

Assessing risks of waste to land

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Wastes to land

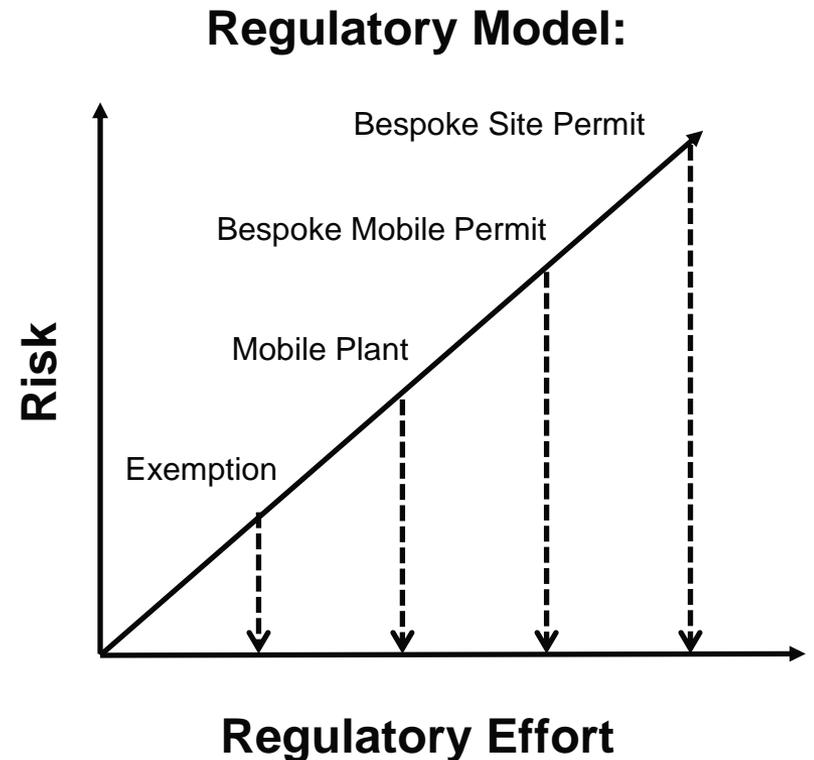
- ⇒ Recovery of waste and waste-derived materials
 - ⇒ Important source of nutrients and soil improvers
 - ⇒ Reduces costs to industry and land managers
 - ⇒ Increases resource efficiency

- ⇒ Facts & figures (SR4, 5 & 6)
 - ⇒ 310 permits (by 13/14)
 - ⇒ 2,356 deployments (in 13/14)
 - ⇒ approx 4.6 million tonnes*
 - ⇒ up to 120,000 ha



Spreading waste and waste-derived materials to land

- Landspreading of waste and waste-derived materials is an immature market driven by:
 - Diversion from landfill
 - Rising costs of traditional treatments
- Regulatory approaches
 - Exemptions (some being phased out)
 - Standard rules permits
 - Bespoke permits
 - End of waste decisions
- Relevant Objectives (WFD Art. 13)
- We want recovery without harm



Supporting our regulatory work

- ➔ Improving our understanding of risks to health and the environment
 - ➔ Working with others (e.g. Food Standards Agency)
 - ➔ Understanding the composition and hazards of existing and novel waste streams
- ➔ Developing tools to support decisions
 - ➔ Revision of soil screening values for soil ecotoxicity and function
 - ➔ WALTER model to assess risks to human health
 - ➔ e-tool to support the National Permitting Service assess standard rules deployments
- ➔ Technical advice to support operational issues
 - ➔ Supporting E&B and the End-of-Waste Panel
 - ➔ Supporting Area staff investigating deployments

Hazards from Landspreading Wastes

⇒ Background

- ⇒ Assessing risk requires a clear understanding of waste hazards
- ⇒ Knowledge of less common waste types is limited

⇒ Specific objectives

- ⇒ Develop a tailored methodology for rapid evidence assessment (REA)
- ⇒ Apply it to one or more waste types where current guidance is limited

⇒ Outcomes

- ⇒ Civil Service REA Toolkit and GL3, tailored to agricultural context
- ⇒ Work with waste producers to combine published & unpublished sources
- ⇒ Outputs include
 - Methodology for Rapid Evidence Assessment
 - Worked examples include paper sludge ash, sludges from on-site effluent treatment in the soft drinks industry, and cement kiln and by-pass dusts.

