Food Safety Risk Assessment in Hong Kong

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Presentation Outline

- Food Safety Risk Assessment
  - Approach
  - Risk Assessment Section
  - Food Incidents Monitoring
- Use of risk assessment results
  - Support risk management and communication
  - Formulate of food safety standards
  - Devise food safety information to public

Risk Assessment (1)

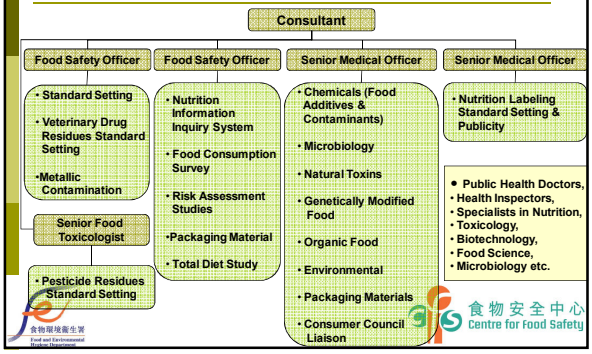
- Forms the scientific basis of risk management and communication
- Four components :
  - Hazard identification
  - Hazard characterisation
  - Exposure assessment
  - Risk characterisation

Risk Assessment (2)

Through risk assessment processes:

- Hazards associated with food or food ingredients are evaluated
- Potential risk to the population is assessed
- Formulation of appropriate risk management actions and risk communication messages to protect public health

Risk Assessment Section Centre for Food Safety of Food & Environmental Hygiene Department



Food Incidents Monitoring

Food Incidents Monitoring (1)

- Free port
- Little local food production
- Over 95% of food consumed is imported
- Large volume and variety of food from around the world

Big challenge to monitor food incidents occur worldwide

Figures for 2006, in tonnes

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Food Incidents 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
  - Assess local impact, if any
  - Provide timely response to minimise adverse impact on public health

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Food Incidents Identification

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

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Summary of Food Incidents

- Prepare summary report:
  - Incident summary
  - Sources of information
  - Details of the affected product
  - Distribution of the affected products
  - Hazards involved
  - Local and international regulations

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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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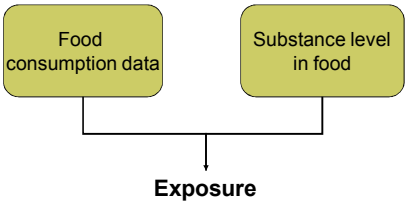
Exposure Assessment



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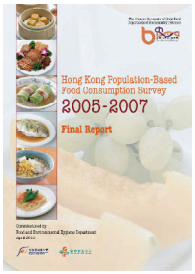
Food Consumption Survey

- To collect population-base food consumption information
  - e.g. type and amount of food consumed
- Provide data for risk assessment and dietary assessment–
  - allow quantitative evaluation of the population's exposure to the hazard concerned via consumption of the food involved
  - nutrient intake of the population could be estimated in combination with food composition data

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



Exposure Assessment

- Estimate dietary exposure
  - Substance Level X Food Consumption Amount
  - Average & high consumers of Hong Kong population
  - Various population subgroups, if appropriate
- Assess the associated health risk
  - Compare the exposure estimated with the relevant safety reference values

Disseminate Food Incident Report

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

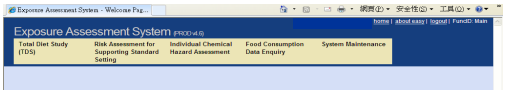
An Example How to Make Use of Risk Assessment Result

Plasticiser Incident in Taiwan

- Identified through food incidents monitoring on 24 May 2011
- Phthalates were found to be added intentionally to foods
  - Industrial chemicals used as plasticiser to improve flexibility and durability of plastic materials
  - Common phthalates include DEHP, DINP, DIDP, DBP, etc.
- Phthalates in food was not covered in routine food surveillance programme
- No specific regulation governing the level of phthalates in food

DEHP Exposure Assessment

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



- TDI will be reached if a 60 kg adult intake of 1.5 mg DEHP a day
- Provided scientific basis to set DEHP limit in food

Action level of DEHP

- DEHP
  - Adopted EU's deterministic model by assuming that a person consumes daily 1 kg of packaged food
  - If a maximum limit of 1.5 mg/kg for DEHP in food is set, the exposure to DEHP of a 60-kg adult will be 0.025 mg/kg bw/day
  - The WHO's TDI (0.025 mg/kg bw) would not be exceeded

Action Levels of Other Phthalates

- DINP& DBP
  - No TDI established by WHO or JECFA
  - Reference made to TDIs of European Food Safety Authority (EFSA)
  - Similar approach to DEHP
- Action levels in food
  - 9 mg/kg for DINP/DIDP (as the sum of the substances)
  - 0.3 mg/kg for DBP

Support to Risk Management

- Advice on action levels
  - Based on TDI from international and national authorities
  - Seek endorsement from Expert Committee on Food Safety
- Technical briefs on different phthalates
  - Health information and regulatory control
- Conduct risk assessment on non-compliant products of daily surveillance

