foodregsci

STARTING THE RISK ASSESSMENT APPROACH

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Review of a Risk Assessment Approach…

Reviewing the notions of Hazard and Risk

Reviewing the various approaches to achieve hazard characterization for chemicals in food

Food Safety and Standards

Food Safety is a Prerequisite to Food Availability

Food Safety is therefore a Pillar of Food Security

If Food is Not Safe it is Wasted

Robust Food Safety Decisions Based on Risk Analysis

Key Pillars of a Robust Food Control System

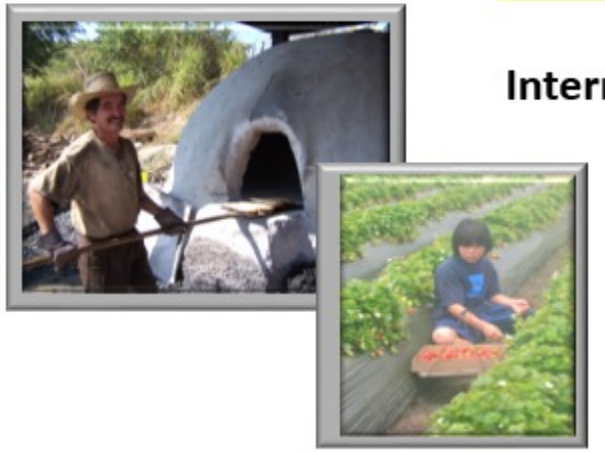
The Scientific Basis of Codex

CODEX Committees

Food and Agriculture Organization of the United Nations

World Health Organization

CODEX ALIMENTARIUS COMMISSION



International Food Safety Standards

Consumer Protection
and
Fair Food Trade Practices

Food is a Complex Mixture / Sources of Contaminants

Nutrients

- ❑ Carbohydrates, proteins, lipids, minerals, vitamins….

Non-nutrients

- ❑ Naturally occurring plant substances:
  - E.g. plant hormones, natural plant pesticides, plant anti-nutrients (e.g. chymotripsin inhibitors), plant toxins (as part of the composition of the plant)
- ❑ Substances from other origin:
  - From the environment or related to human activity (microorganisms and chemicals)
    - Environmental / Natural sources: chemicals produced during plant growth, storage or processing (fungal and algal toxins), heavy metals from the environment (Cd, Hg)
    - Human activity related chemicals:
      - Deliberate addition /use : Food additives, flavoring agents and Residues: e.g. pesticides, veterinary drugs
      - Contaminants that accumulate in the environment and enter food chain
        e.g. PCBs, heavy metals (e.g. Cd, Hg)
      - Chemicals that are due to food processing: e.g. nitrosamine, acrylamide, PAHs

Scientific Assessment / JECFA areas of Work Covers all Aspects

- Safety evaluation / Risk Assessment of :
  - Food Additives
  - Processing aids (considered as food additives)
  - Flavouring agents (by groups of related compounds)
  - Contaminants
  - Natural toxins
  - Residues of Veterinary Drugs in animal products

- Specifications and analytical methods, Residue definition, MRL proposals (veterinary drugs)
- Development and improvement of general principles
  - FAO/WHO Update on the Principles and Methods for the Risk Assessment of Chemicals in Food, EHC 240 2010; http://www.who.int/foodsafety/publications/chemical-food/en/

Key Concept: Hazard vs Risk?

Hazard

Risk

The difference is the EXPOSURE

Key Concept: Hazard vs Risk? (2)