REA and Deployments

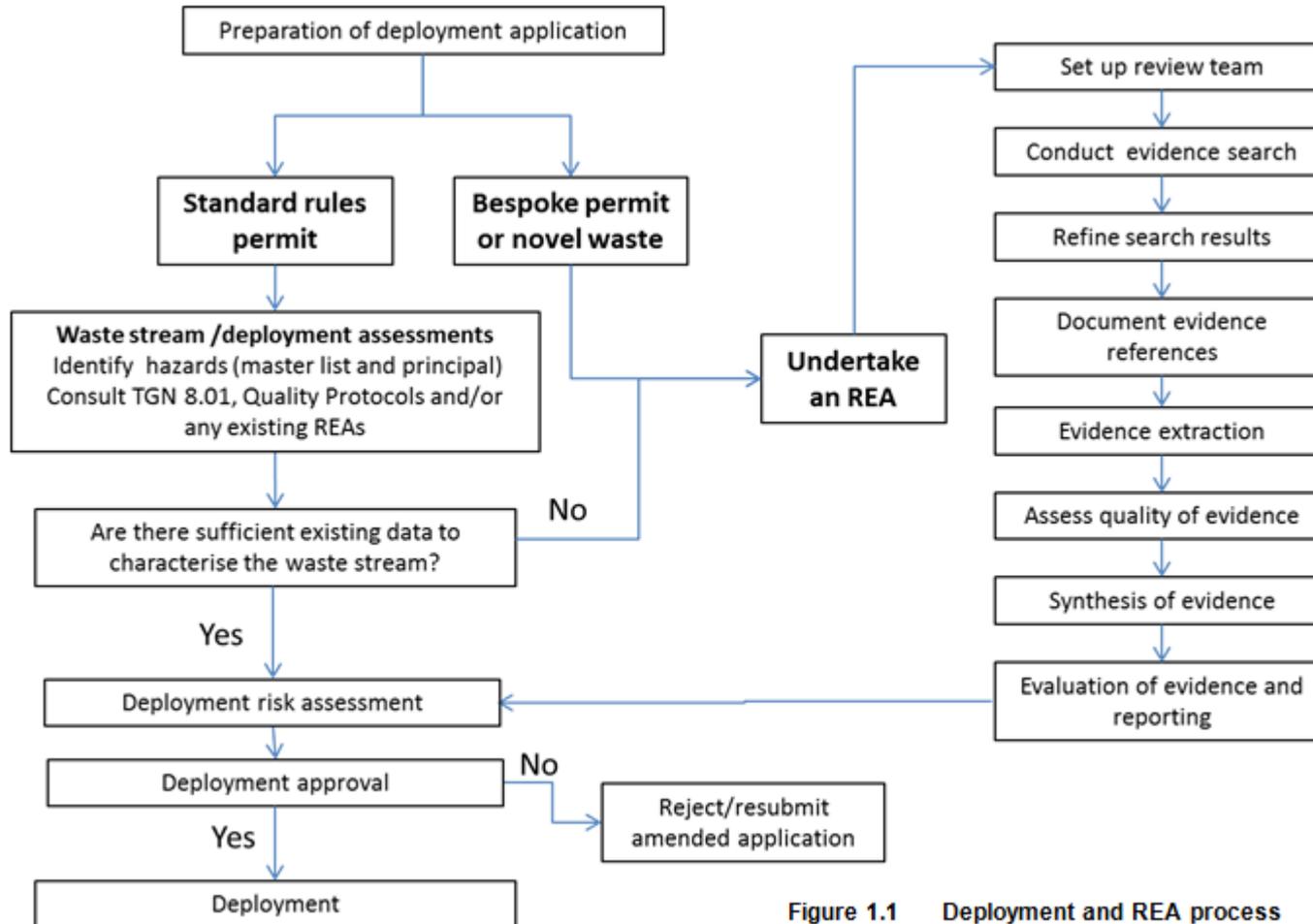


Figure 1.1 Deployment and REA process

Healthy Soils

- ⇒ Healthy soils are vital to a sustainable environment
- ⇒ Quality depends on complex interacting factors including inorganic and organic solids, structure, and a diverse and abundant micro- and macro-fauna
- ⇒ Wastes and waste-derived materials
 - ⇒ Benefit soils
 - ⇒ May introduce or increase existing contaminant levels



