

DIETARY EXPOSURE ASSESSMENT
TOOLS FOR PRIORITIZING FOOD SAFETY
CONCERNS

November 18-19, 2008

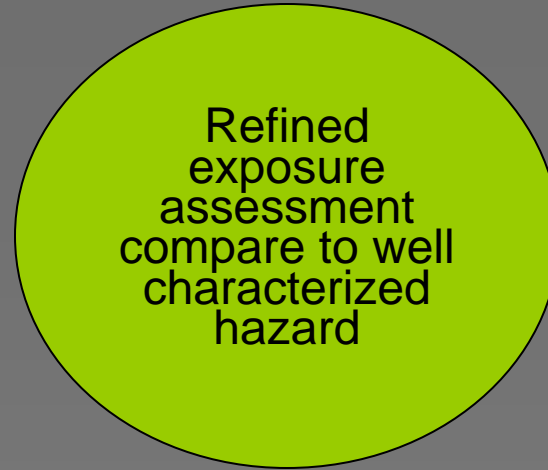
GROUP 3

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HAZARD

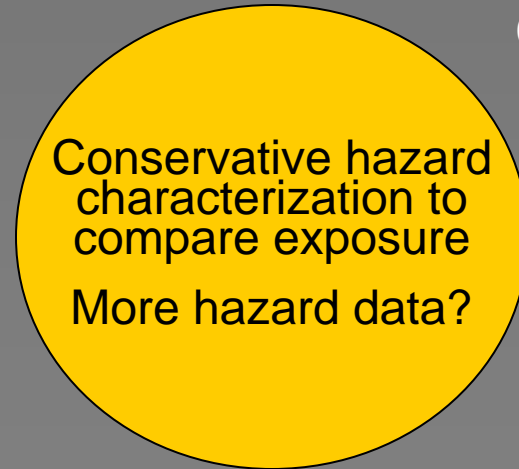
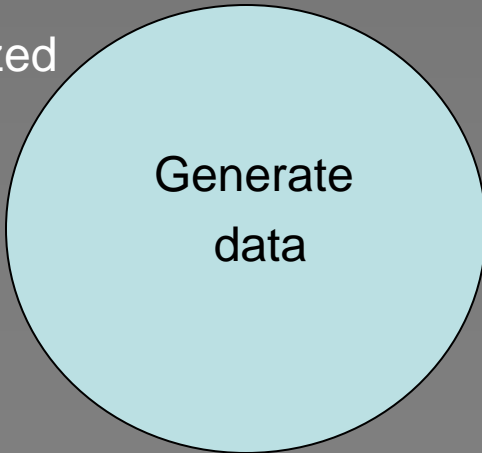
Characterized



