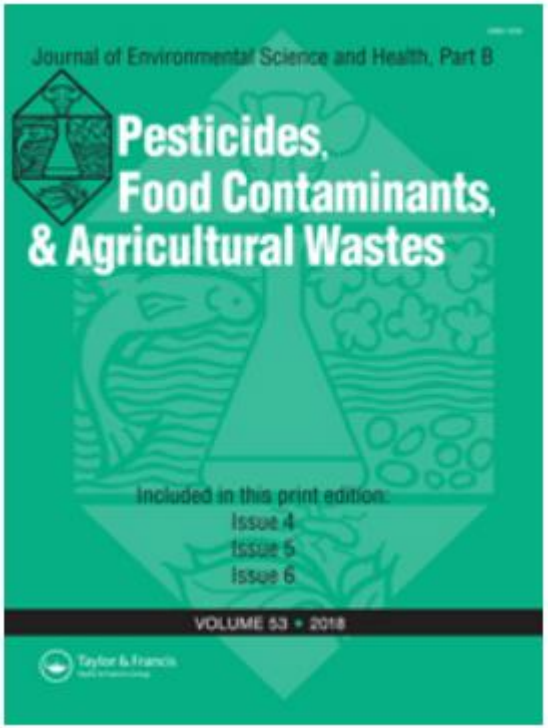

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Pesticides, Food Contaminants, and Agricultural Wastes

The International Estimate Short-Time Dietary Intake (IESTI) Revision and its Consequences

anses
French agency for food, environmental and occupational health & safety
Investigate, evaluate, protect

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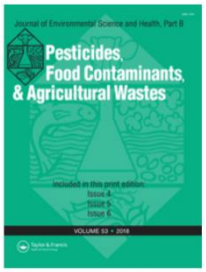


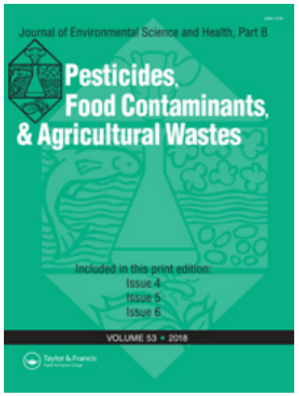
CONTENTS

Volume 53 Number 6 2018

Special Issue: The International Estimate of Short-Term Intake (IESTI) Revision and its Consequences
Guest Editors: Árpád Ambrus and Denis Hamilton

FOREWORD

ARTICLES



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Pesticides, Food Contaminants, and Agricultural Wastes

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Setting the stage for the review of the international estimate of short-term intake (IESTI) equation

Anke Richter, Christian Sieke, Hermine Reich, Bernadette C. Ossendorp, Nicolas Breysse, Jason Lutze, Karin Mahieu, Sam Margerison, Anton Rietveld, Xavier Sarda, Gaelle Vial & Trijntje van der Velde-Koerts

General Historical Background.

- Acute Risk exposure
  - From 1997 FAO/WHO Geneva Consultation

    To 2015 Geneva Workshop.

- Description of the equations

- Cases

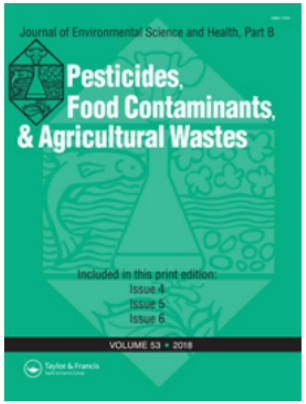
- Details for each of the parameters

2015 Geneva Workshop main recommendations

- Replace the HR and STMR by the MRL in all cases of the IESTI equation
- Use a default variability factor of 3
- Derive the P97.5 large portion from the distribution of consumption values expressed as g/kg body weight
- Proposal to remove the unit weight from the IESTI equations

Current and proposed EU equations for IESTI

Current IESTI equations (as mg/kg bw/day)		Proposed IESTI equations (as mg/kg bw/day)
Case 1 (small-sized commodities, unit weight < 0.025 kg)	$\frac{LP\_pers \times HR}{bw}$	$LP_{bw} \times MRL \times CF$
Case 3 (bulked commodities)	$\frac{LP\_pers \times STMR}{bw}$	
Case 2a (medium sized commodities, unit weight ≤ large portion)	$\frac{\{U_e \times HR \times v\} + \{(LP\_pers - U_e) \times HR\}}{bw}$	$LP_{bw} \times MRL \times CF \times v$ with v=3
Case 2b (large sized commodities, unit weight > large portion)	$\frac{LP\_pers \times HR \times v}{bw}$	



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Impact of a proposed revision of the IESTI equation on the acute risk assessment conducted when setting maximum residue levels (MRLs) in the European Union (EU): A case study

Nicolas Breysse, Gaelle Vial, Lauriane Pattingre, Bernadette C. Ossendorp, Karin Mahieu, Hermine Reich, Anton Rietveld, Christian Sieke, Trijntje van der Velde-Koerts & Xavier Sarda

