Risk Assessment Support for Food Incident Management

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  - **Bonsoy soy milk with very high levels of iodine**
  - **Risk assessment support on melamine incident**

Risk Assessment

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Risk Assessment (2)

- **Provide scientific support to risk managers for formulating risk management options and making risk management decisions**

  4 steps

  - **Hazard identification**
  - **Hazard characterisation**
  - **Exposure assessment**
  - **Risk characterisation**

Risk Assessment (3)

- **Risk Assessment Team**
  - **Consultant**
  - **Senior Medical and Health Officers**
  - **Food Safety Officers**
  - **Scientific Officers**

Multi-discipline subject officers

- **Contaminant**
- **Food Additive**
- **Microbiology**
- **Pesticide Residue**
- **Veterinary Drug**
- **Biotechnology**
- **Chemical**
- **Nutrition**

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Food Incident Monitoring

- **Hong Kong has a world of exquisite, mouth-watering dining options**
- **Over 90% of our food are imported**
- **HK received food produce from all over the world**
- **Mainland China as the major source**

Big challenge on monitoring of food incidents worldwide

Figures for 2006, in tonnes

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Food Incident Monitoring (2)

- **Effective food incident management demands timely responses**
- **Close monitoring of food incidents occurred locally and overseas is vital**

Purpose

- ***Identify food incidents occurred locally or overseas***
- ***Timely assess the local impact of the food incidents, if any***
- ***Provide timely response to minimise the adverse impact on public health***

1. Identify Local/Overseas Food Incidents

- **Screening for food incidents from a defined list of internet websites**
  - ***Food Safety Authorities (33 websites)***
  - ***Local and overseas media agencies (5 websites)***
  - ***Other non-government organisations (2 websites)***

Food Safety Authorities (Examples)

USA	
Food and Drug Administration (FDA)	**http://www.accessdata.fda.gov/news/** **http://www.cfsan.fda.gov/~news/whatsnew.html**
Food Safety Inspection Service of USDA	**http://www.fsis.usda.gov/News_&_Events/index.asp** **http://www.fsis.usda.gov/Fsis_Recalls/Open_Federal_Cases/index.asp**
Canada	
Canadian Food Inspection Agency (CFIA)	**http://www.inspection.gc.ca/english/whatsnewe.shtml**
European Union	
European Commission	**http://europa.eu.int/comm/food/dyna/press_rel/press_rel_ff_en.cfm** **http://europa.eu/press_room/press_releases/index_en.htm**
United Kingdom/ Ireland	
Food Standards Agency	http://www.foodstandards.gov.uk/ **http://www.food.gov.uk/news/** http://www.foodstandards.gov.uk/enforcement/alerts/
Food Safety Authority of Ireland	http://www.fsai.ie/news_centre.html http://www.fsai.ie/news_centre/food_alerts.html http://www.fsai.ie/news_centre/allergen_alerts.html

2. Summarise the Food Incidents

- **Preparing summary report on food incidents**
  - ***Summary of the incident***
  - ***Sources of information***
  - ***Details of the affected product***
  - ***Distribution of the affected products***
  - ***Hazards involved***
  - ***Local and international regulations***

3. Conduct Preliminary Risk Assessment

Hazard Identification and Characterisation

- ***Nature (e.g. chemical, microbiological etc.)***
- ***Application (e.g. food additive , pesticides etc.)***
- ***Health effects***
  - **Acute toxicity**
  - **Chronic toxicity**
  - **Genotoxicity and carcinogenicity**
  - **Safety reference values**

JECFA, JMPR, IARC, IPCS, national food safety authorities etc.

