Ministry for Primary Industries
Manatū Ahu Matua

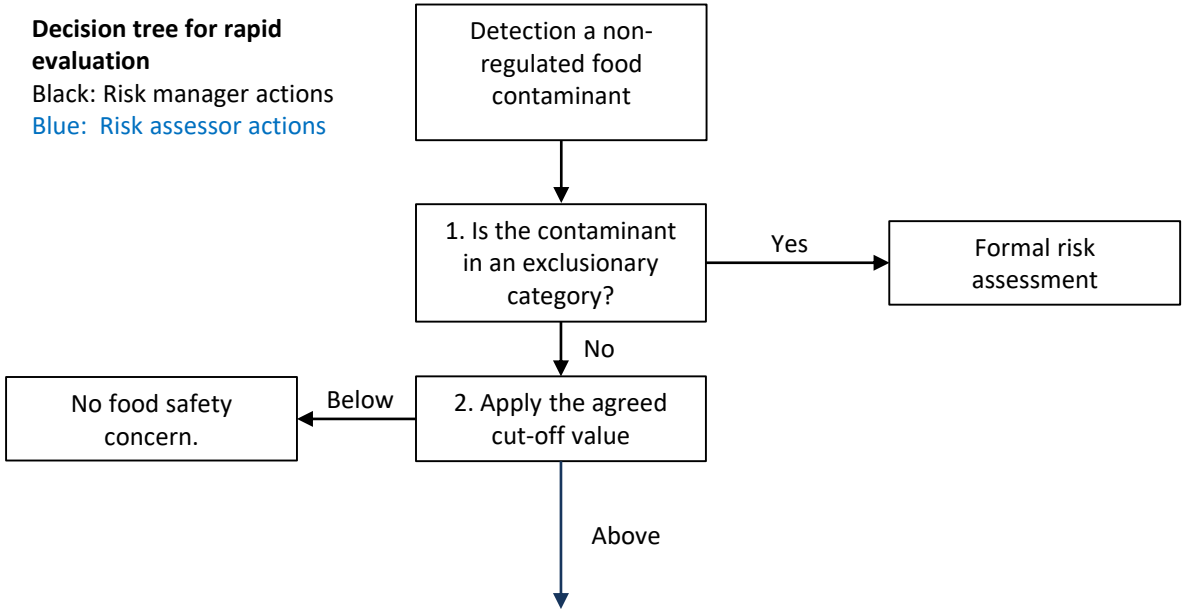
Establishing a cut-off value

Dr Andrew Pearson

Specialist Adviser (Environmental Chemistry & Toxicology)

Decision tree

Decision tree for rapid evaluation
Black: Risk manager actions
Blue: Risk assessor actions



Commence rapid risk assessment

Principle of a cut-off value

- Protective of health
  - Ensures chemical exposure that could be a food safety concern is flagged for further risk assessment
  - Parameters allow application to all countries
- Easy to apply
  - A one or two tier set of levels
  - Limits need for risk assessment resources
  - Can be applied by risk managers
- Practicable
  - Not set a level unachievable for analytical performance

Overarching constraints

- Guidelines apply to incidental contaminants.
  - History of exposure unknown
  - Further dietary sources could be established
  - Would not apply to exclusionary categories (dioxins /aflatoxins etc).
- Continued detections may lead to a more systematic risk based approach/ standards setting
  - A cut-off value may only apply for a set period

Populations of concern

- What age groups to consider
  - Adults: 60kg

- TTC thresholds obtained from NOAELs in lifetime / repeated dose trials.
- EFSA established Cramer classes I and III sufficiently protective for reproductive and developmental effects.

GEMS diet cluster intakes

- Maximum consumption value across clusters for each food
- 415 level 3 foods can be categorised as:

<=0.1 g/day	17
>0.1 to 1 g/day	95
>1 to 10 g/day	193
>10 to 100 g/day	90
>100 g/day	20

Intake considerations

- One level of intake
  - No food in the GEMS diet clusters has more the 500g/day intake
  - Would be conservative for many foods
  - Most (91%) food types are 0.1-100 g/day
- Multiple levels of intake
  - E.g. Staple vs not-staple
  - May require expert advice to interpret
  - Could differ between sub-populations

Most conservative approach in setting a cut-off

- TTC decision tree Genotoxicity Threshold: 0.0025 µg/kg bw/day
  - Applicable to compounds with genotoxic/carcinogenic triggers only
  - exposure level at which the carcinogenic risk for the vast majority of chemicals would not exceed the level of 1 in 10^6 risk
  - Based off lifetime exposure data in rodents
  - High potency carcinogens are excluded

Most conservative cut-off option

- TTC decision tree Genotoxic threshold
- Adult intake (BW 60kg)
- Maximum likely food intake: 500 g/day

- Cut-off value = **0.3 µg/kg**

  Is this value achievable for analytical capabilities?

Diet proportion input

- Assumption that only 10% of the daily food intake would be affected by incidental contamination.
- With a 1.5 kg/day adult food intake equates to 150 g/day.
- TTC decision tree Genotoxic threshold
- Cut-off value = **1 µg/kg**

Radionuclide GL approach

- Calculation method already in the GSCTFF
- 10% fraction of annual food supply (Adults: 550 kg x 0.1):
- Converted to daily intake = 155 g/day
- Applied in similar circumstances to proposed cut-off

A second tier?

- For compounds with no genotoxic alerts
- OP/C threshold : 0.3 µg/kg bw/day
  - Are OP/C compounds likely to be encountered outside of regulated agricultural chemicals?

- Cramer class III: 1.5 µg/kg bw/day
- Ease of screening for genotoxic alerts?

Two tier – Genotoxic/non-genotoxic

- First tier conservative cut-off (genotox)=

  0.3 µg/kg
- If exceeded risk assessor screens for genotoxicity /carcinogenicity triggers.
- If negative then apply Class III threshold:
- Second tier cut-off value = **180 µg/kg**
  - However little value in taking this approach over immediately commencing the TTC decision tree

Summary

- A number of input parameters to agree upon in establishing a cut-off value.
- A range of options available to establish a cut-off
- Important to ensure the cut-off achieves its goals
  - Protective of health
  - Simple to apply
  - Practicable

A proposal

- One approach (RN GL) is currently established in GSCTFF
- Adapt this approach to the Guideline:

Cut-off value : 1 µg/kg