EXPOSURE

Characterized

Not well characterized



Not well characterized

HAZARD



Acrylamide



Melamine



Mycobacterium paratuberculosis

Characterized

2005

2008

2008

DIETARY
EXPOSURE

Not well
characterized

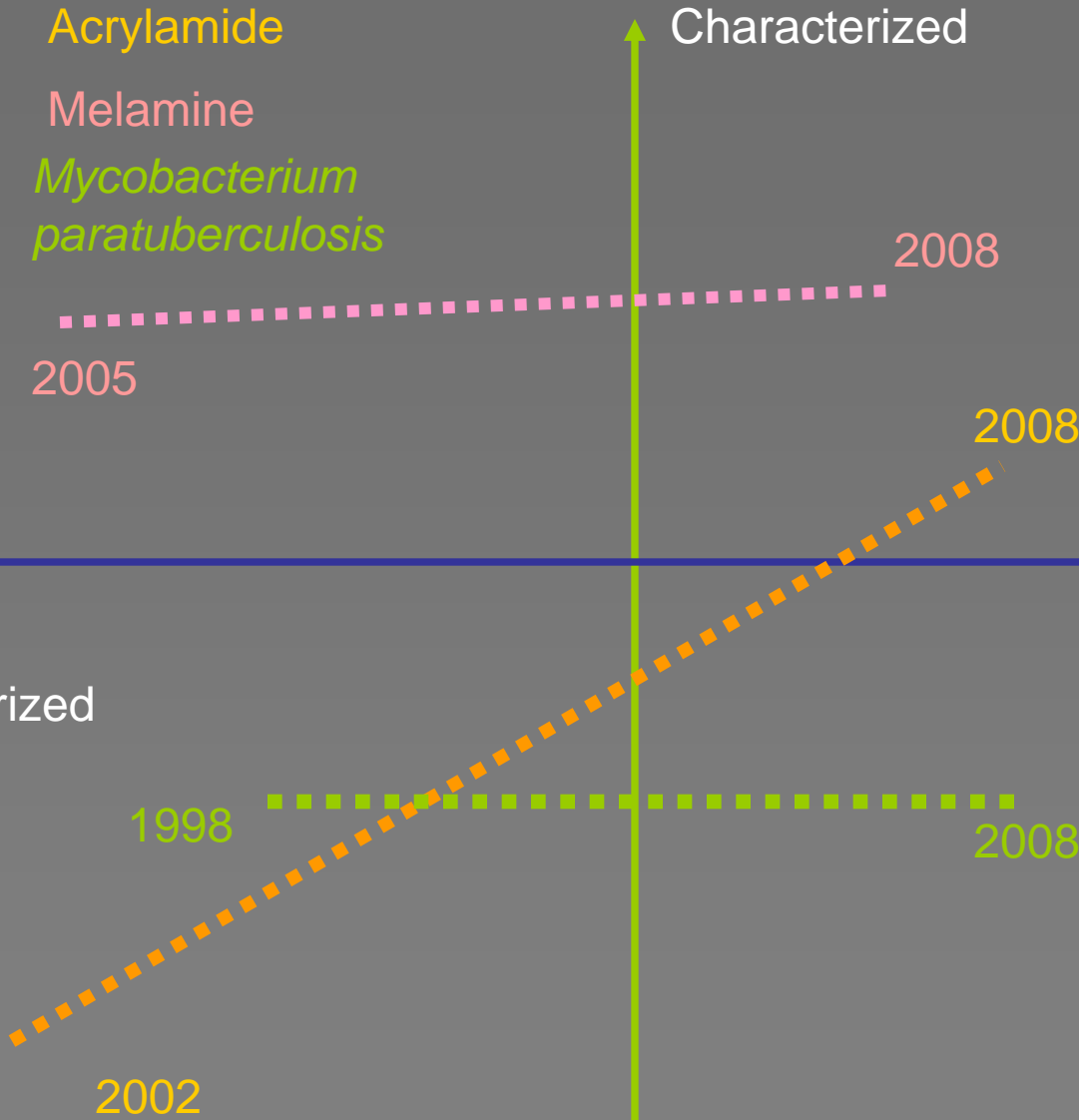
Characterized

1998

2008

2002

Not well characterized



General Principles

- Dietary exposure assessments are an integral part of risk assessments in that the level of risk to public health and safety, resulting from chemical and microbiological hazards in food, is dependent on the level of exposure.

General Principles

- That each exposure assessment would be **'fit for purpose'**. In this respect exposure assessments should be no more complex than is necessary to answer the risk assessment question.

General Principles

- In principle it is desirable to make the best estimate of dietary exposure for chemical and microbiological hazards using all the available information.

General Principles

- A step-wise approach may be used, particularly in cases where there may be limited resources. In this context the most refined accurate dietary exposure assessment, using all the available information, would only be calculated where first estimates indicate reference health standards may otherwise be exceeded.

General Principles

- Where there are significant uncertainties in the input data, conservative assumptions would normally be applied to ensure that dietary exposure is not underestimated. If conservative assumptions are applied then the level of conservatism should be clearly articulated.

General Principles

- The appropriateness of the concentration and food consumption data used in the exposure assessment should also be explained. Where no reliable concentration data are available then modelling may be appropriate (e.g. using data on the physicochemical properties to predict concentrations of a chemical hazard) while recognising the uncertainty associated with this approach.

General Principles

- Exposure assessments should take account of changes to the levels (increase or decreases) of the chemical and microbiological hazards across the food chain (farm to fork) resulting from food processing, storage and cooking. This is particularly important for microbiological hazards due to their dynamic nature.

General Principles

- Dietary exposure assessments should cover the general population as well as vulnerable population sub-group(s) that are identified in the hazard characterisation or based on the food types that contain the hazard.

General Principles

- Dietary exposure assessments for chemical hazards should take account of the duration of exposure required for the realisation of the toxicological end-point, as considered in the hazard characterisation (e.g. acute, sub-acute and chronic exposure assessments). This may also affect the population groups included in the exposure assessment.

General Principles

- The duration of exposure would not normally be a consideration for microbiological dietary exposure assessments.

General Principles

- Dietary exposure assessments should estimate the likelihood of some consumers having relatively higher levels of exposure to food chemicals than the general population and the level of exposure for these groups

General Principles

- The methodology used, data sources and assumptions made, such as the level of conservatisms and uncertainties in the dietary exposure assessment should be effectively documented and communicated to facilitate the understanding of the dietary exposure assessment outcomes and for risk characterisation, risk management and risk communication purposes.

Uncertainty associated with Consumption Data

- Four scenarios to illustrate the FIT FOR PURPOSE and how uncertainty changes with different situations
- EXAMPLES
- Considered together with the level of conservatism

Consumption Data - uncertainty

Potential Consumption Data Sources	SCENARIOS				Acute
	Contaminant in specific food product		Contaminant in range of food products		
	Broad consumption by pop.	Narrow consumption by pop.	Broad consumption by pop.	Narrow consumption by pop.	
Food frequency or targeted surveys	HIGH	LOW	HIGH	HIGH	NA
National surveys at individual level	LOW	HIGH	LOW	HIGH	LOW
Simulated diets (TDS)	LOW-MEDIUM	MEDIUM-HIGH	LOW-MEDIUM	HIGH	HIGH
Food Production Databases	MEDIUM	MEDIUM	MEDIUM	HIGH	NA

*In case of semi-quantitative FFQ assessment could be made with high uncertainty.

Consumption Data – US example

POPULATION	DATABASE
General Population	Food Production data (per capita disappearance)
	Individual national surveys (CFSII, NHANES)
Infants and Children	GEMS, Large Portion
	Individual national surveys (CFSII, 98;NHANES)
Pregnant and Lactating Women	Individual national surveys (CFSII, NHANES)
Elderly	Individual national surveys (CFSII, NHANES)
Health compromised	NHANES
Low income groups	Individual national surveys (CFSII, NHANES)

Key References for Dietary Exposure Assessment

- EFSA (2006): Opinion of the Scientific Committee related to Uncertainties in Dietary Exposure Assessment*
- FAO/WHO (2008): Principles and methods for the risk assessment of chemicals in food (Chapter 6: Dietary exposure assessment of chemical in foods)*
- Exponent[®] (under revision): Exposure assessment for ranking food safety concerns (chemical cont. focus) – a white paper
- FAO/WHO (2008): Exposure assessment of microbiological hazards in foods – guidelines*

* Available at www.FoodRisk.org

Data Gaps

- Quantitative data for microbiological exposure assessment
- Better dose-response models for susceptible population
- Information on test accuracy (Se/Sp)
- Better define susceptible populations
- Better understanding of consumer practices

Data Gaps

- Better understand how conservative parameters are chosen for different types of dietary exposure assessments
- How these choices impact the outcome