



Healthy food packaging: Human health and environmental concerns.

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Top 10 Items Collected



1. CIGARETTE BUTTS
2,127,565



6. OTHER PLASTIC BAGS
424,934



2. PLASTIC BEVERAGE BOTTLES
1,024,470



7. GLASS BEVERAGE BOTTLES
402,375



3. FOOD WRAPPERS
888,589



8. PLASTIC GROCERY BAGS
402,122



4. PLASTIC BOTTLE CAPS
861,340



9. METAL BOTTLE CAPS
381,669



5. STRAWS, STIRRERS
439,571



10. PLASTIC LIDS
351,585



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“SAFE”

no untested chemicals
and no hazardous chemicals

Hazardous chemicals are in food packaging – and they migrate.

Food safety

Chemicals leaching into food from packaging raise safety concerns

Scientists, in BMJ paper, warn of potential long-term damage of exposure to synthetics, including formaldehyde in drinks bottles



📷 Packaged burger and chips. Synthetic chemicals in packaging include phthalates, known to disrupt hormone production. Photograph: Martin Godwin for the Guardian

Sarah Boseley, health editor

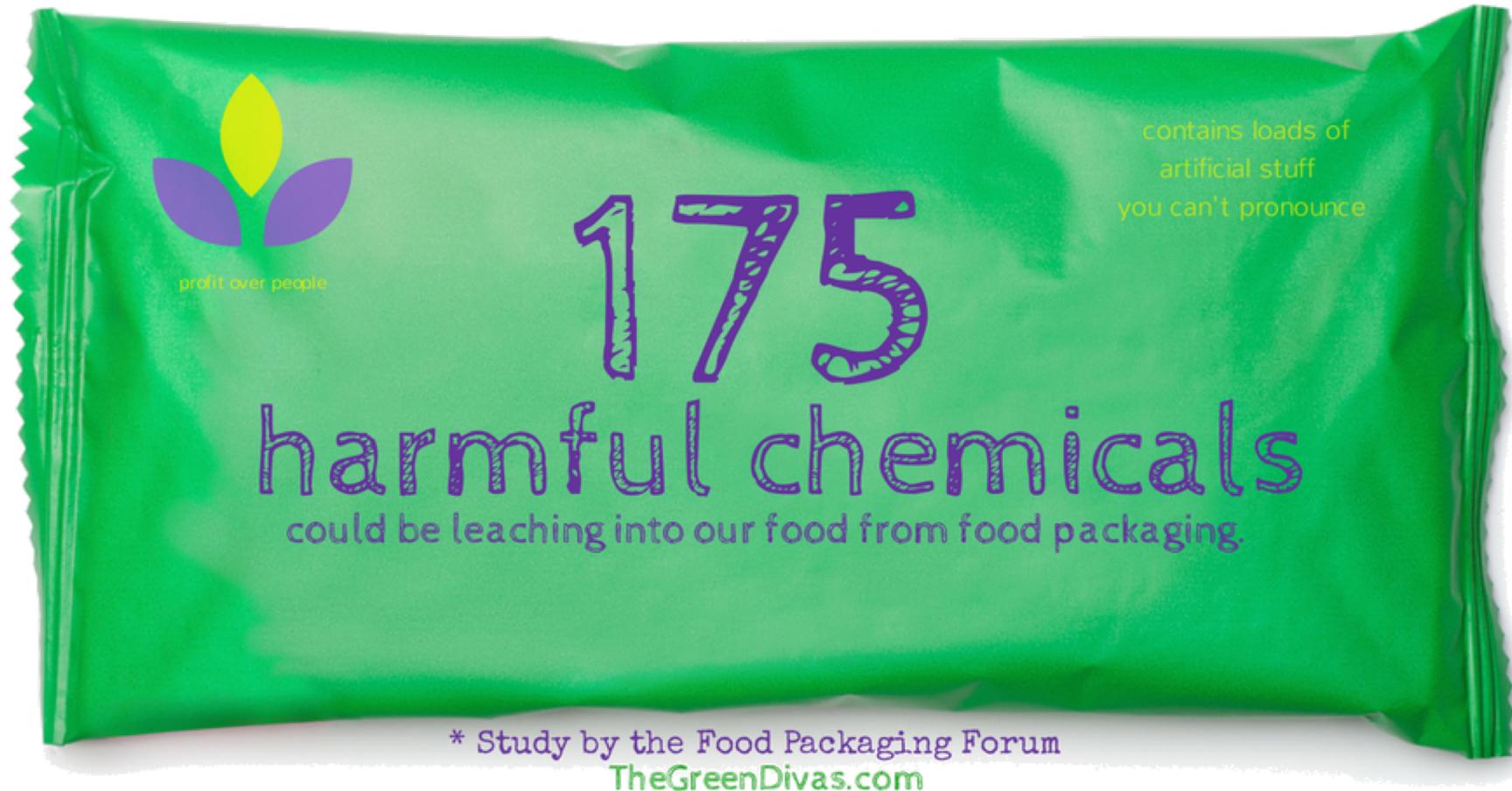
Wednesday 19 February 2014 00.01 GMT

Advertisement

Muncke, J., et al. (2014). "Food packaging and migration of food contact materials: will epidemiologists rise to the neotoxic challenge?" Journal of Epidemiology and Community Health **68(7)**: 592.