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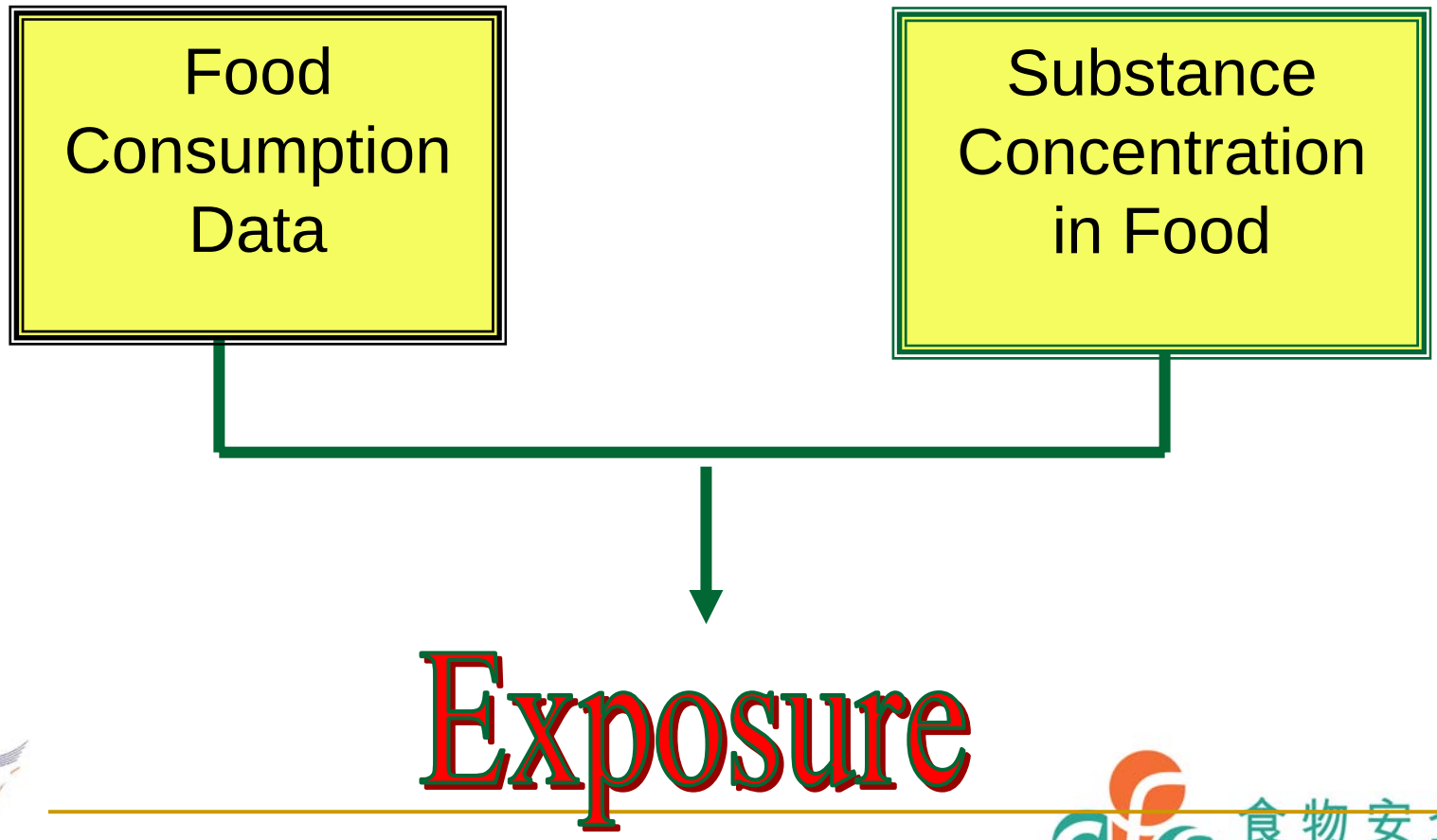
3. Conduct Preliminary Risk Assessment

Exposure Assessment



3. Conduct Preliminary Risk Assessment

Food Consumption Data

- **Hong Kong Population-Based Food Consumption Survey (FCS 2005-2007)**
  - **Surveyed 5008 Hong Kong people aged 20 - 84**
  - **Two non-consecutive days of 24-hour dietary intake records (24-hr recall)**
    - **Over 1400 different food items**

3. Conduct Preliminary Risk Assessment

Exposure Assessment & Risk Characterisation

- **Estimate dietary exposure**

  → **Substance Level X Food Consumption Amount**

  - **Average & high consumers of the HK population**
  - **Various population subgroups, if appropriate**

- **Assess the associated health risk**

  - **Compare the exposure estimated with the relevant safety reference values**

4. Disseminate Food Incident Report

- **Disseminate food incident surveillance reports timely to relevant officers in Risk Management and Risk Communication Teams for follow-up actions and formulation of risk management options**

Follow-up Actions

- **Formulate any risk management and risk communication measures**
- **Conduct detailed risk assessment for major food incidents**
  - ***Preparing technical brief:***
    - ***Background information***
    - ***Occurrence of the hazardous substance***
    - ***Detailed toxicological information***
    - ***Safety reference values***
    - ***Local situation***
    - ***Local and international regulations***