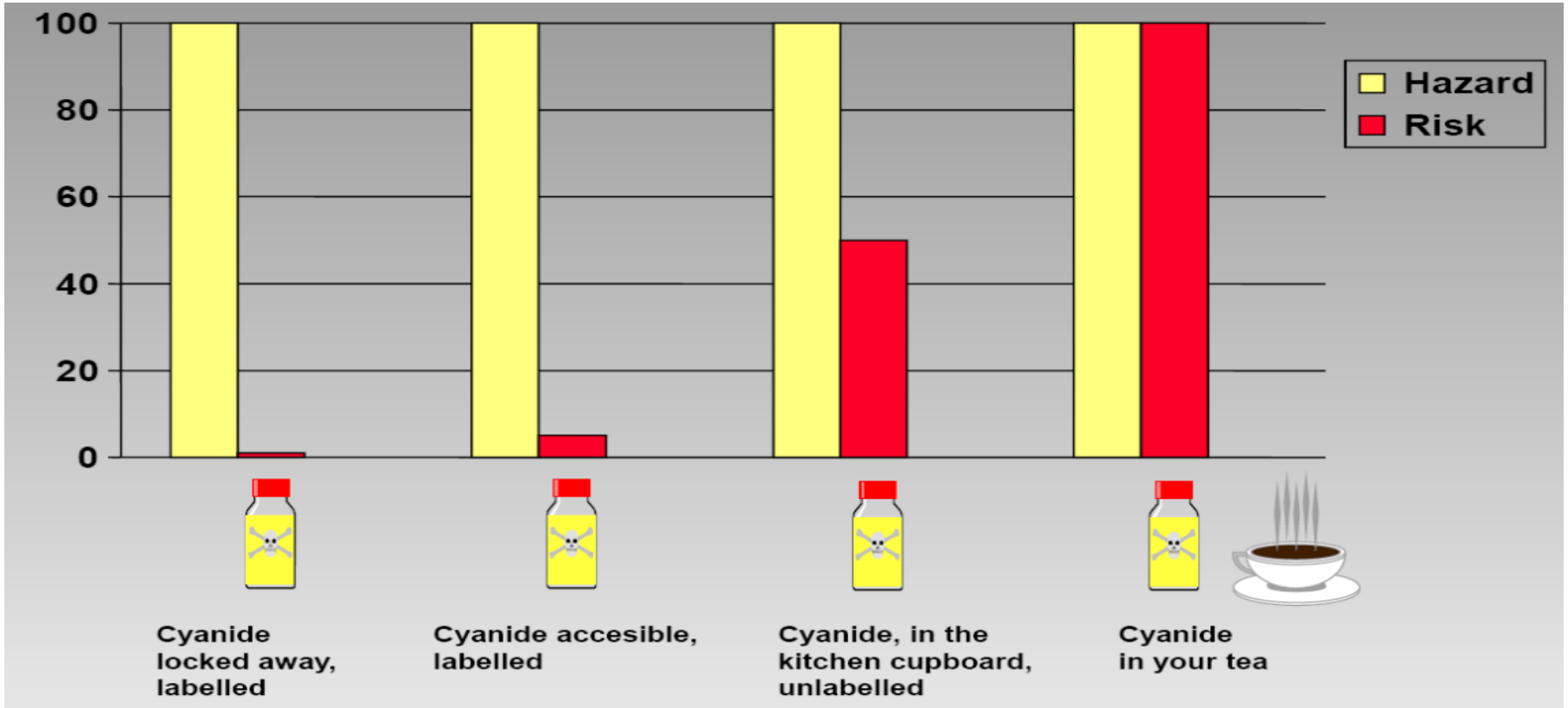
Hazard

Risk

The difference is the EXPOSURE

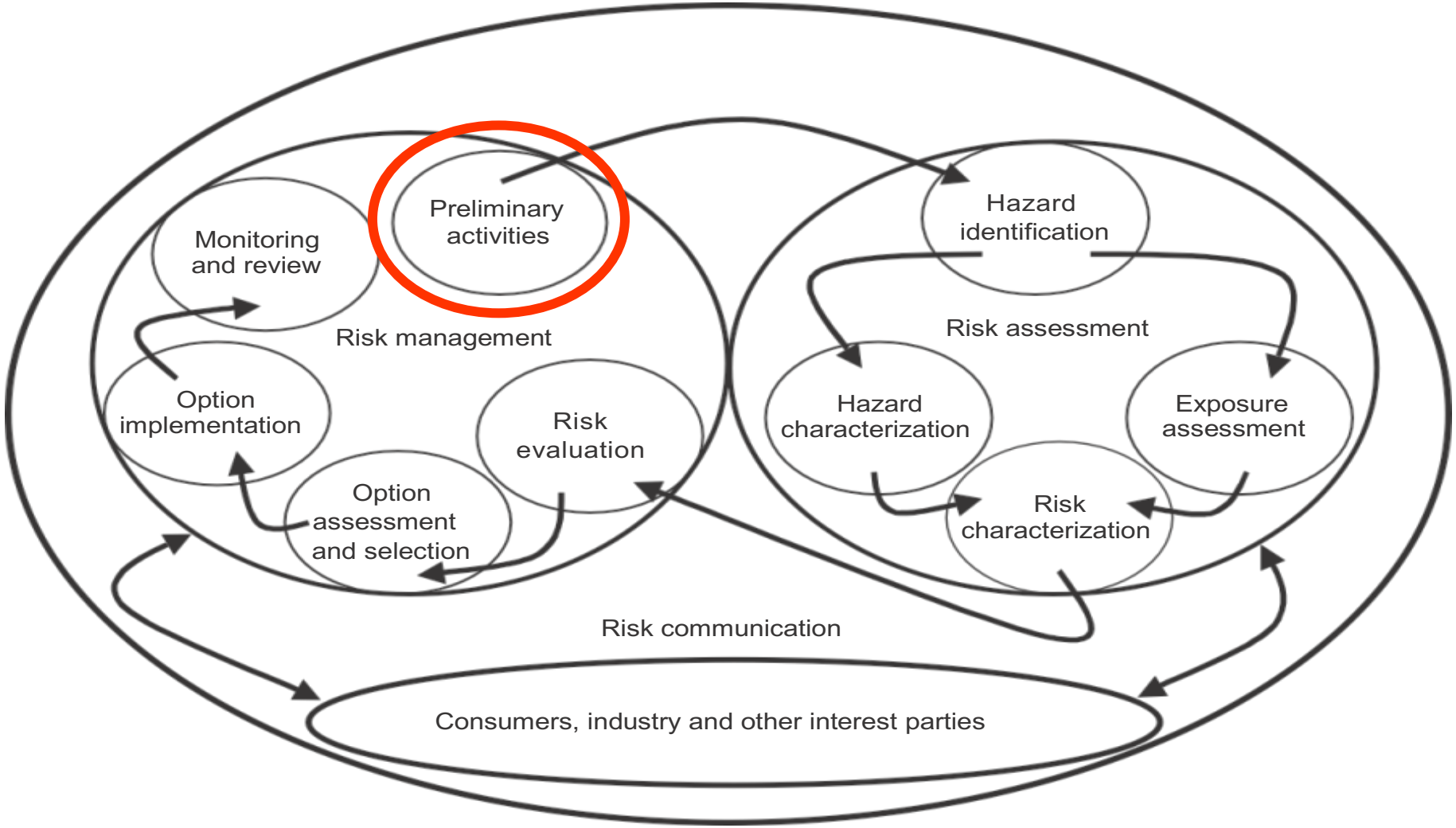
Risk = Hazard x Probability of Exposure

Hazard constant and probability of exposure is increasing

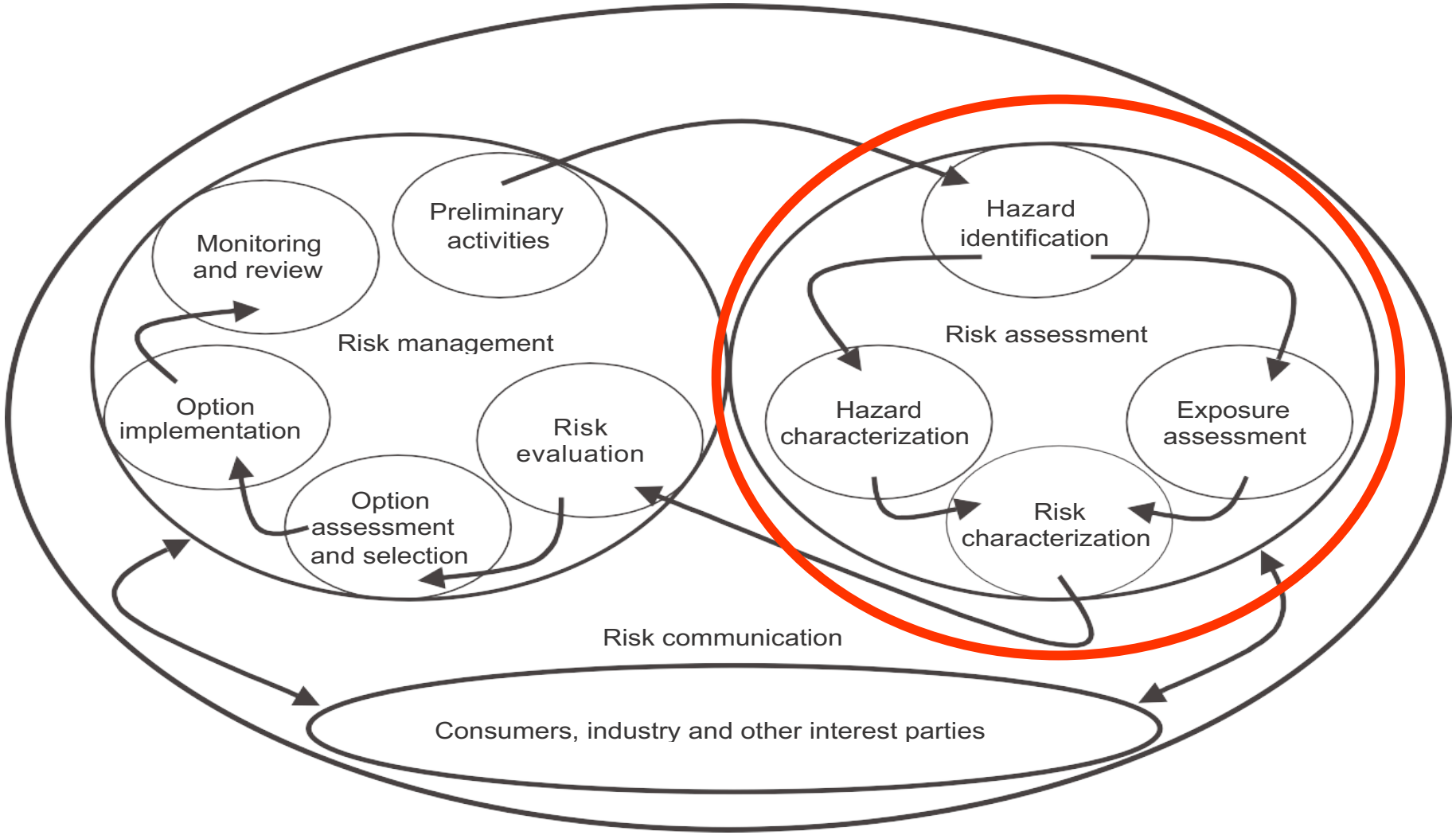


Excerpt Prof. Lemmens Slides – BOKU - Austria

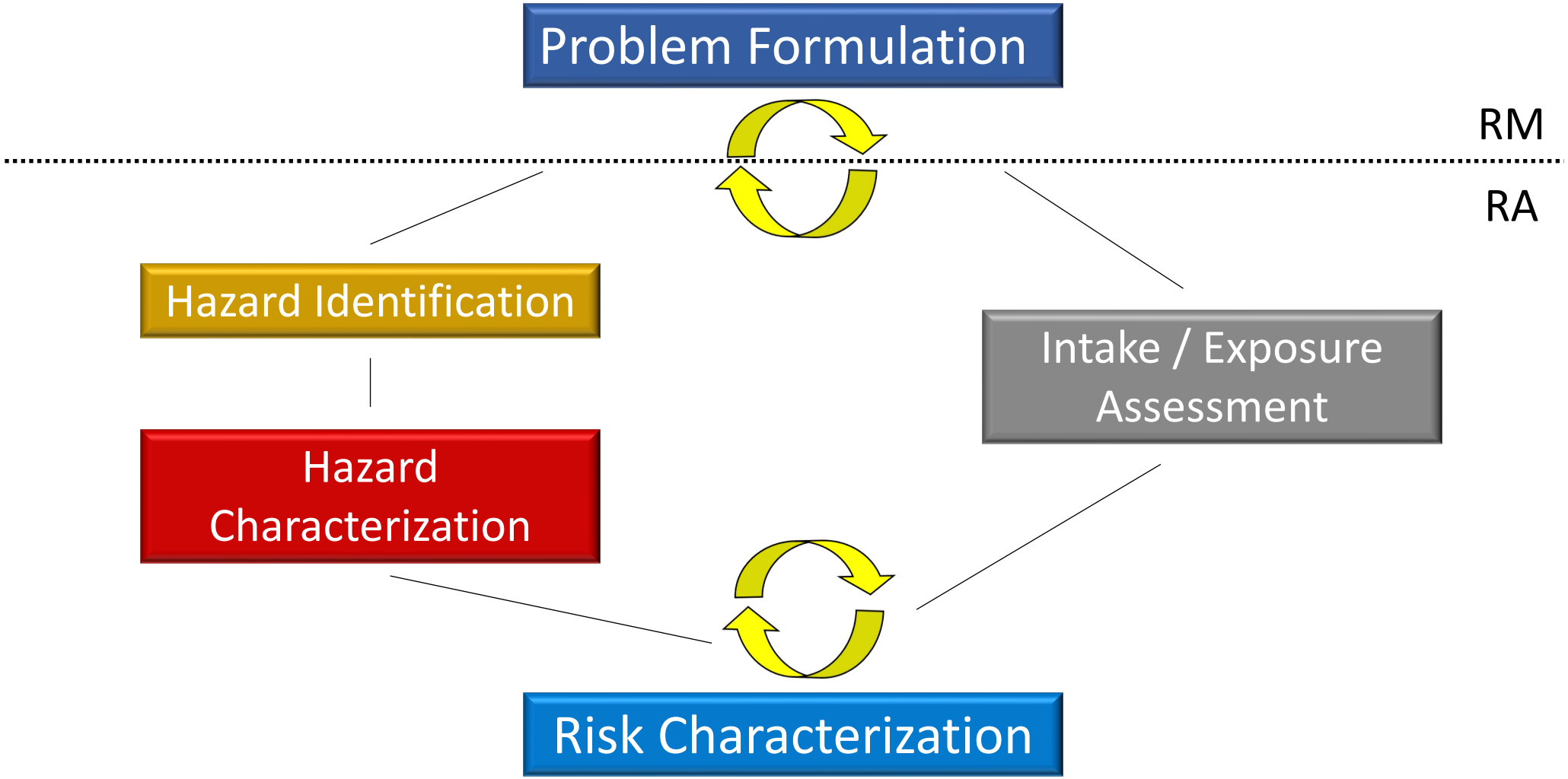
Starting the Risk Assessment Process



Moving to Scientific Assessment



Risk Assessment Procedure: A Scientific Process



Data Needed for Assessment / Needed by JECFA

Toxicological data:

- ❑ Metabolism and pharmacokinetic studies