<http://www.theguardian.com/world/2014/feb/19/chemicals-leaching-food-packaging-safety-bmj>





Geueke, B., et al. (2014). "Food contact substances and chemicals of concern: a comparison of inventories." Food Additives & Contaminants: Part A **31**(8): 1438-1450.

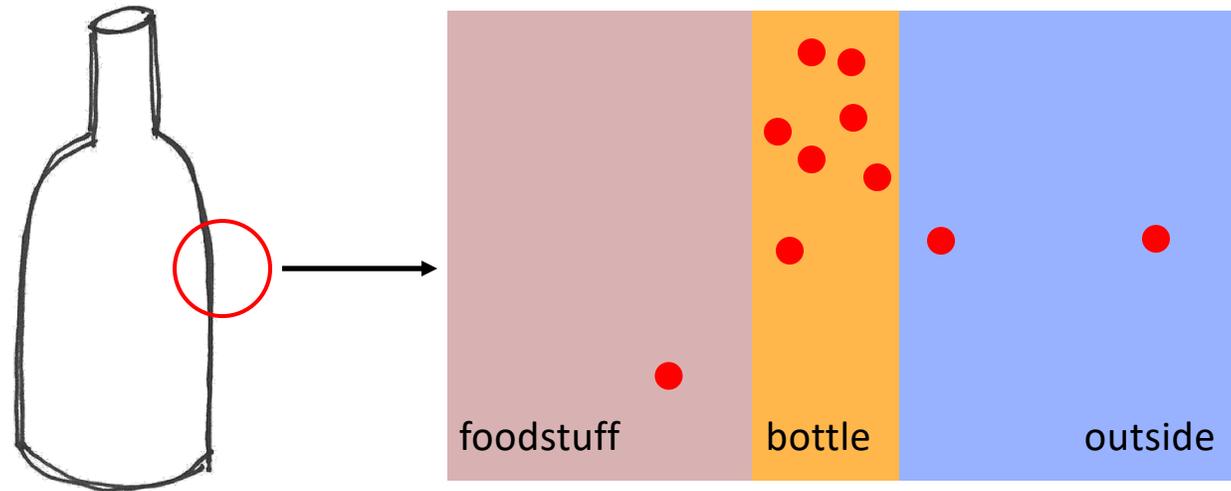
Food Contact Chemicals database (FCCdb)

**Coming
soon!**



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Migration: chemicals transfer into food



heat higher temperature increases leaching

time long storage time increases leaching

food chemistry fatty foods, acidic foods, aqueous foods: **it depends on food stuff what chemicals migrate from the packaging**

packaging size smaller packaging has proportionally larger surface area, more migration per volume of food

levels in the packaging higher levels of a chemical in packaging can lead to higher migration





FCM are an underestimated source of food contamination

	Pesticides	FCMs
Number of Substances	~1500	Possibly 100,000
Level of food contamination	µg/kg	mg/kg
Toxicological evaluation	yes	mostly no

2

Source: presentation by Dr. Gregor McCombie, Official Food Control Authority Zurich. 26 January 2016, [EU Parliament workshop](#)..





