Cadmium in Rice

18/9/2013

Background

- In May 2013, it was reported that
  - certain rice and rice products
    - collected by Guangdong authorities, **containing cadmium at levels which did not comply with the Mainland standard**
  - Mainland GB standard for cadmium in rice is ≦ 0.2 mg/kg

Cadmium

- **Nature of Cadmium**
  - a metallic element that occurs naturally in the Earth's crust
  - can be released to the environment by human activities
    - industrial applications e.g. electroplating, nickel-cadmium batteries and electronics, etc.
    - fertilisers produced from phosphate ores and
    - industrial operations such as mining

Cadmium does not break down in the environment

Cadmium

- **Occurrence in Food**
  - plants, animals, fish and shellfish take up cadmium when it is in their growth environment (e.g. soil, air, water, etc)
  - use of cadmium-containing fertilisers and feeding stuffs

Cadmium can go up the food chain when contaminated crops and plants are ingested by animals

Cadmium

Cadmium, which originates from natural sources or from human activities such as mining, can enter rice plant through soil and water.

Cadmium

- **How are People Exposed to Cadmium**
  - Inhale cadmium from work environment containing cadmium fumes and dust,
    - from the smelting and refining of metals, and
    - from the air in plants where cadmium products are made.
  - For the general population, food is the main source of cadmium exposure.

Cadmium

- **Health Effects of Cadmium**
  - acute toxicity of cadmium due to dietary exposure is very unlikely
  - prolonged intake of excessive cadmium may have adverse effects on kidney

Cadmium

- **Health Effects of Cadmium**
  - The International Agency for Research on Cancer (IARC) of the World Health Organization considered that
    - sufficient evidence of carcinogenicity of cadmium and cadmium compounds in humans due to **occupational exposure through inhalation**, and classified them as “carcinogenic to human” (Group 1 agents)
  - However, available evidence suggests that cadmium does not appear to have significant genotoxic and carcinogenic potential via the oral route

Safety reference value of cadmium

- The Joint Food and Agriculture Organization/World Health Organization Expert Committee on Food Additives (JECFA)
  - established a provisional tolerable monthly intake (PTMI) of **25 mcg/kg bw** to cadmium in 2010

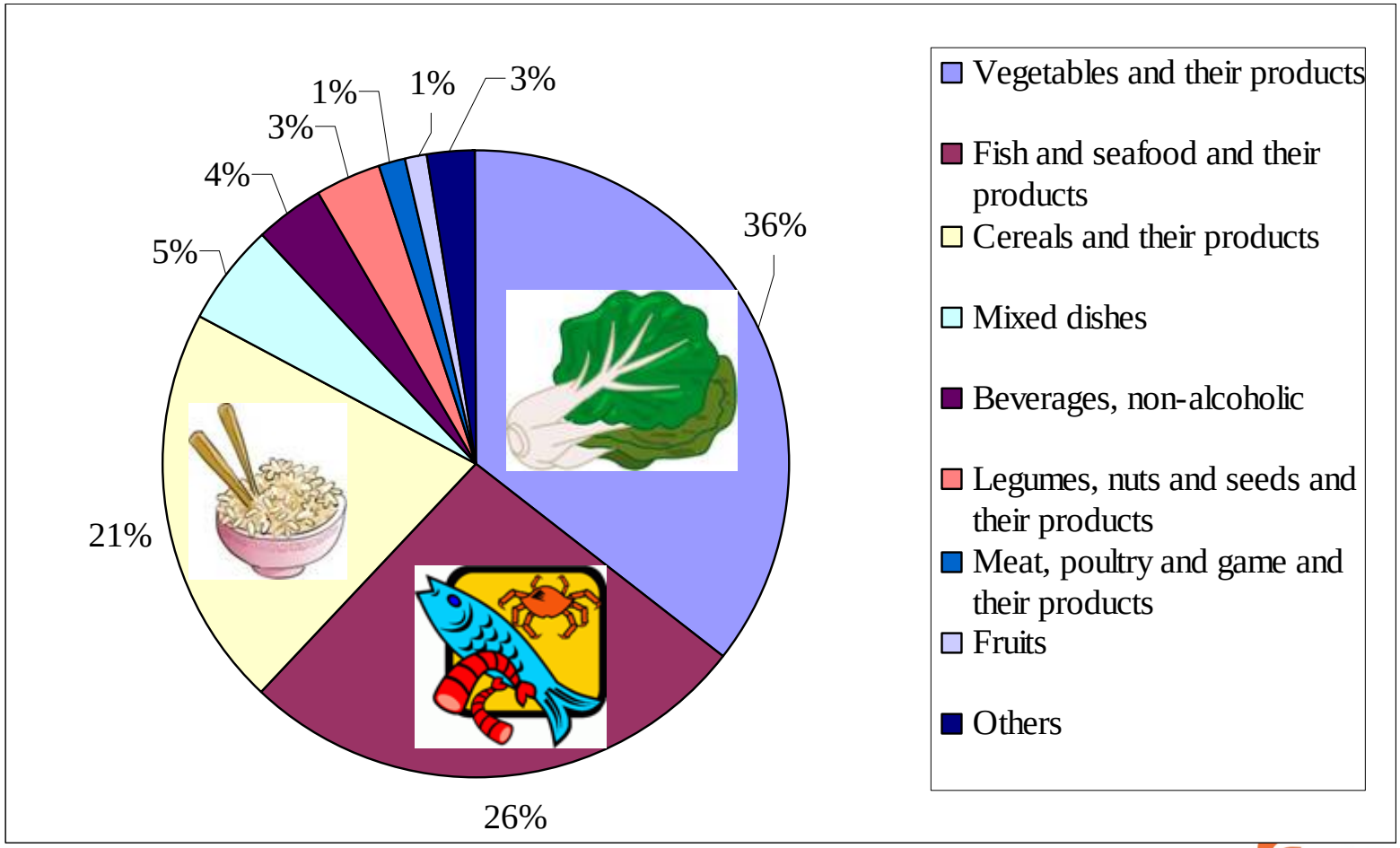
Dietary exposure to cadmium

- A risk assessment on dietary exposure to cadmium using the total diet study (TDS) methodology was conducted

- The results indicated that the general population was unlikely to experience major undesirable health effects of cadmium from dietary exposure

http://www.cfs.gov.hk/english/programme/programme_firm/programme_tds_1st_HKTDS_report5_Metallic_Contaminants.html

Dietary exposure to cadmium



Regulatory Standards of Cadmium in Rice

- Mainland China and the European Union have set standards for cadmium in rice at 0.2 mg/kg.

- In Hong Kong, the Food Adulteration (Metallic Contamination) Regulations Cap. 132 V
  - the maximum permitted concentration for cadmium in cereals is at 0.1 mg/kg.

Advice to trade

- Observe Good Agricultural Practice to minimise cadmium contamination in food crops
- Obtain food supplies from reliable sources
- Ensure foods imported or for sale are fit for human consumption and comply with legal standards

End