Soil Screening Values

- ➔ Soil Screening Values (SSVs) originally introduced by EA (2008) for use in Part 2A
- ➔ “...concentrations of chemical substances found in soils below which there are not expected to be any adverse effects on wildlife such as birds, mammals, plants and soil invertebrates, or on the microbial functioning of soils.”
- ➔ Scientifically derived to simplify assessment
- ➔ Screen out low risk sites (*or activities*)
- ➔ Not remediation standards or soil limits



Environment Agency

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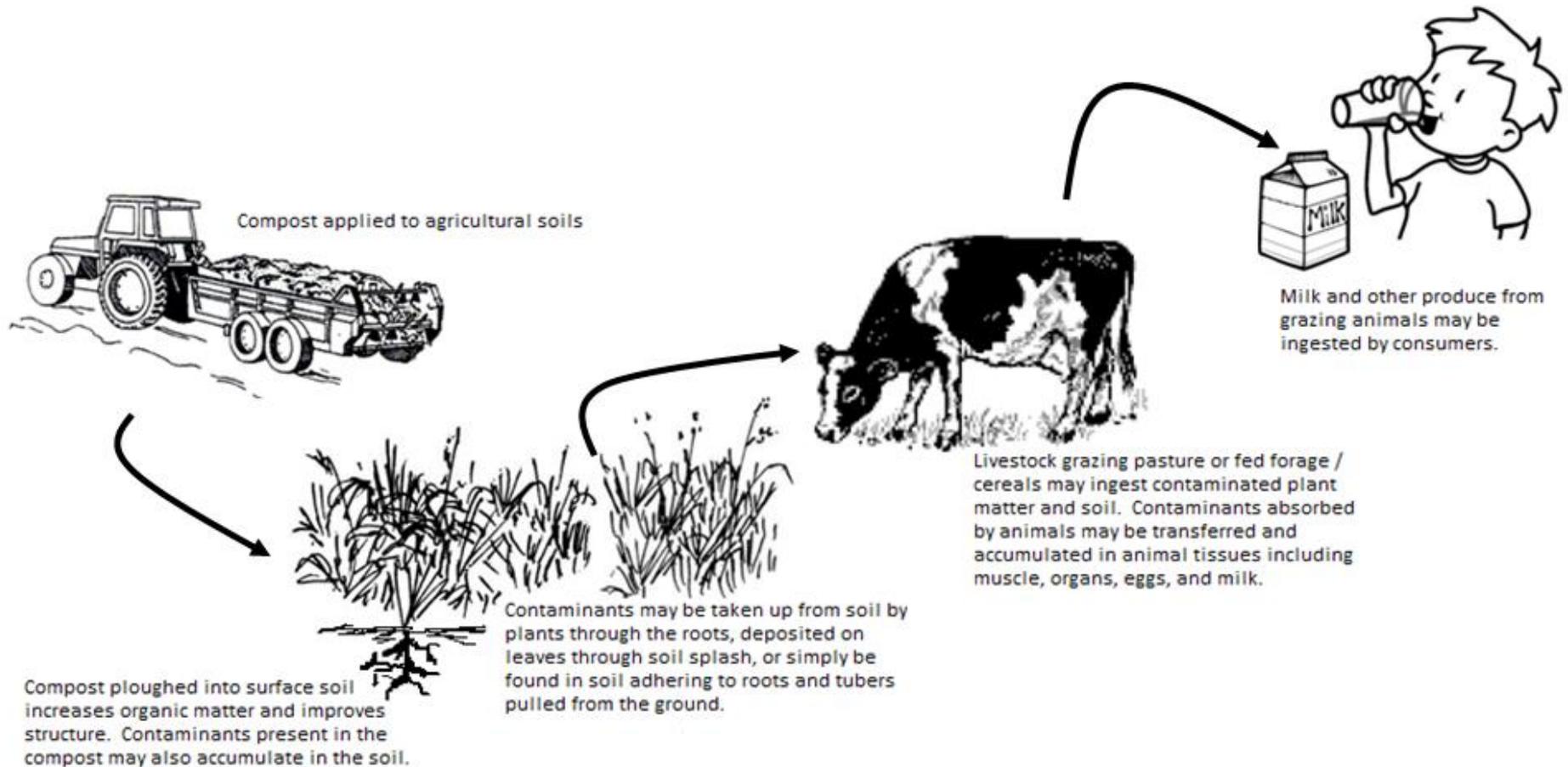
Guidance on the use of soil screening values in ecological risk assessment