Example of Food Incident Monitoring :

Bonsoy soy milk with very high levels of iodine

Bonsoy Soy Milk with High Iodine Levels

- **Identified on 24 Dec 2009**
- **Source: Food Standards Australia New Zealand (FSANZ)**

***Hazard Identification*:**

- **Iodine in Bonsoy soy milk: about 31,250 µg/L**
  - **Soy milk enriched with "Kombu" (a seaweed product)**
  - **A cup (240 ml) contributes >7,500 µg iodine**

Bonsoy Soy Milk with High Iodine Levels (2)

Hazard Characterisation: Iodine (from WHO/FAO)

- **An essential micronutrient required for thyroid hormones synthesis**
  - **Inadequate intake**

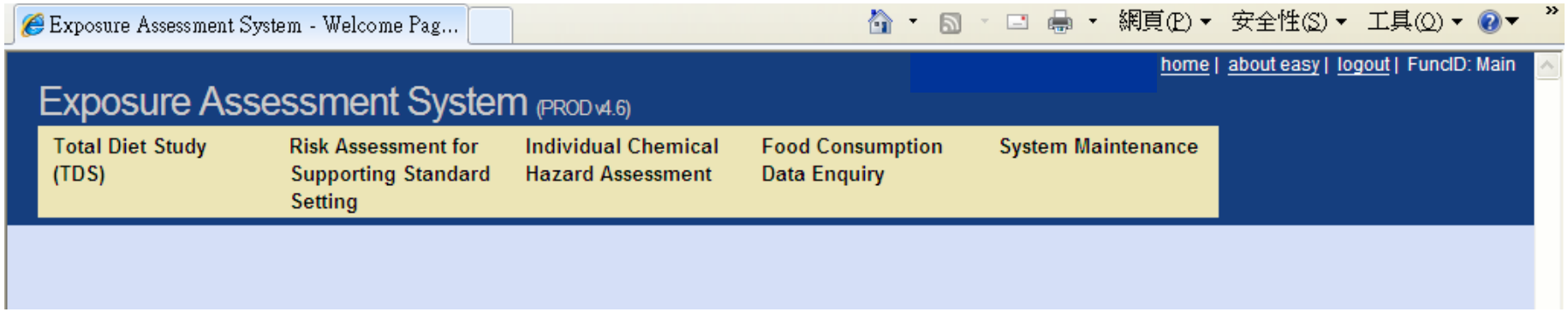
    → Iodine Deficiency Disorders (IDD)
  - **Excessive intake**

    → May cause adverse effects to the thyroid gland
- **Safety reference value**
  - **WHO/FAO recommends an Upper Limit (UL) of 30 µg/kg bw/day for dietary intake of iodine for adults**

Bonsoy Soy Milk with High Iodine Levels (3)

Exposure Assessment:

- **Estimate exposure with the aid of an in-house developed web-based computer system called "EASY" (Exposure Assessment System)**