 **Institute of Packaging Professionals**

Welcome to FSAP

FSAP is the **Food Safety Alliance for Packaging**, a technical committee of the [Institute of Packaging Professionals](#).

FSAP is a group of individuals from food companies and the food packaging supply chain dedicated to raising **food quality and safety awareness for the food packaging industry**.

FSAP discusses food packaging topics during a bi-monthly call. In addition, there is a yearly face-to-face meeting.

- [FSAP Interim By-Laws \(June2018\)](#)

The FSAP brand owners' working group has published the document: [Food Packaging Product Stewardship Considerations](#) The working group aims to provide a list of product stewardship best practices in a publicly available document for all of the food packaging supply chain to access. For this document, input was given by brand owners including Nestlé and Mars Wrigley Confectionery and packaging supply chain members including, Decernis, Siegwark, American Packaging Corp., Henkel and Sun Chemical.

Food companies and members of the packaging supply chain are welcome to use all or parts of this non-binding document as a roadmap for product stewardship considerations.

 A technical committee of:



OFF-FLAVOR AND OFF-odors are a huge concern to the consumer and Consumer Food Packaging Companies which packaging can effect. Be sure to understand the impact of your process and upstream inputs.

A MAJOR CONTRIBUTOR of recalls is due to mixed copy and allergens in the marketplace

Food Packaging Product Stewardship Considerations:
 “a best practice for the formulation of food packaging for consumer products”

id=2263

https://www.iopp.org/files/Food%20Packaging%20Product%20Stewardship%20Considerations%20FSAP-IoPP%20v1_0.pdf

Packaging part/component	Substance(s) / Topic(s)	Description	Should not use intentionally (where suitable alternatives exist)	Minimize Use	Additional Information/ references
Grease-proof coated paper and board	Perfluoro and polyfluoro compounds:				
	- C8 and higher (PFOA and related)	- Must not be used.	X		Not allowed by US-FDA
	- C6 polyfluoro, C2 perfluoro ethers and other polyfluoro and perfluoro compounds	- Can be used but consider alternatives if available.		X	Consumer interest

Food processing increases
hazardous chemicals in food.



