

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

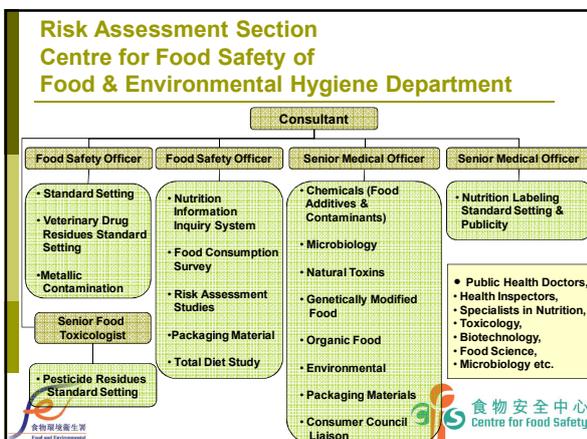



Risk Assessment (2)

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





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

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

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)

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

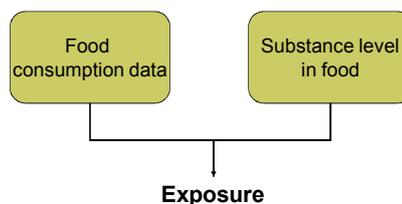
Conduct Preliminary Risk Assessment

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.

Exposure Assessment



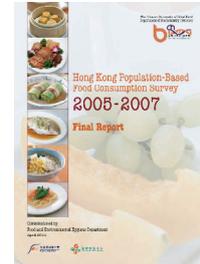
Food Consumption Survey

- 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 Chinese Taipei

- 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) $\mu\text{g}/\text{kg bw}/\text{week}$ (31 to 41% of PTWI of 1.6 $\mu\text{g}/\text{kg bw}/\text{week}$)
 - High consumers intake 1.51 to 1.69 $\mu\text{g}/\text{kg bw}/\text{week}$

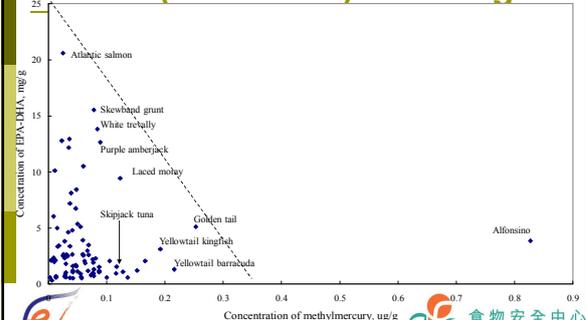


Risk Benefit of Fish Intake

- 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

Key Points to Note:

- Insufficient iodine intake is a global health concern.
- Seaweeds and seaweed products, shellfish and dairy products are rich in iodine.
- WHO recommends using iodised salt to replace table salt to prevent iodine deficiency.

Advice to Consumers:

- Include iodine rich foods as part of a balanced diet.
- Steam or stir fry foods with little oil, and cook clean crustaceans intact to retain the maximum amount of iodine in foods.
- Replace table salt with iodised salt, the consumption of which should be kept below 5 grams per day from all sources.

Advice to the Trade:

- Make iodised salt available to the public.
- Provide proper labelling of iodised salt, such as instructions on its usage to minimise its iodine loss.
- Declare the amount of iodine on the label of iodised salt.



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



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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



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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



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