



Briefing on National and International Standards for Heavy Metals in Food

18 October 2012

Dr. CHOI Ya Yin



Local Situation

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

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

Metal	Description of food	Maximum permitted concentration in parts per million
Arsenic (AS_2O_3)	Solids being fish and fish products	6
	Solids being shellfish and shellfish products	10



Local Situation – Cont'

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

Metal	Description of food	Maximum permitted concentration in parts per million
Antimony (Sb)	Cereals and vegetables	1
	Fish, crab-meat, oysters, prawns and shrimps	1
	Meat of animal and poultry	1
Arsenic (As₂O₃)	Solids other than- (i) fish and fish products; and (ii) shellfish and shellfish products	1.4
	All food in liquid form	0.14
Cadmium (Cd)	Cereals and vegetables	0.1
	Fish, crab-meat, oysters, prawns and shrimps	2
	Meat of animal and poultry	0.2



Local Situation – Cont'

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

Metal	Description of food	Maximum permitted concentration in parts per million
Chromium (Cr)	Cereals and vegetables	1
	Fish, crab-meat, oysters, prawns and shrimps	1
	Meat of animal and poultry	1
Lead (Pb)	All food in solid form	6
	All food in liquid form	1
Mercury (Hg)	All food in solid form	0.5
	All food in liquid form	0.5
Tin (Sn)	All food in solid form	230
	All food in liquid form	230



International / National Standards

★ Available International / National Standards:

- ★ Codex Alimentarius Commission (CODEX)
- ★ China (GB)
- ★ US Food and Drug Administration (FDA)
- ★ European Commission (EU)
- ★ Australia and New Zealand (FSANZ)



Codex standards

★ CODEX STAN 193-1995 (*Amendment: 2010*)

● Established Maximum of Five Heavy metals

- Arsenic (Draft standard on inorganic arsenic)
- Cadmium
- Lead
- Mercury (including methylmercury)
- Tin

CODEX GENERAL STANDARD FOR CONTAMINANTS AND TOXINS
IN FOOD AND FEED

CODEX STAN 193-1995



China

★ GB Standard

★ GB 2762: Maximum levels of contaminants in food

★ Established maximum levels of SIX heavy metals:

- Arsenic (including inorganic arsenic)
- Cadmium
- Chromium (including hexavalent 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
- **Guidance for Industry
Lead in Candy Likely To Be Consumed Frequently by Small Children:
Recommended Maximum Level and Enforcement Policy**
- **Fish and Fishery Products Hazards and Controls Guidance**
 - Fourth Edition, November 2011
- **Guidance for Industry: Action Levels for Poisonous or Deleterious
Substances in Human Food and Animal Feed**
 - August 2000
- **CFR - Code of Federal Regulations Title 21**



European Commission

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



European Commission – Cont'

- Council Directive 98/83/EC

- Quality of water intended for human consumption including six heavy metals of interest

- Arsenic
 - Antimony
 - Cadmium
 - Chromium
 - Lead
 - Mercury



Australia and New Zealand

- 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 (including inorganic arsenic)
- Cadmium
- Lead
- Mercury
- Tin



Highlights

	Cap 132V	National / International
Specificity	<p style="text-align: center;">↓</p> Pb, Hg, Sn: All food in Solid form; all food in liquid form	<p style="text-align: center;">↑</p> More Specific: different limits for different food types. (E.g. CODEX (Lead) : citrus fruits [0.1 ppm]; Leafy vegetable [0.3 ppm]; Fruit juices [0.05 ppm]; etc)
Speciation	Not specified	<p style="text-align: center;">Y</p> CODEX : methylmercury; Inorganic arsenic (draft standard); China : hexavalent chromium (Natural mineral waters)
Limits (<i>Cadmium as example</i>)	Vegetable: 0.1 ppm Natural mineral waters: N/A	CODEX Bulb vegetables: 0.05 ppm Natural mineral waters: 0.003 ppm



Future Challenges

- ✦ Lower detection limits

- ✦ Food types

- ✦ Speciation

- ✦ Method reference:

- FDA: Elemental Analysis Manual (EAM)
EAM 4.8 (MeHg), EAM 4.10 (As speciation)
- GB/T 23372-2009 (As speciation)
- EN 15517:2008 (Inorganic As)



Thank You