Science report SCD70009/SR2b

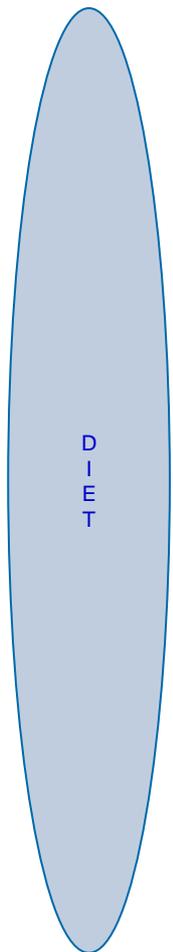
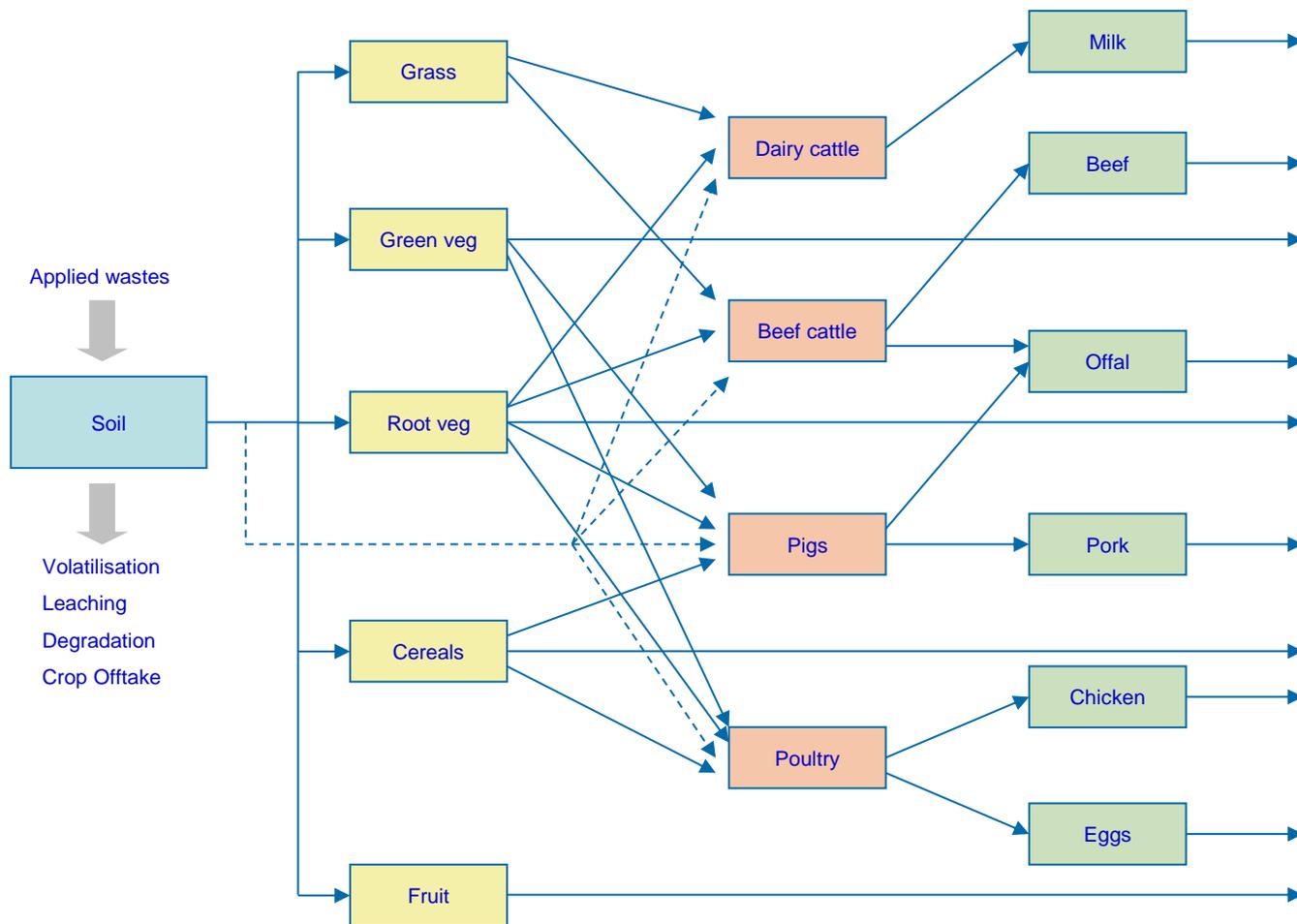
ShARE Project