Food processing is a source of hazardous chemicals in food

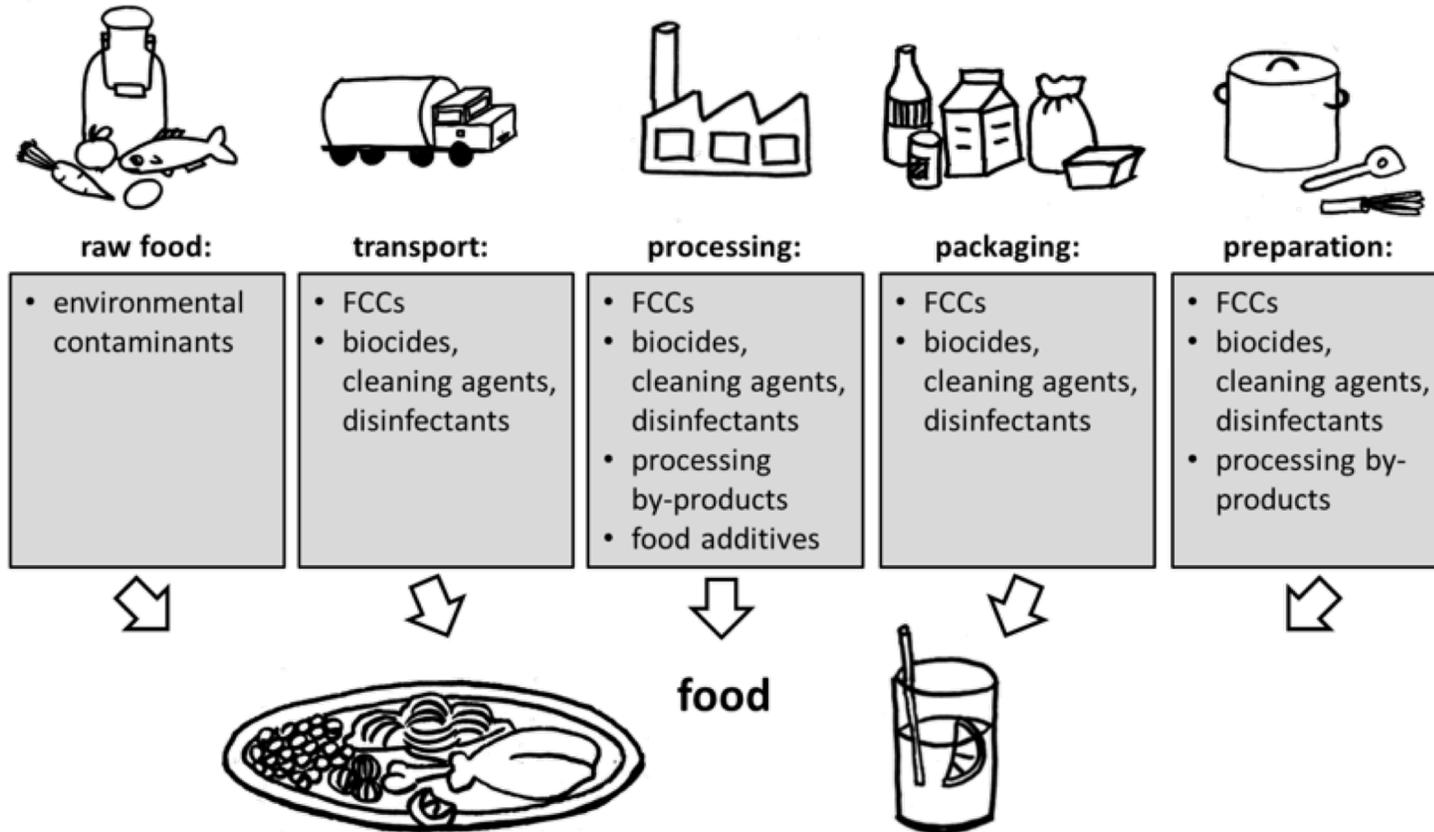


Figure S1. Overview of unintentional chemical inputs into the food value chain during different stages. Chemical contaminants can also be formed in food during (domestic) cooking.

Muncke et al. 2017, Scientific challenges in the risk assessment of food contact materials. EHP. Supplemental Material.

Varshavsky, Julia R., et al. 2018. Dietary sources of cumulative phthalates exposure among the U.S. general population in NHANES 2005–2014. Environment International.

Susmann et al. 2019. Dietary Habits related to Food Packaging and Population exposure to PFAS. EHP.