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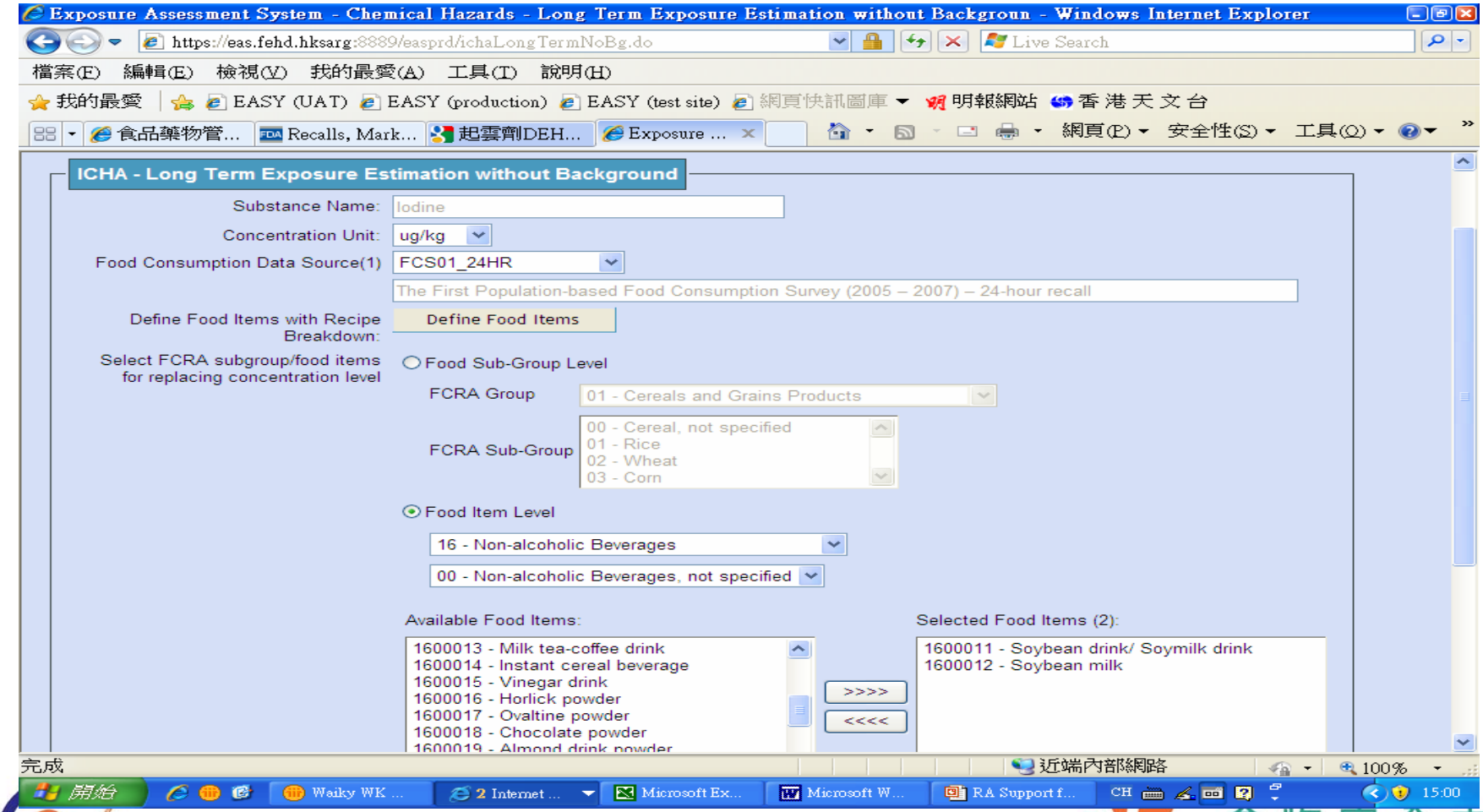