European data: Global MRL Review 2013/2016

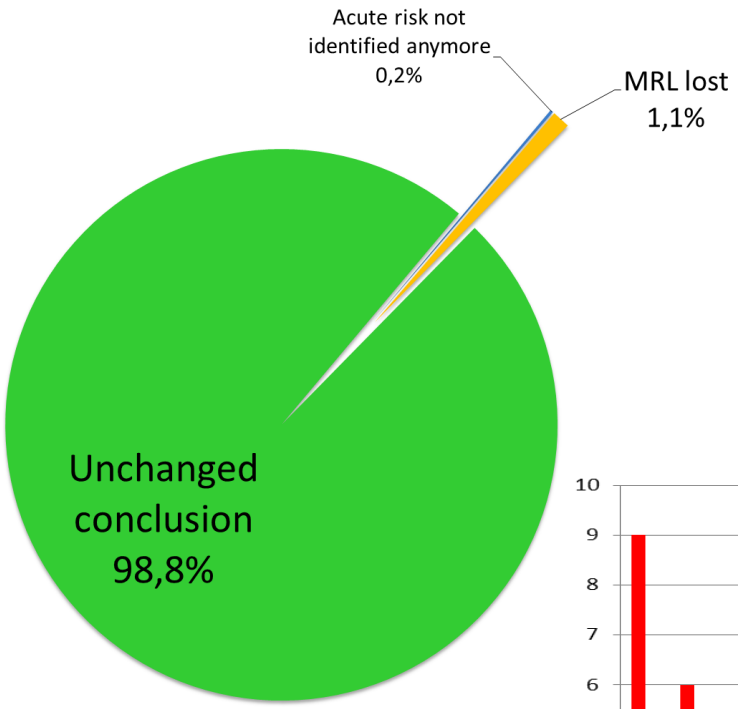
- 53 active substances
- 13 diets (PRIMo rev.2)
- 264 commodities (29 from animal origin)

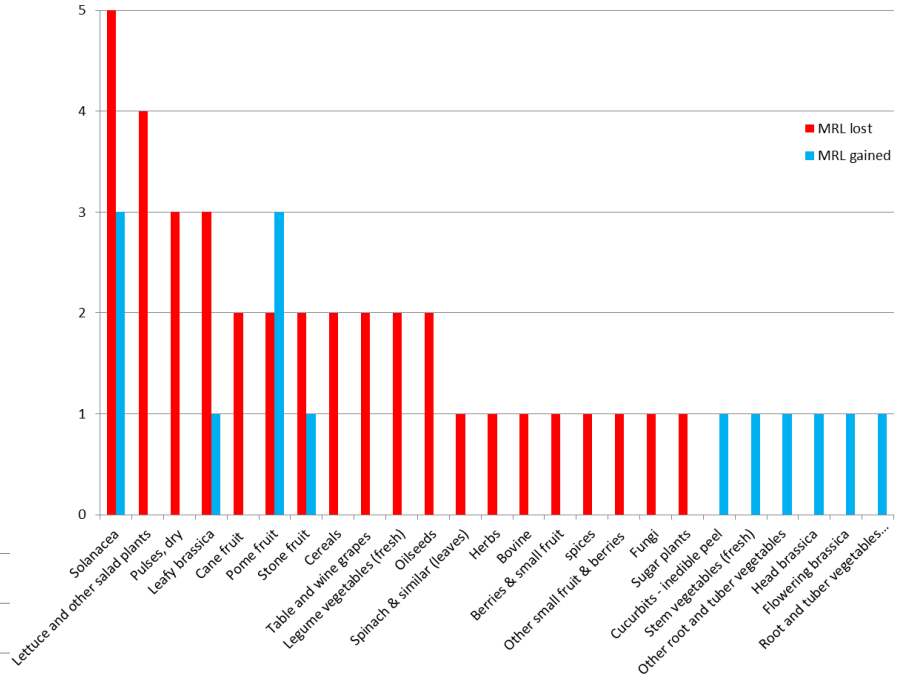
→3110 couples [substances; commodities] : 2268 plant commodities; 842 animal commodities)

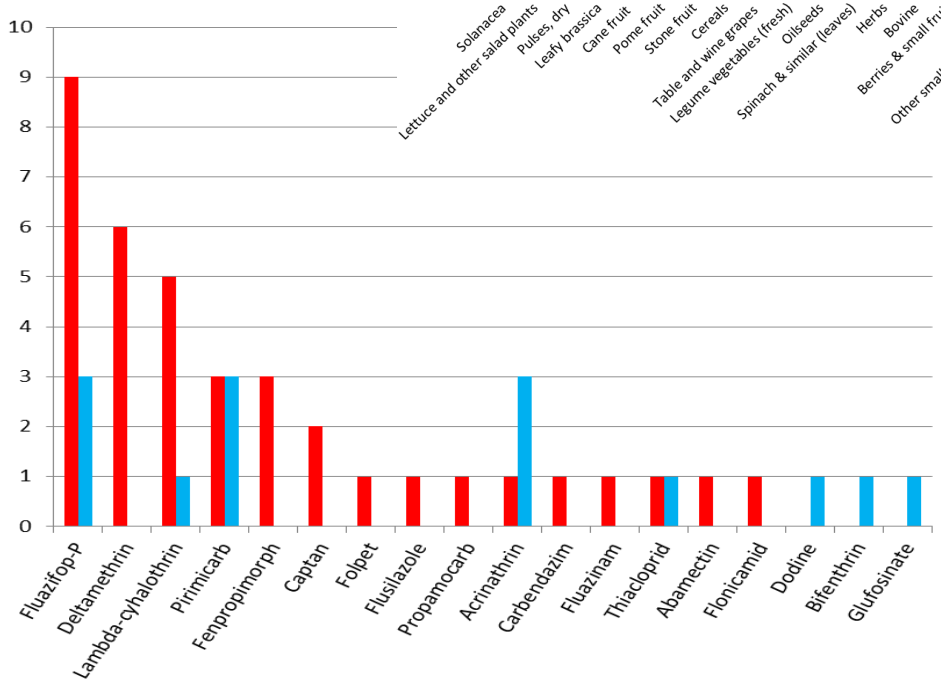
→ 40430 theoretical acute exposure:

→ absence of consumption data for some commodities: 21322 acute exposures

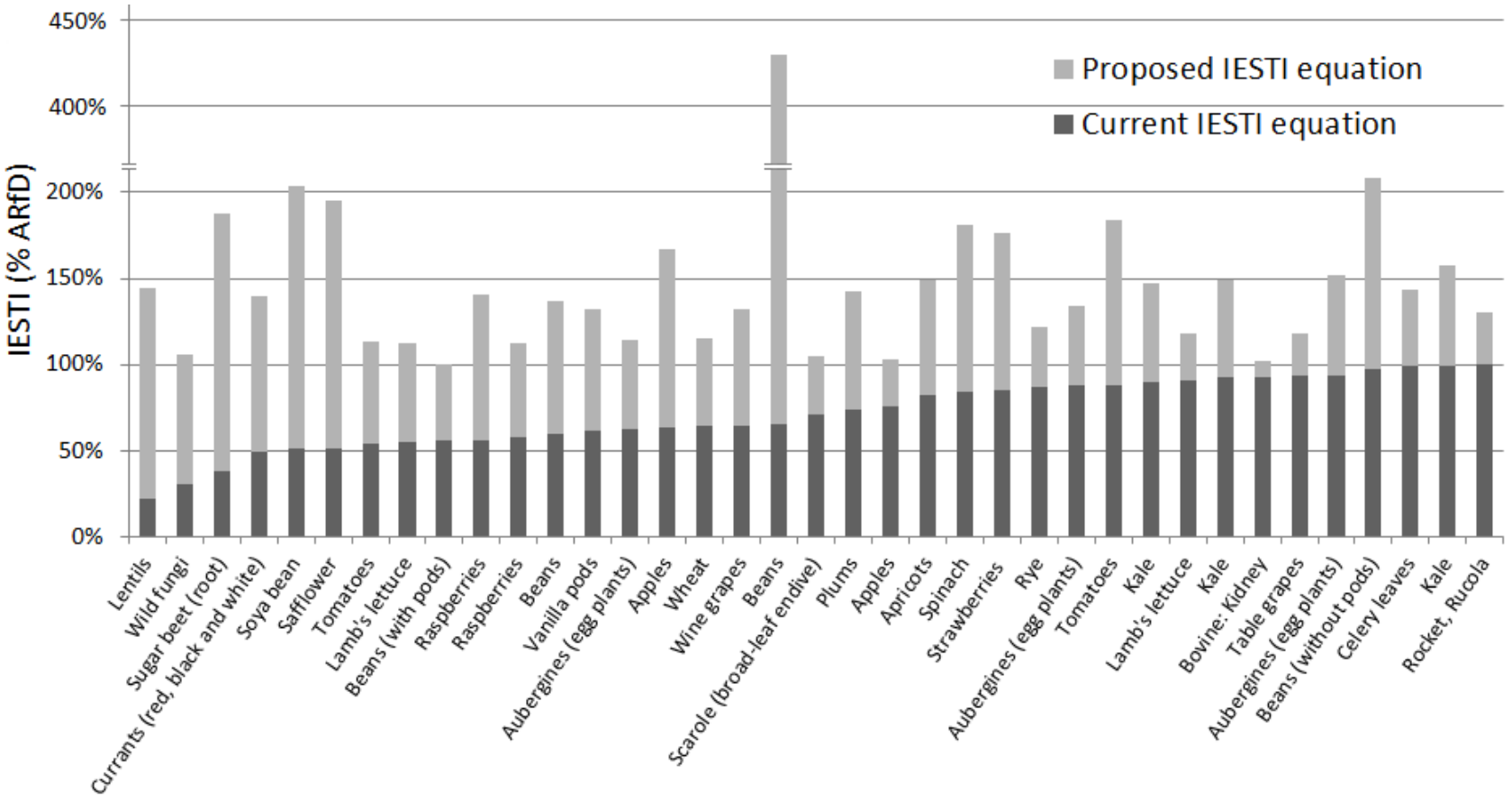
Impact on MRL settings

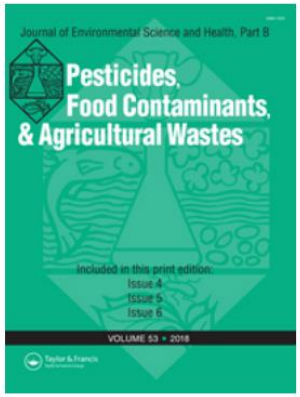






Lost MRL are not linked to how close the exposure was to the ARfD





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Impact of proposed changes in IESTI equations for short-term dietary exposure to pesticides from Australian and Codex perspective

Trijntje van der Velde-Koerts, Sam Margerison, Nicolas Breysse, Jason Lutze, Karin Mahieu, Hermine Reich, Anton Rietveld, Xavier Sarda, Christian Sieke, Gaelle Vial & Bernadette C. Ossendorp

Method: JMPR data (2011-2014)