Form Basis of Standard Setting

Local Food Standard Setting

- Regular review on food standards
  - To protect public health and keep the local food standards in line with International development (e.g. Codex) and advancement of food science and technology
- Factors to be considered in review
  - Public health concern
  - Local food standards
  - International standards
  - Stakeholder concern

RA in Standard Setting

- Scientifically assess the dietary exposure to the hazard of concern and possible adverse health effects on the local community, taking local food consumption into consideration
- Local standards set without compromising public health

Food Standard Exercises under Review

- Pesticide Residues
- Veterinary Drug Residues
- Natural Toxins (Shellfish toxins and mycotoxins)
- Heavy Metals in food
- Microbiological Guidelines for Ready-to-eat food

Pesticide Residues in Food

- **Proposed Approach**
  - Proposed two-step approach to set the standards for Hong Kong
- **First step**
  - Proposed to adopt the standards of individual pesticides recommended by Codex as the backbone
  - Supplemented by related standards of the Mainland and other major exporting countries, notably Thailand and the USA
- **Second step**
  - Evaluate the proposed standards by conducting risk assessment
  - Assess adequacy to protect public health in the local setting

Provide Food Safety Information to Public

RA Study -- Mercury in Fish and Food Safety (2008)

- Study objectives
  - To examine the total mercury (tHg) and methylmercury (MeHg) levels in fish commonly consumed in Hong Kong
  - To estimate the dietary MeHg intake
- tHg, MeHg and fatty acids levels in fish
  - Covered 89 fish species (whole fish for species identification), each with 3 samples unless otherwise stated
  - Analysed as sold

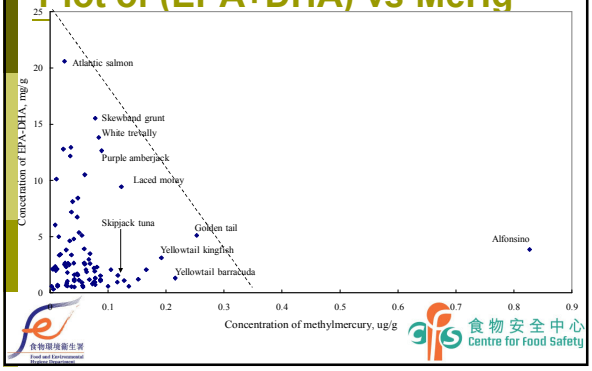
Dietary MeHg Intake Estimation

- Consumption data
  - From the Food Consumption Survey conducted in 2000
- Summation
  - Amount of fish consumed x Median MeHg content in fish
- Results
  - an average secondary student intake MeHg of 0.50 (lower bound) to 0.66 (upper bound) μg/kg bw/week (31 to 41% of PTWI of 1.6 μg/kg bw/week)
  - High consumers intake 1.51 to 1.69 μg/kg bw/week

Risk Benefit of Fish Intake

- Main source of long chain omega-3 fatty acids, especially EPA and DHA
- Cannot obtain from edible plant oils
- Selection of fish with healthier choices
  - Fish contain comparatively high level of long chain omega-3 fatty acids
  - Fish contain relatively low level of MeHg

Plot of (EPA+DHA) vs MeHg



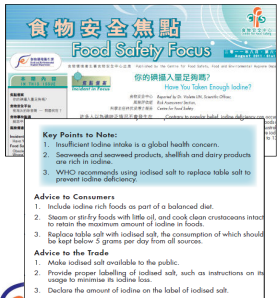
RA Study -- Dietary Iodine Intake in Hong Kong Adults (2011)

- Study objectives
  - To examine the iodine levels in selected foods in Hong Kong
  - To estimate the dietary iodine intake in adults
- Iodine levels in food
  - Covered 92 food items, each with 3 samples unless otherwise stated
  - Analysed in foods as sold

Dietary Iodine Intake Estimation

- Consumption data
  - From the Hong Kong Population-based Food Consumption Survey 2005-2007
- Summation
  - Amount of food consumed x Mean iodine content in each food
- Results
  - a median iodine intake of 44 µg/day
  - 93% of the adult population with intake below WHO's recommendation

Message to Public



Other RA Studies

- Nitrate and Nitrite in Vegetables Available in Hong Kong (Jul 2010)
- Dietary Exposure to Acrylamide of Hong Kong Adult Population (Dec 2010)
- Hepatitis E Virus in Fresh Pig Livers (Dec 2010)
- Microbiological Quality of Non-prepackaged Beverages Mixed or Topped with Solid Ingredients in Hong Kong (Sep 2011)

End

Expert Committee on Food Safety

- Consists of
  - academics,
  - professionals,
  - food experts,
  - members of the trade
  - consumer group, and
  - other experts
- The current membership includes four experts from the Mainland and overseas

Terms of Reference

- To advise the Director of Food and Environmental Hygiene on
  - existing or new food safety operational strategies and measures to protect public health
  - standards/guidelines relating to food safety and food composition and their suitable adoption in Hong Kong having regard to international practices, trends and developments
  - the strategies for risk communication to promote food safety and how best to implement relevant risk communication or public education programmes
  - any new directions for any research to be commissioned by the Centre for Food Safety