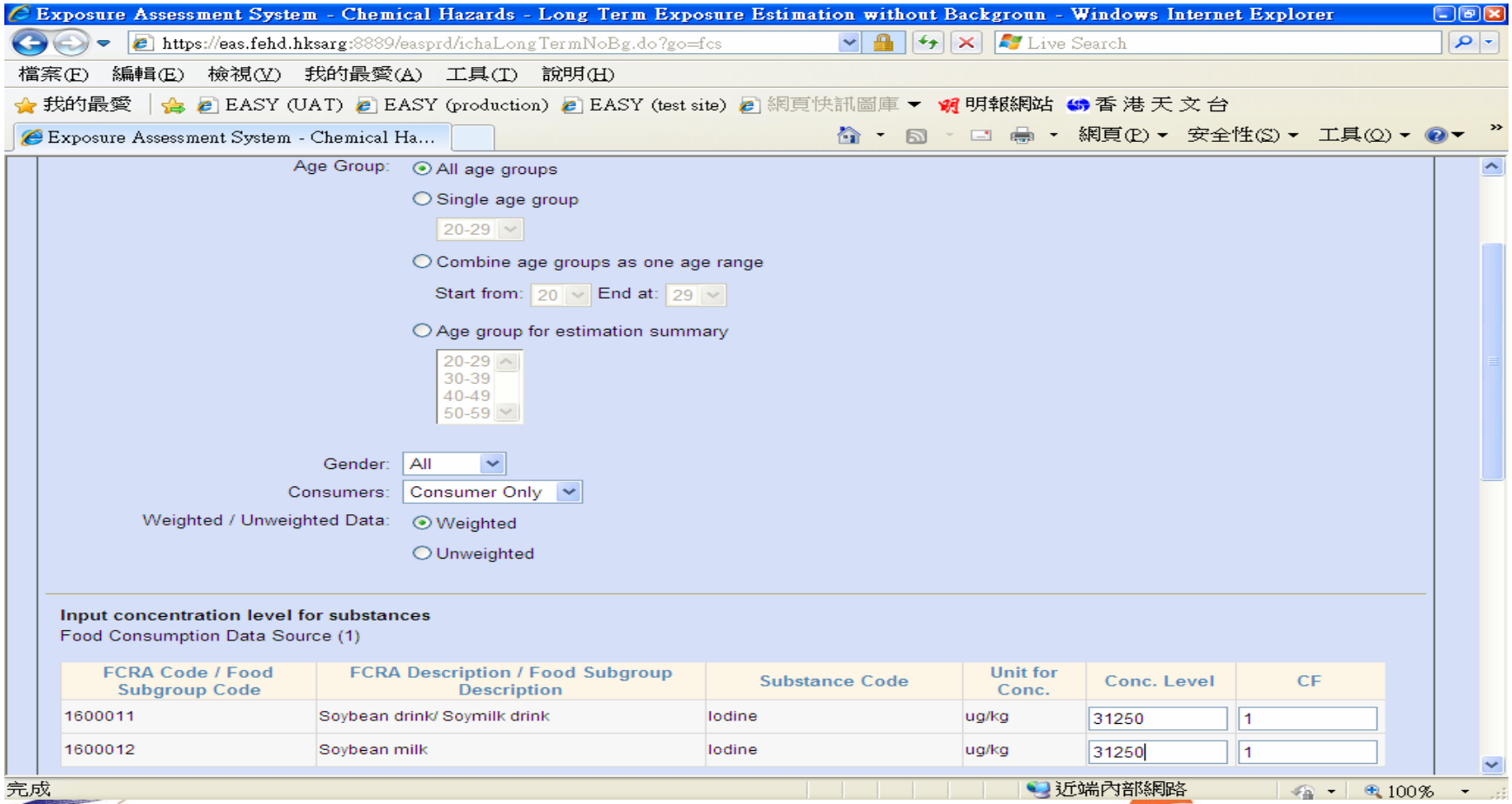
Individual Chemical Hazard Assessment Module