88 active substances

- 15 herbicides
- 33 fungicides
- 40 insecticides

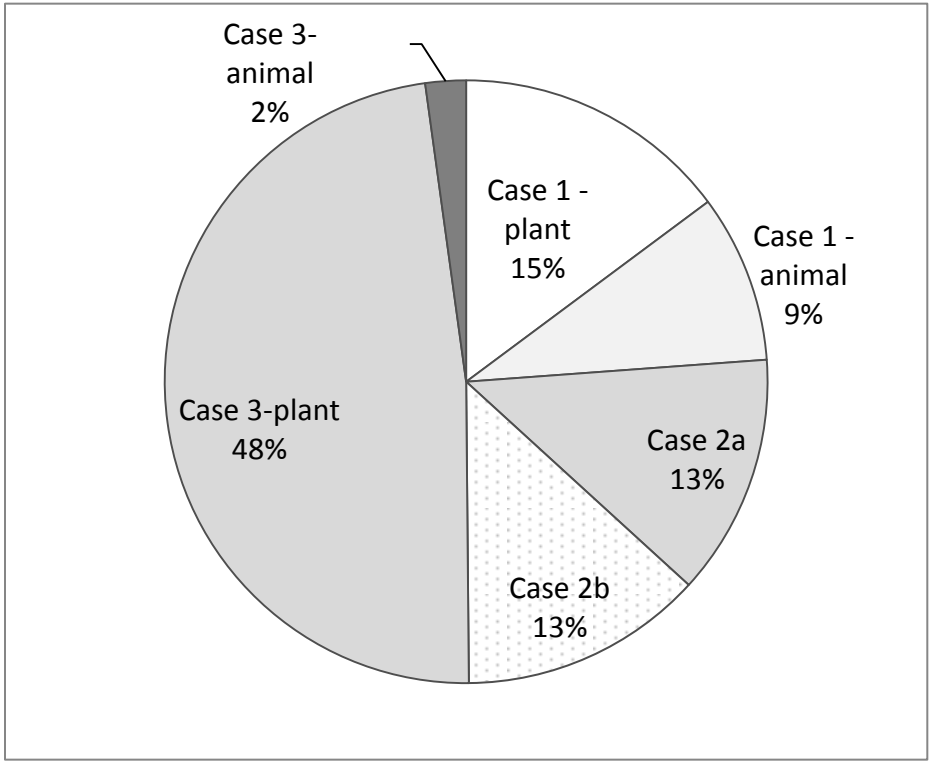
1110 MRLs

- 339 MRLs ARfD not necessary
- 771 MRLs with ARfD

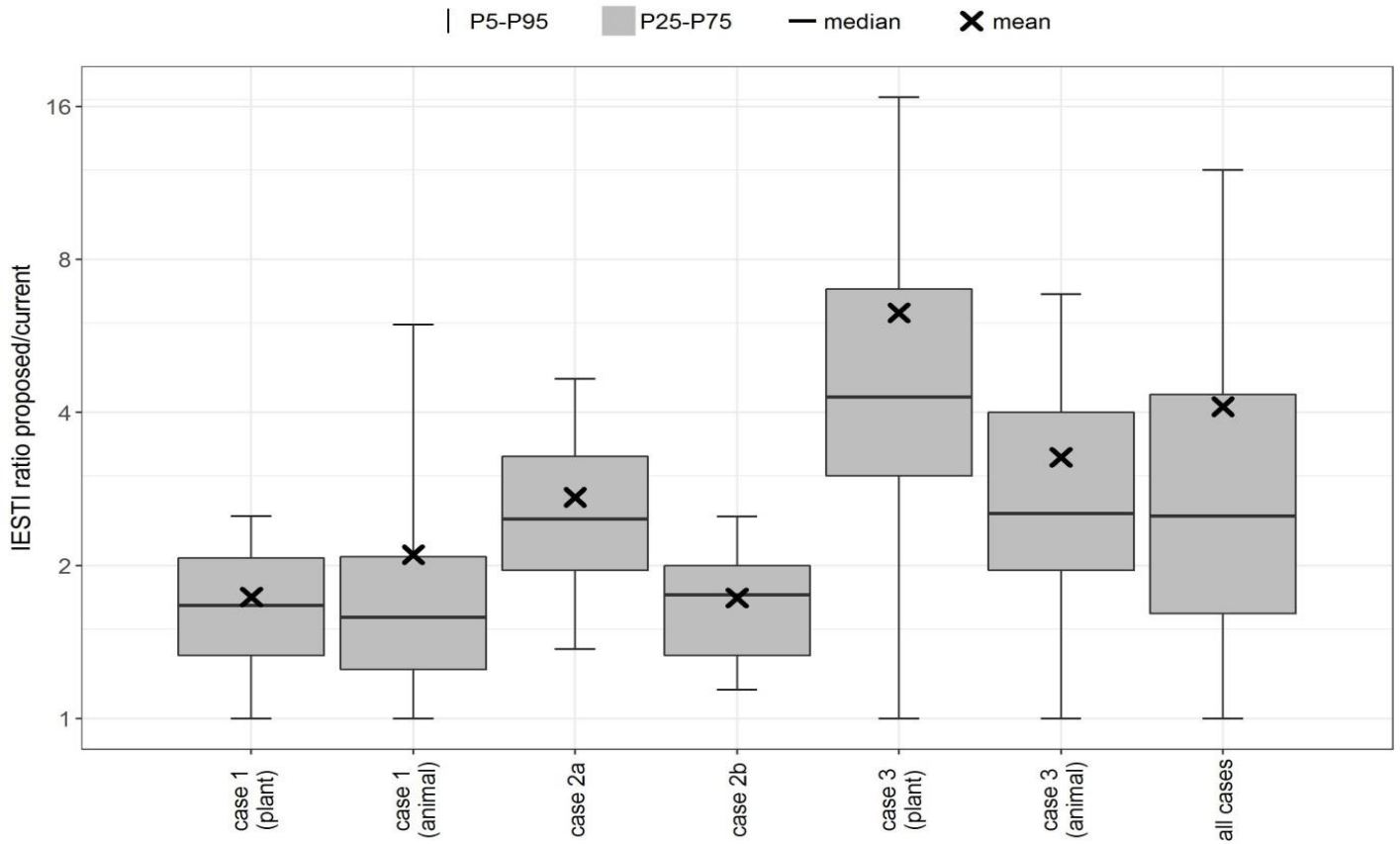
1063 large portions

8366 MRL-LP combinations

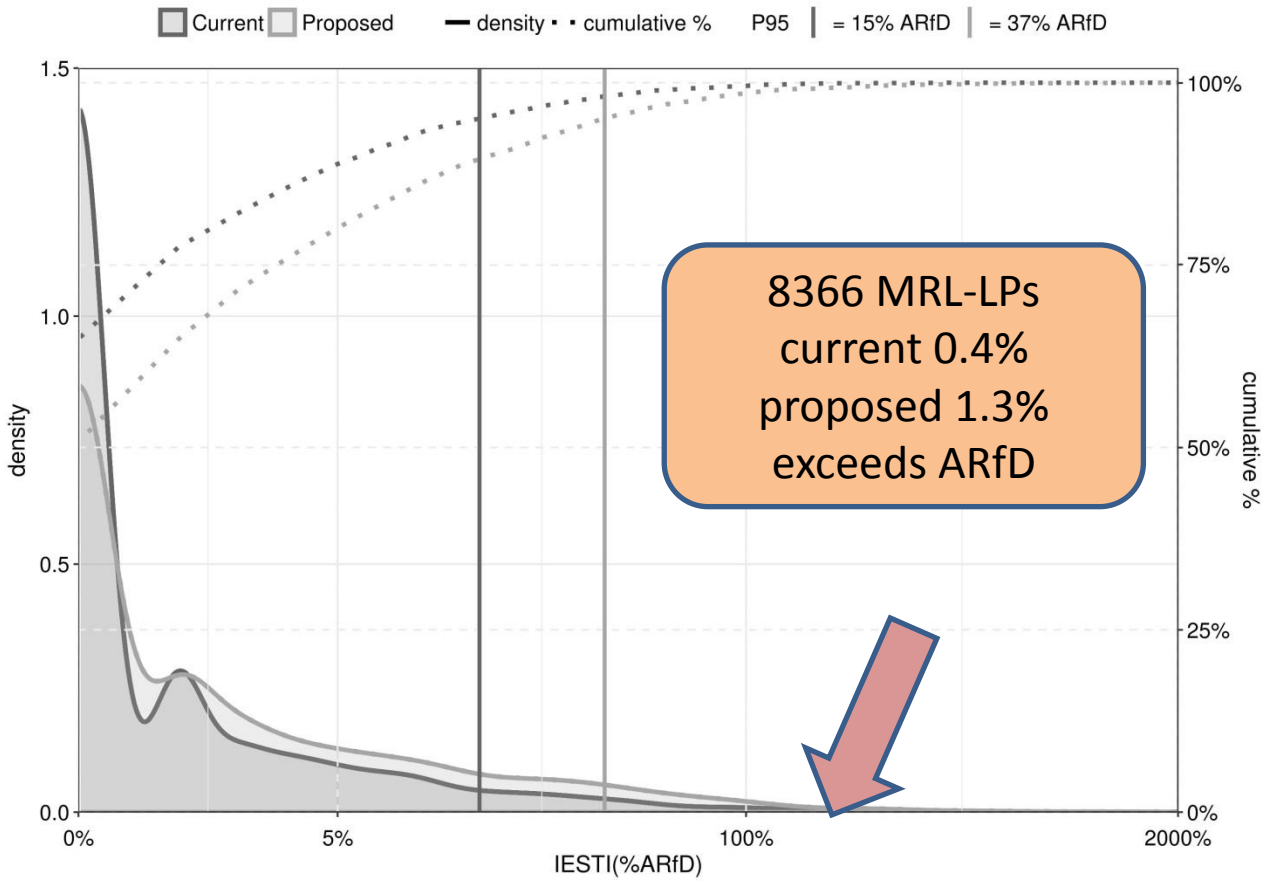
- 1011 STMR&HR =0
- 7355 IESTI ratio > 0
  - 743 MRL=LOQ
  - 6612 MRL>LOQ

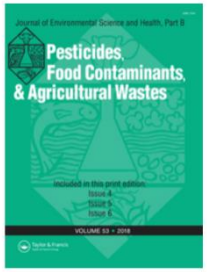


Increase in short-term dietary exposure



Exposure distribution as %ARfD





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Effect of individual parameter changes on the outcome of the estimated short-term dietary exposure to pesticides

Trijntje van der Velde-Koerts[a], Nicolas Breysse[b], Lauriane Pattingre[b], Paul Y. Hamey[c], Jason Lutze[d], Karin Mahieu[a], Sam Margerison[d], Bernadette C. Ossendorp[a], Hermine Reich[e], Anton Rietveld[a], Xavier Sarda[b], Gaelle Vial[b], and Christian Sieke[f]

[a]National Institute for Public Health and the Environment (RIVM), Centre for Nutrition, Prevention and Health Services (VPZ), Bilthoven, The Netherlands; [b]French Agency for Food, Environmental and Occupational Health and Safety (ANSES), Regulated Products Assessment Department, Maisons-Alfort, Val de Marne, France; [c]Health & Safety Executive, Chemicals Regulation Division, York, UK; [d]Australian Pesticides and Veterinary Medicines Authority, Canberra, Australia; [e]European Food Safety Authority, Parma, Italy; [f]Federal Institute for Risk Assessment (BfR), Pesticide Safety Department, Berlin, Germany

Method: Synthetic /real dataset.