- ❑ Short-term toxicity, long-term toxicity / carcinogenicity, reproductive toxicity, and developmental toxicity studies in animals and genotoxicity studies
- ❑ Epidemiological studies
- ❑ Special studies designed to investigate specific effects, such as the mechanism of toxicity (including interactions among related contaminants), immune responses, or macromolecular binding

Occurrence data:

- ❑ Levels and patterns of occurrence (and co-occurrence) of the contaminant in raw commodities and finished food products
- ❑ Levels of the contaminant in animal feed
- ❑ Information on carry-over from feed to animals for human consumption
- ❑ Effects of processing on contaminant in food as consumed and in feed
- ❑ Analytical techniques used by investigators or authorities for identifying and quantifying the contaminant in foodstuffs and/or human and animal tissues;
- ❑ Sampling protocols
- ❑ Methods available for the prevention and control

Assessment of Chemicals in Food

Data sources:

- ❑ Regulatory data submission by manufacturer/industry
  - For compounds intentionally added to foods
- ❑ Data from governments
  - Monitoring data; epidemiological data; research data
- ❑ Open scientific literature
  - Experimental research, human data

Assessment of Hazards and Exposure in Food: Data Characteristics

Data for hazard assessment:

- ❑Experimental (toxicological) studies performed according to (inter)national guidelines (e.g. OECD text guidelines)
  - Independent of country or region!
- ❑Human data: epidemiological data; occupational data; volunteer studies
  - May reflect susceptibility (e.g. genetic predisposition, life-style factors)

Data for dietary intakes/dietary exposure assessment:

- ❑National occurrence and consumption data
- ❑International and national dietary intakes/exposure estimates

thank you
danke
謝謝
ngiyabonga
рахмат
teşekkür ederim
Баярлалаа
спасибо
mersi
kia ora
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shukriya
mercé
мерси
তোমাকে ধন্যবাদ
감사합니다
xièxie
ευχαριστώ
merci