Individual Chemical Hazard Assessment Module (2)



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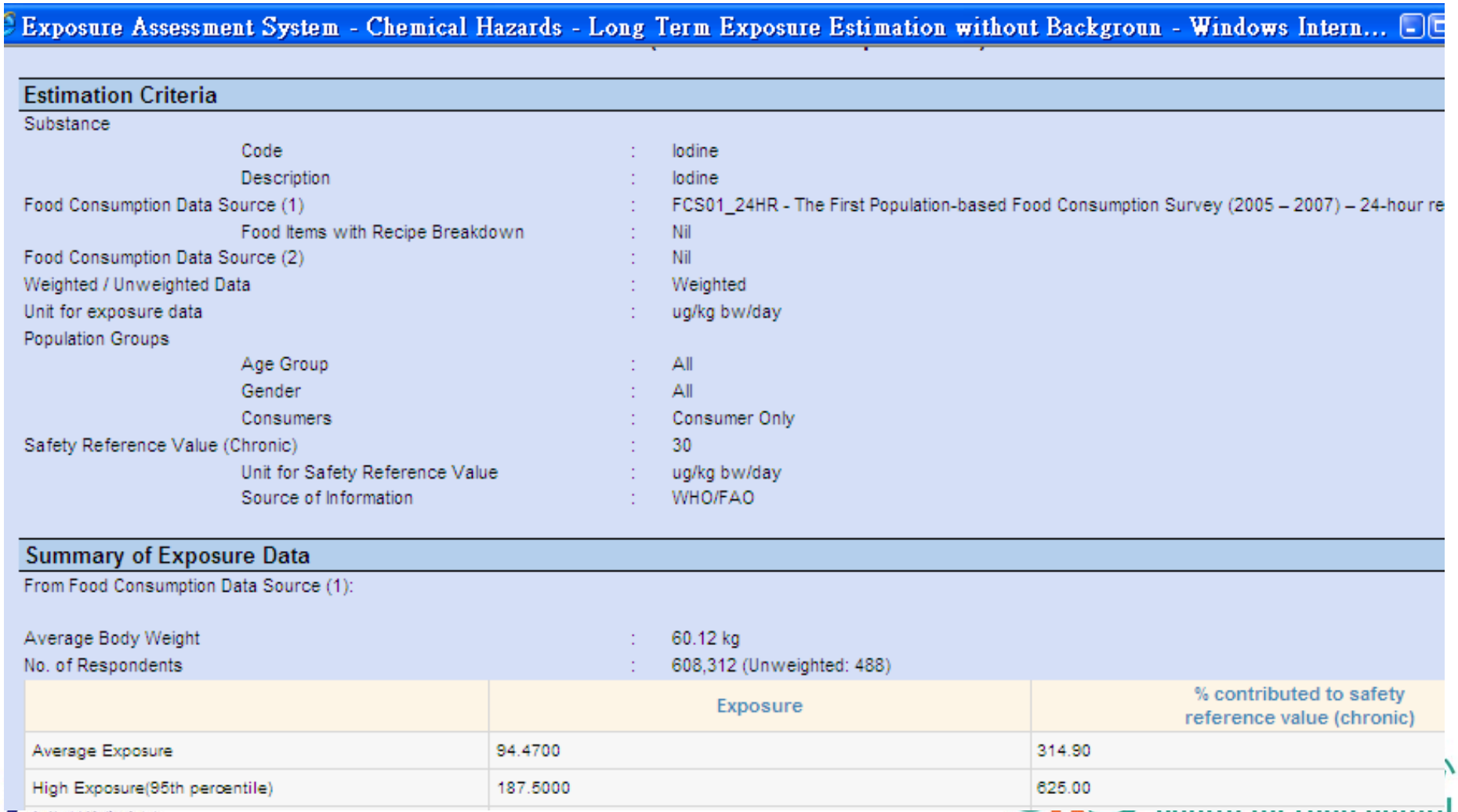
Individual Chemical Hazard Assessment Module (3)