- synthetic residues or measured residue data from EU and JMPR.

- Synthetic residue data
  10,000 random residue datasets per commodity (and thus also 10,000 MRLs) , each consisting of 4 (minor crops), 8 (major crops)or 16 (global dataset) individual values.

Assess every proposed modification

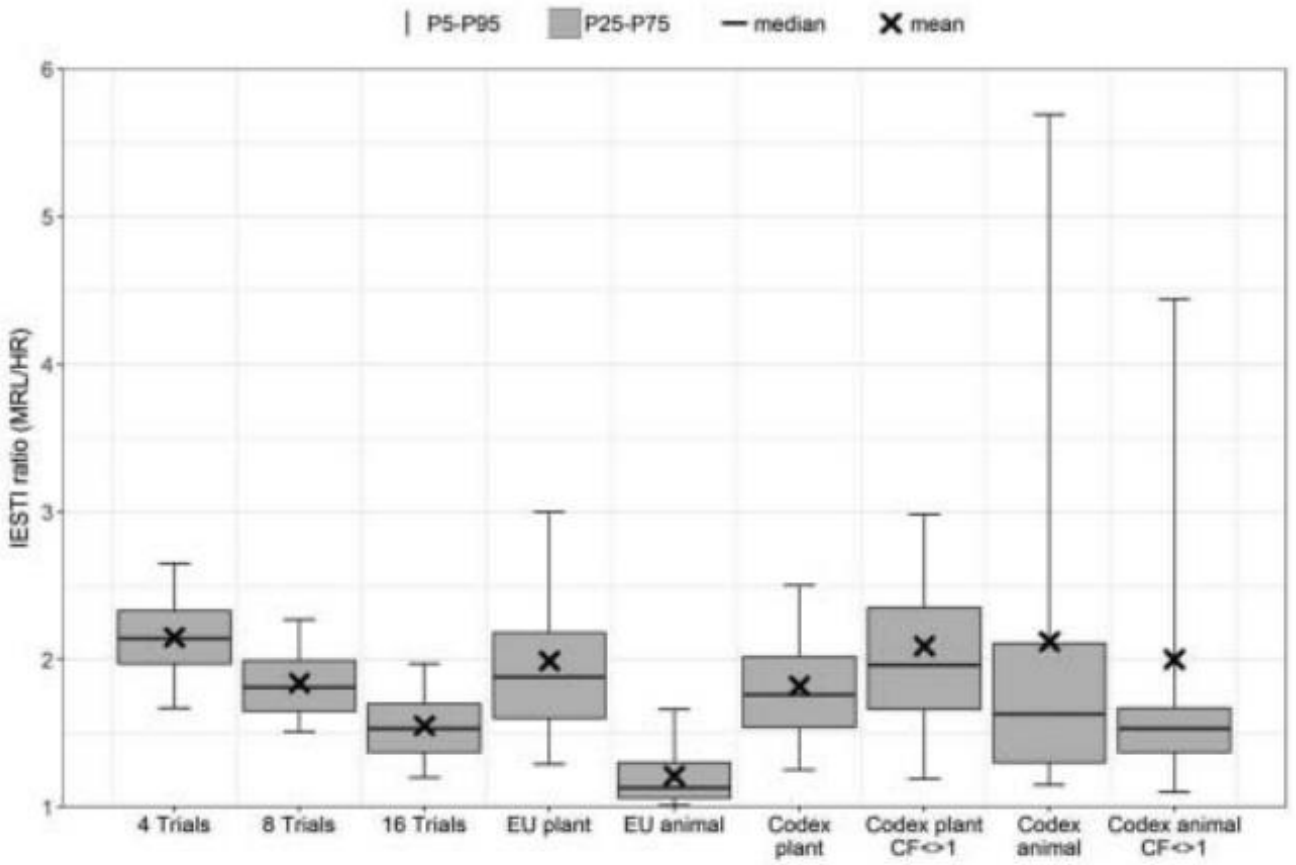
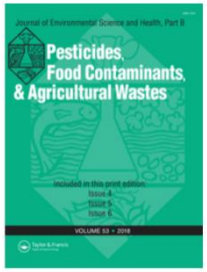


Figure 1. Effect of change from HR to MRL using synthetic residue data (4, 8 or 16 trials), EU or Codex (JMPR) plant and animal residue data without or with residue specific conversion factor (CF <> 1).

- The highest increase in the estimated exposure arises from the replacement of the median residue (STMR) by the maximum residue limit (MRL) for bulked and blended commodities (case 3 equations).
- The change in large portion parameter does not have a significant impact on the estimated exposure
- The number of residue trials used to define MRL as a significant impact.



