Choi
Chemist
Government Laboratory
October 2011
Local Situation

**Cap. 132V Food Adulteration (Metallic Contaminants) Regulations**

- **First Schedule**: Maximum permitted concentration of certain metals naturally present in specified foods

<table>
<thead>
<tr>
<th>Metal</th>
<th>Description of food</th>
<th>Maximum permitted concentration in parts per million</th>
</tr>
</thead>
<tbody>
<tr>
<td>Arsenic (AS₂O₃)</td>
<td>Solids being fish and fish products</td>
<td>6</td>
</tr>
<tr>
<td></td>
<td>Solids being shellfish and shellfish products</td>
<td>10</td>
</tr>
</tbody>
</table>
**Local Situation – Cont’**

*Second Schedule: Maximum permitted concentration of certain metals in specified foods*

<table>
<thead>
<tr>
<th>Metal</th>
<th>Description of food</th>
<th>Maximum permitted concentration in parts per million</th>
</tr>
</thead>
<tbody>
<tr>
<td>Antimony (Sb)</td>
<td>Cereals and vegetables</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>Fish, crab-meat, oysters, prawns and shrimps</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>Meat of animal and poultry</td>
<td>1</td>
</tr>
<tr>
<td>Arsenic (As₂O₃)</td>
<td>Solids other than-</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(i) fish and fish products; and</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(ii) shellfish and shellfish products</td>
<td></td>
</tr>
<tr>
<td></td>
<td>All food in liquid form</td>
<td>0.14</td>
</tr>
<tr>
<td>Cadmium (Cd)</td>
<td>Cereals and vegetables</td>
<td>0.1</td>
</tr>
<tr>
<td></td>
<td>Fish, crab-meat, oysters, prawns and shrimps</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>Meat of animal and poultry</td>
<td>0.2</td>
</tr>
</tbody>
</table>
### Second Schedule: Maximum permitted concentration of certain metals in specified foods

<table>
<thead>
<tr>
<th>Metal</th>
<th>Description of food</th>
<th>Maximum permitted concentration in parts per million</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chromium (Cr)</td>
<td>Cereals and vegetables</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>Fish, crab-meat, oysters, prawns and shrimps</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>Meat of animal and poultry</td>
<td>1</td>
</tr>
<tr>
<td>Lead (Pb)</td>
<td>All food in solid form</td>
<td>6</td>
</tr>
<tr>
<td></td>
<td>All food in liquid form</td>
<td>1</td>
</tr>
<tr>
<td>Mercury (Hg)</td>
<td>All food in solid form</td>
<td>0.5</td>
</tr>
<tr>
<td></td>
<td>All food in liquid form</td>
<td>0.5</td>
</tr>
<tr>
<td>Tin (Sn)</td>
<td>All food in solid form</td>
<td>230</td>
</tr>
<tr>
<td></td>
<td>All food in liquid form</td>
<td>230</td>
</tr>
</tbody>
</table>
International / National Standards

Available International / National Standards:
- Codex Alimentarius Commission (CODEX)
- Mainland
- US Food and Drug Administration (FDA)
- European Commission (EU)
- Australia
Codex standards

- CODEX STAN 193-1995 (Amendment: 2010)
  - Established Maximum of Five Heavy metals
    - Arsenic
    - Cadmium
    - Lead
    - Mercury (including methylmercury)
    - Tin

http://www.codexalimentarius.net/download/standards/17/CXS_193e.pdf
Mainland

● GB Standard

● GB 2762: Maximum levels of contaminants in food
● Established maximum levels of SIX heavy metals:
  ● Arsenic
  ● Cadmium
  ● Chromium
  ● Lead
  ● Mercury (including methylmercury)
  ● Tin
USA

- US Food and Drug Administration (FDA)
  - Maximum level in selected food
    - Mercury (including methylmercury)
  - Allowable levels in bottled water
    - Arsenic
    - Antimony
    - Cadmium
    - Chromium
    - Lead
    - Mercury
USA – Cont’

- Recommended maximum level in Candy likely to be frequently consumed by children
  - Lead
    - [http://www.fda.gov/Food/GuidanceComplianceRegulatoryInformation/GuidanceDocuments/ChemicalContaminantsandPesticides/ucm077969.htm#cadm](http://www.fda.gov/Food/GuidanceComplianceRegulatoryInformation/GuidanceDocuments/ChemicalContaminantsandPesticides/ucm077969.htm#cadm)
European Commission

- Commission Regulation (EC) No. 1881/2006 - maximum of FOUR heavy metals in foodstuff
  - Cadmium
  - Lead
  - Mercury
  - Tin

European Commission – Cont’

  - Quality of water intended for human consumption including six heavy metals of interest
    - Arsenic
    - Antimony
    - Cadmium
    - Chromium
    - Lead
    - Mercury

Australia

- Food Standards Australia New Zealand (FSANZ)
  - Food Standards Australia and New Zealand Standard 1.4.1 – Contaminants and Natural Toxicants laid down maximum levels of FIVE heavy metals in specified food
    - Arsenic
    - Cadmium
    - Lead
    - Mercury
    - Tin

Thank You