Exposure Assessment System - Chemical Hazards - Long Term Exposure Estimation without Backgroun - Windows Intern...

Estimation Criteria

Substance		
Code	:	Iodine
Description	:	Iodine
Food Consumption Data Source (1)	:	FCS01_24HR - The First Population-based Food Consumption Survey (2005 – 2007) – 24-hour re
Food Items with Recipe Breakdown	:	Nil
Food Consumption Data Source (2)	:	Nil
Weighted / Unweighted Data	:	Weighted
Unit for exposure data	:	ug/kg bw/day
Population Groups		
Age Group	:	All
Gender	:	All
Consumers	:	Consumer Only
Safety Reference Value (Chronic)	:	30
Unit for Safety Reference Value	:	ug/kg bw/day
Source of Information	:	WHO/FAO

Summary of Exposure Data

From Food Consumption Data Source (1):

Average Body Weight	:	60.12 kg
No. of Respondents	:	608,312 (Unweighted: 488)

	Exposure	% contributed to safety reference value (chronic)
Average Exposure	94.4700	314.90
High Exposure(95th percentile)	187.5000	625.00

Bonsoy Soy Milk with High Iodine Levels (4)

Exposure Assessment:

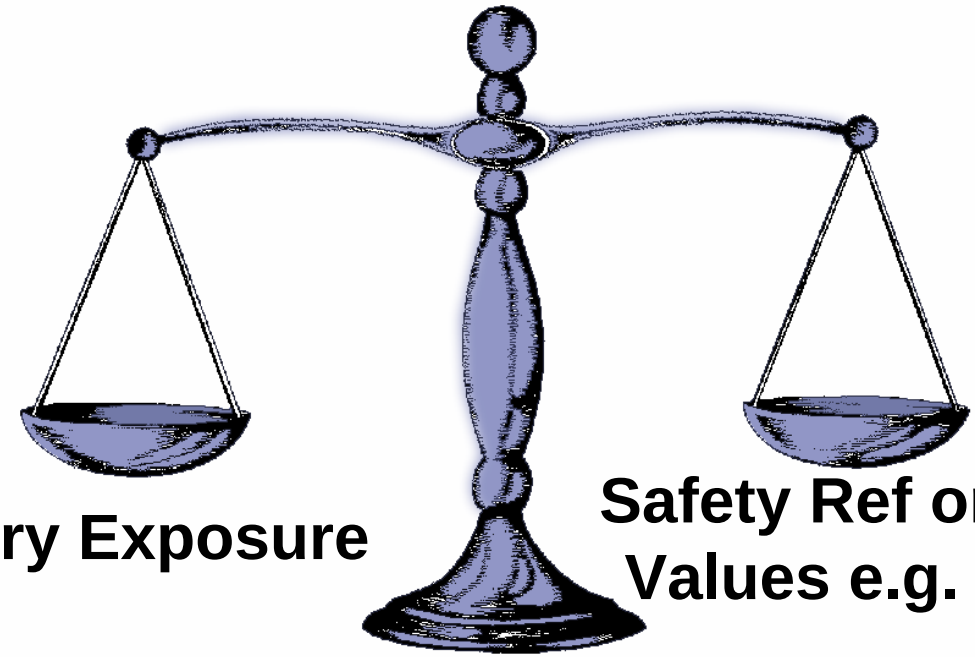
Soy milk

- **Local consumption data:**
  (including soybean milk and soybean drink/soymilk drink)
  - **Average consumers: *3.02 g/kg bw/day***
  - **High consumers: *6.00 g/kg bw/day***
- **Estimate dietary exposure:**
  → Substance Level (31,250 µg/L) X Food Consumption Amount
  - **Average consumers: 94.5 µg/kg bw/day**
    - **3.1 times of UL**
  - **High consumers: 187.5 µg/kg bw/day**
    - **6.3 times of UL**

Bonsoy Soy Milk with High Iodine Levels (5)

Risk Characterisation:

Cannot rule out adverse effects due to consumption of *Bonsoy soy milk* with 31,250 µg/L of iodine for average and high consumers



Dietary Exposure

Safety Ref or Nutritional Ref Values e.g. ADI, PTWI, RNI

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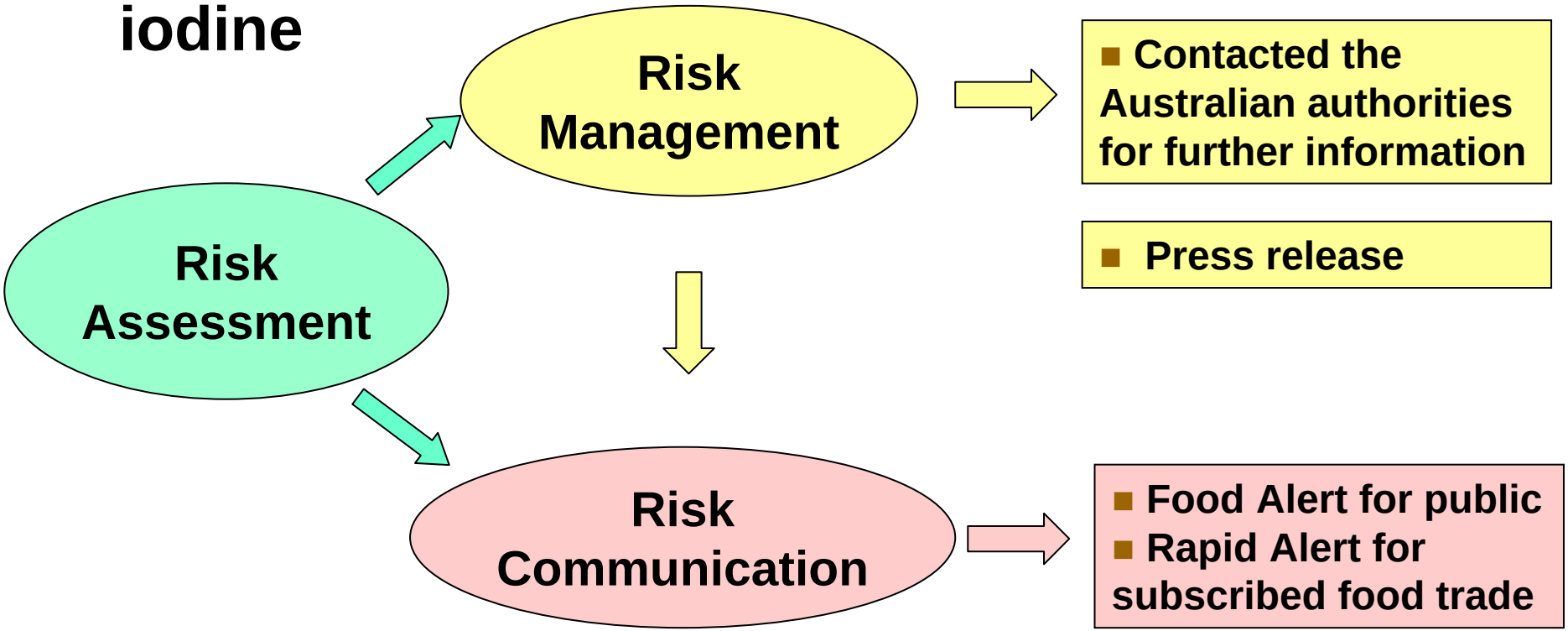
Bonsoy Soy Milk with High Iodine Levels (6)