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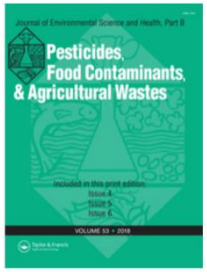
Factors affecting the quantitative uncertainty of the estimated short-term intake. Part I—Calculation methods

Árpád Ambrus[a], Zsuzsanna Horváth[b], Júlia Szenczi-Cseh[c], and István J. Szabó[a]

[a]Retired from National Food Chain Safety Office, Budapest, Hungary; [b]Szent István University, Faculty of Food Science, Food Safety Doctoral School, Budapest, Hungary; [c]National Food Chain Safety Office, Directorate for Food Safety Risk Assessment, Budapest, Hungary



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Factors affecting the quantitative uncertainty of the estimated short-term intake. Part II—Practical examples

Árpád Ambrus[a], Zsuzsannna Horváth[b], and Júlia Szenczi-Cseh[c]

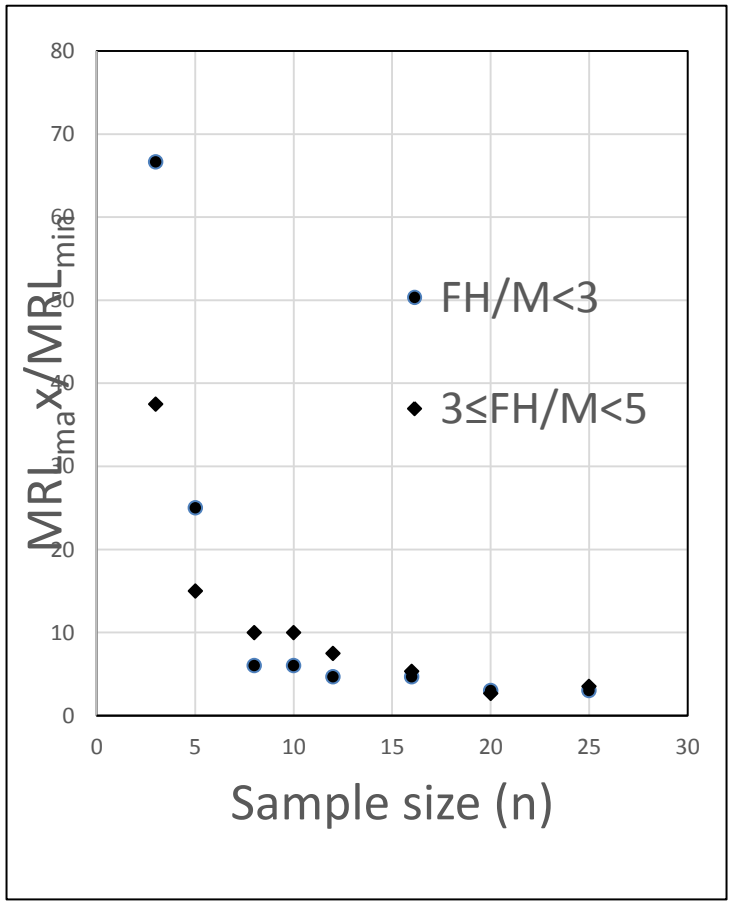
[a]Retired from National Food Chain Safety Office, Budapest, Hungary; [b]Szent István University, Faculty of Food Science, Food Safety Doctoral School, Budapest, Hungary; [c]National Food Chain Safety Office, Directorate for Food Safety Risk Assessment, Budapest, Hungary

Factors affecting the quantitative uncertainty of the estimated short-term intake

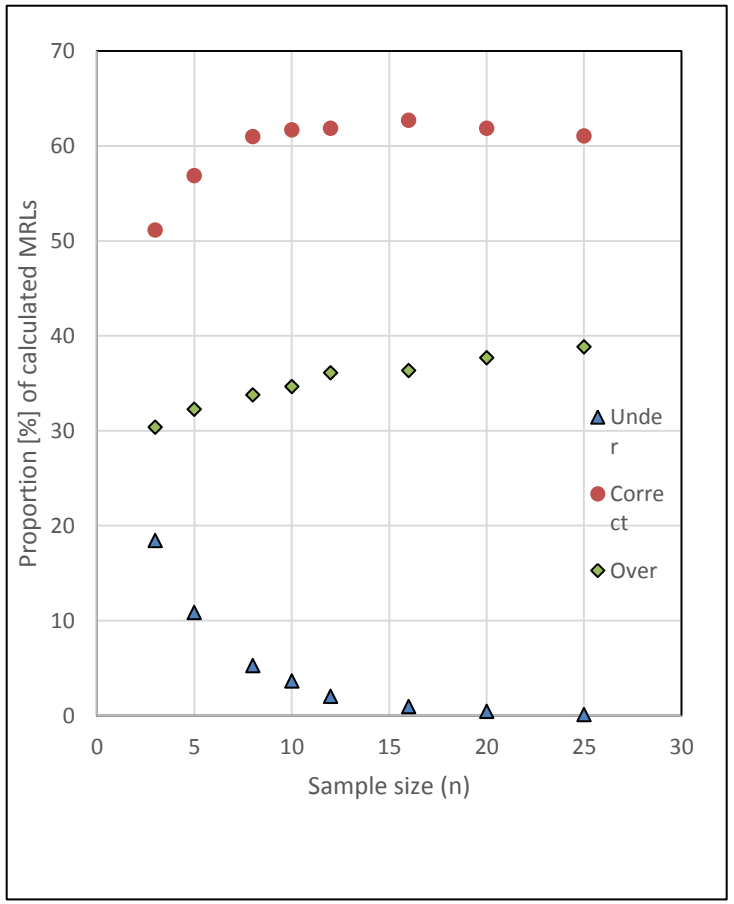
Summary of calculated relative standard deviations of input parameters