- ➔ ShARE project to update and repurpose for assessing the landspreading of waste and waste-derived materials
- ➔ ShARE is a research partnership between DOE NI, EA, Irish EPA, NRW, and SEPA on topics of common interest
- ➔ Revised derivation methods developed under REACH and explicit step between science (PNEC) and practice (SSV)
- ➔ Expanded coverage to include more than 20 common PTE and many emerging POPs including pesticides, flame retardants, pharmaceuticals, and personal care products
- ➔ Apply to the receiving soil after landspreading and not the waste or waste-derived material
- ➔ To be published in Q1 (April – June) in 2016

Risks to consumer health



WALTER: Screening model for health risks



Model Outputs

Summary of Results for Human Health Risk Assessment

Receptor **Adult**

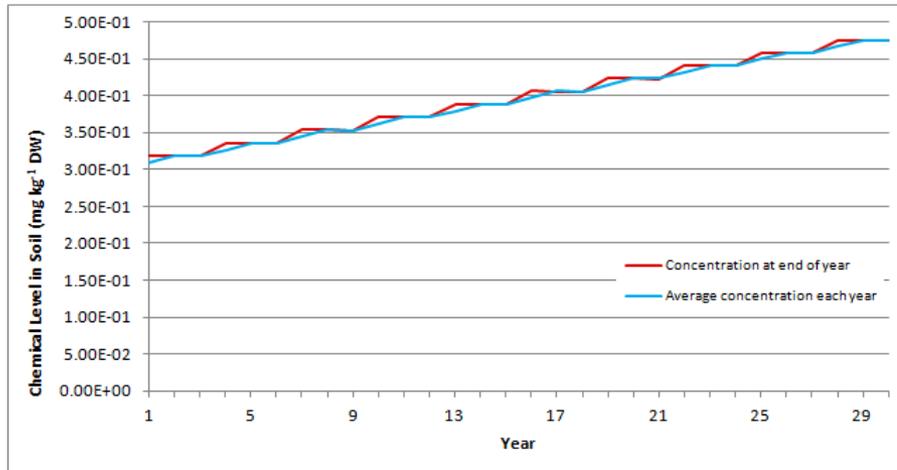
Chemical	Soil Concentrations (mg kg ⁻¹)		Soil enrichment (%)	Adult Intakes (mg day ⁻¹)		Infant Intakes (mg day ⁻¹)		Hazard Quotient	Advisory	Limits for animal feed		Limits for fo		
	Ambient	Max		Ambient	Max	Ambient	Max			Max (mg kg ⁻¹ F Limit exceeded)	Cereal Feed (mg kg ⁻² FW)	Green vegetabl		
Cadmium	3.00E-01	4.75E-01	58.5	1.22E-02	1.93E-02	3.50E-03	5.54E-03	0.70	No concern	3.46E-02	No	2.51E-02	No	2.47E-02