Follow-up Actions:

- **Bonsoy soy milk with very high levels of iodine**



Alert on Soy Milk Product with High Levels of Iodine

Issue Date	24 December 2009
Source of Information	Food Standards Australia New Zealand (FSANZ)
Food Product	Soy Milk
Name of Product	Bonsoy Soy Milk
Name of Company	Spiral Foods Pty Ltd
Product Description	Product Volume: 1 Litre Best before: all dates up to and including 3.11.2011 
Reason for Recall	The product may contain unusually high levels of iodine.
Action Taken by the Centre for Food Safety	The Centre for Food Safety (CFS) has contacted the Australian authorities for further information. The CFS has learnt that the concerned product has been imported into Hong Kong and also alerted the trade to stop selling the affected product and is monitoring the situation.
Advice to the Trade	Stop selling the affected products.
Advice to Consumers	Stop consuming the affected products. Seek medical advice if doubt.
Further Information	Website of Food Standards Australia New Zealand (FSANZ) The CFS press release

Example of Food Incident Monitoring :

RA Support in Melamine Incident

Melamine in Milk Incident in China

- **Identified through food incident monitoring in Sept 2008**
  - **Cases of renal stone in infants in mainland China**
  - **Infant formula products were contaminated with melamine**
  - **Melamine was added to milk to cause a false increase in the measurement of protein for dairy products**

Risk Assessment

Hazard Identification:

- **An industrial chemical**
- **Infant formula contained especially high level of melamine (up to 2563 mg/kg) in the Mainland**
- **Also found in other milk and animal products (e.g. ice pops, chocolates, eggs, etc) in local market**

Risk Assessment (2)

Hazard Characterisation:

- **Not metabolised and rapidly eliminated via urine**
- **Low acute toxicity**
- **Give rise to stone problem**
- **Not carcinogenic, genotoxic, or teratogenic**
- **NOAEL: 63 mg/kg bw/day**
- **Temporary safety reference doses for adult and young children**
  - **0.63 mg/kg bw/day for adult**
  - **0.32 mg/kg bw/day for children under three**

Risk Assessment (3)

Exposure Assessment & Risk Characterisation

- **Used two sets of limits as examples for exposure assessment as the susceptibility to melamine differs between young children and adults**
  - **A 10kg three-year-old child**
  - **A 60 kg adult**
- **Reach safety reference with following daily consumption of melamine:**
  - **37.8 mg for adult**
  - **3.2 mg for children**
- **Provided scientific basis to regulate melamine in food**

Regulation of Melamine in Food

- **"Zero Tolerance" is not applicable**
  - **Other sources of melamine and its analogues:**
    - **Migration into food from melamine-ware**
    - **A metabolite of pesticide cyromazine in plants and animals**
    - **Addition of cyanuric acid as a byproduct in feed grade biuret**
    - **Chlorine disinfectants in food production & processing**

"Harmful Substances in Food Regulation"

- **Amendment Regulation came into operation on 23 Sept 2008**
- **Set maximum melamine concentrations:**
  1) **Milk: 1 mg/kg**
  2) **Any food intended to be consumed principally by children under 36 months and any food intended to be consumed principally by pregnant or lactating women : 1 mg/kg**
  3) **Any other food: 2.5 mg/kg**
- **Other food authorities also adopted similar limits for melamine**
- **WHO in Dec 2008**
  - **Established the Tolerable Daily Intake (TDI) of 0.2 mg/kg bw/day**
  - **Opined that such melamine limits provide a sufficient margin of safety for dietary exposure relative to the TDI**

Determining Factors of Food Incident Monitoring

- **Monitoring and reporting timely**
- **Accuracy of the source of information**
- **Development of database on food hazards**
  - **Technical information provided by different subject officers in risk assessment team**

Conclusion

- **Effective food incident management demands timely responses**
- **Close monitoring of food incidents occurred locally and overseas is vital**


- Thank You -