Parameter	No of data	Value	CV (RSD)
Unit crop mass	922	220 g	1.4%
HR		0.49	23.9%
Variability factor	20999	3	1.46%
LP (P0.975 eaters)	4720	10g/kg	89%
Body weight [kg]			0.096%
MRL	25766		21.9%
IESTIc			54%
IESTIp			91.7%

Uncertainty of calcuated MRL



F.1



F. 2

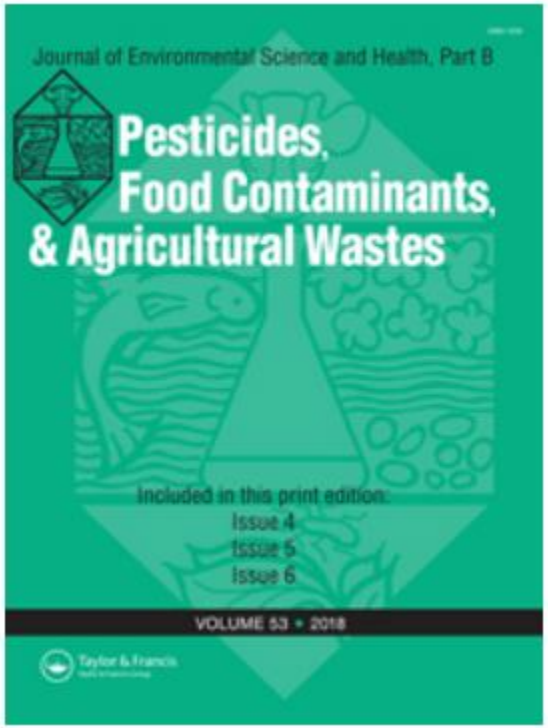
- The MRLs should be calculated from the results of ≥9 preferably ≥16 valid trials regardless whether the crop is minor or major.

- For ethephon residues in apples the $IESTI_{proposed}/IETI_{current}$ =2.8; CV_{IESTp}/CV_{IESTc} =1.7. The ratio depends on the pesticide and commodity. The major contributor to the uncertainty is the reported large portion.

- The proposed IESTI calculation method gives more conservative estimates for case 2a than the current one.

- The relative uncertainty of IESTI should be calculated for each case.

- The combined uncertainty of the calculated IESTI should be considered for dietary risk assessment.



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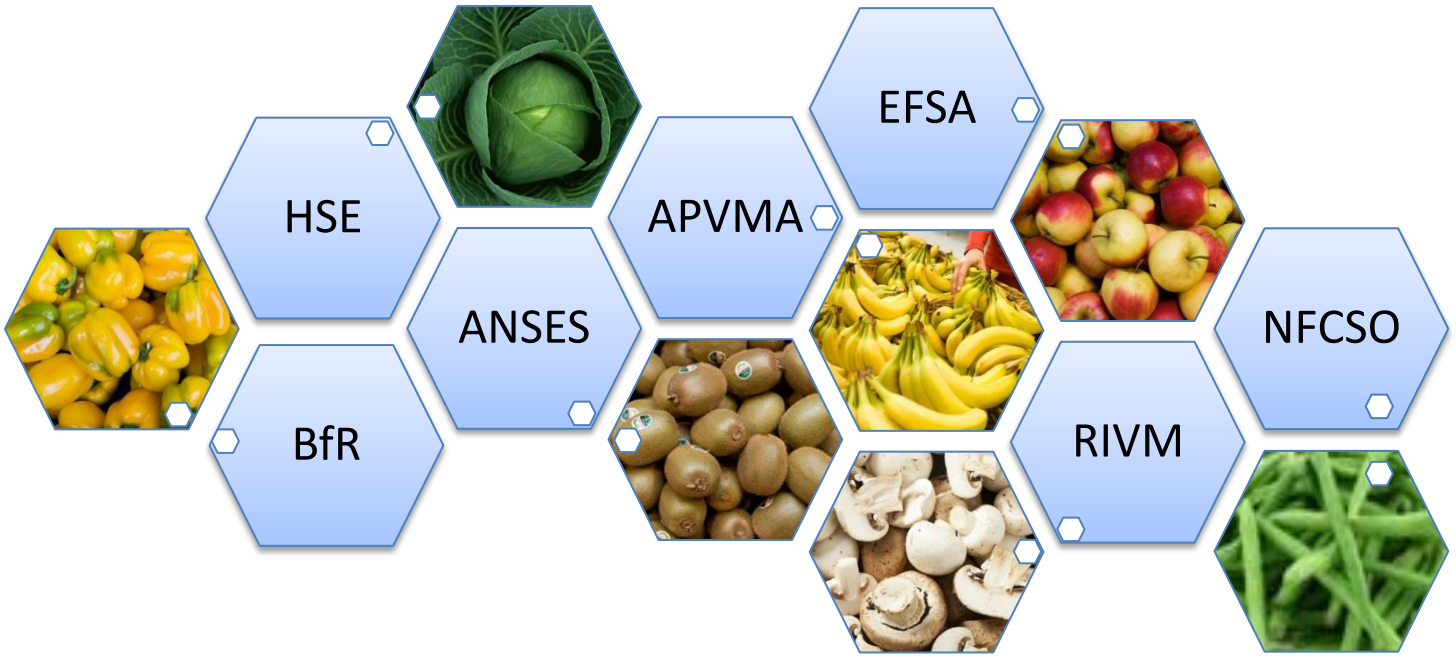
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