Soil enrichment

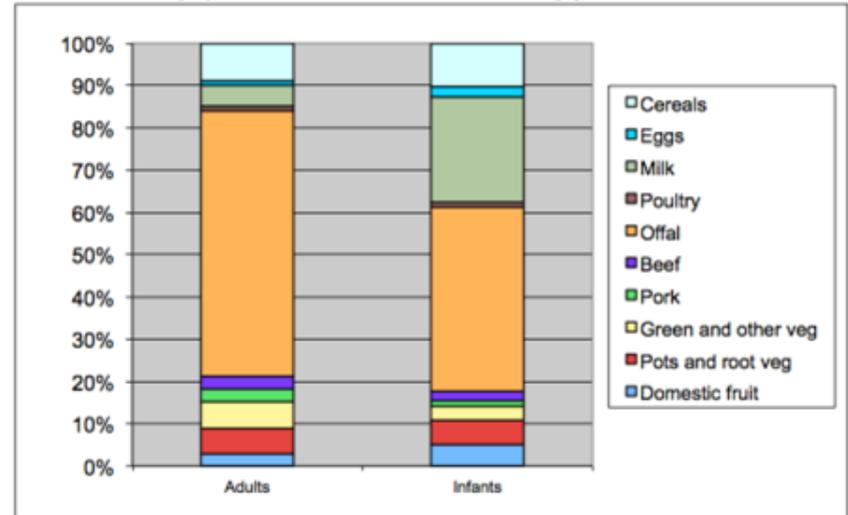
Human intakes

Feed / food limits

Soil Concentration

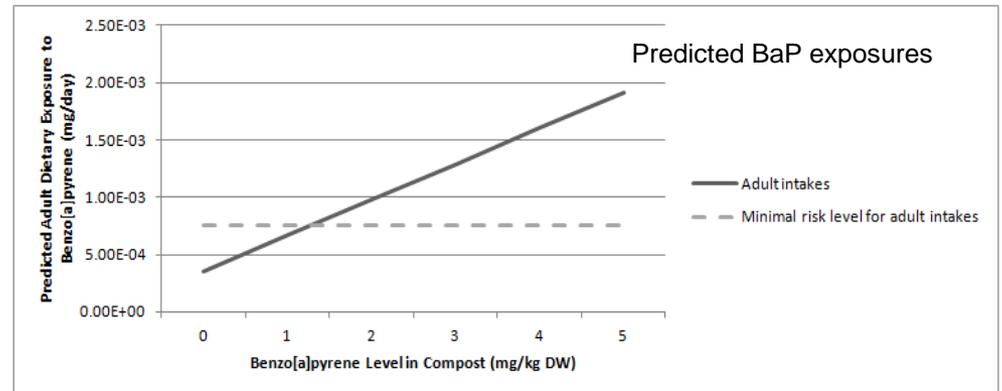
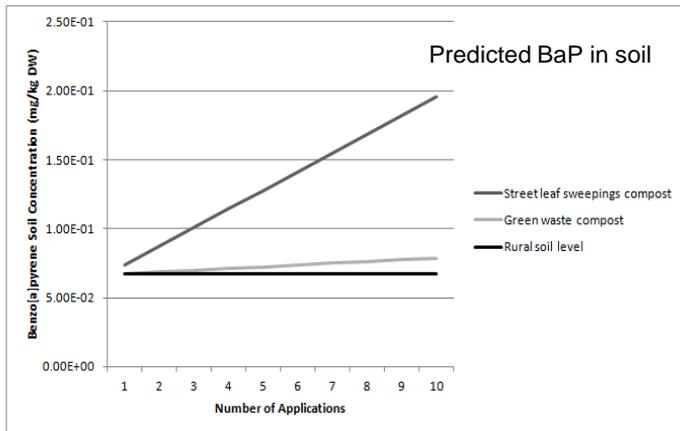


Contribution (%) to adult and infant intakes by produce



Applications for WALTER

- ➔ To support screening for low risk activities
- ➔ To better understand conceptual model including pathways (e.g. arable versus pasture) and other assumptions (e.g. the exposed population)
- ➔ To evaluate emerging issues including chemicals (e.g. PFOS, synthetic musks, PBDEs) and waste streams (e.g. street leaf sweepings)



Concluding Remarks

- ➔ Recovery of waste is critical to a circular economy
- ➔ We want recovery without harm to protect our soils and provide food security
- ➔ We are working with other agencies and academic institutions to better understand the hazards and risks, providing robust and proportionate tools to support regulatory decisions
- ➔ Thank you for your attention

Contact me for further information on any of the work mentioned here

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