Dietary intervention study: set-up

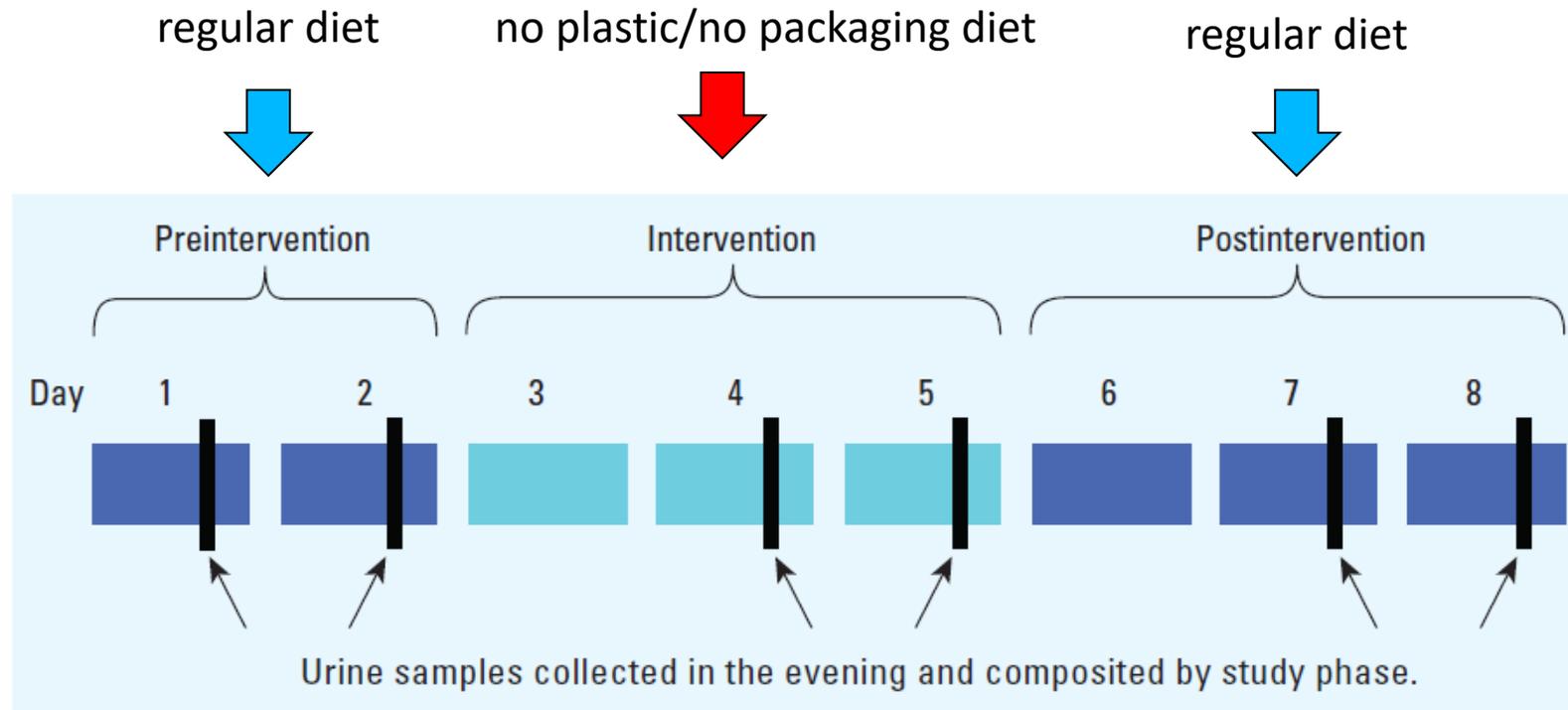
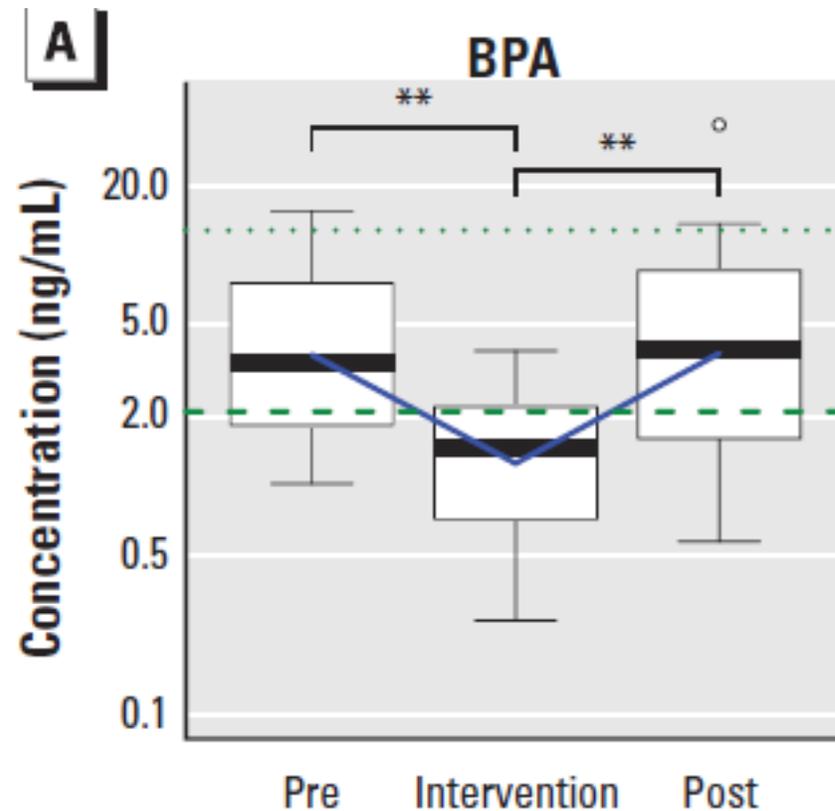


Figure 1. Intervention study design ($n = 20$ individuals from five families). Each participant provided a total of six urine samples (arrows; two per phase). Paired samples collected from each individual during each phase were combined for analysis.



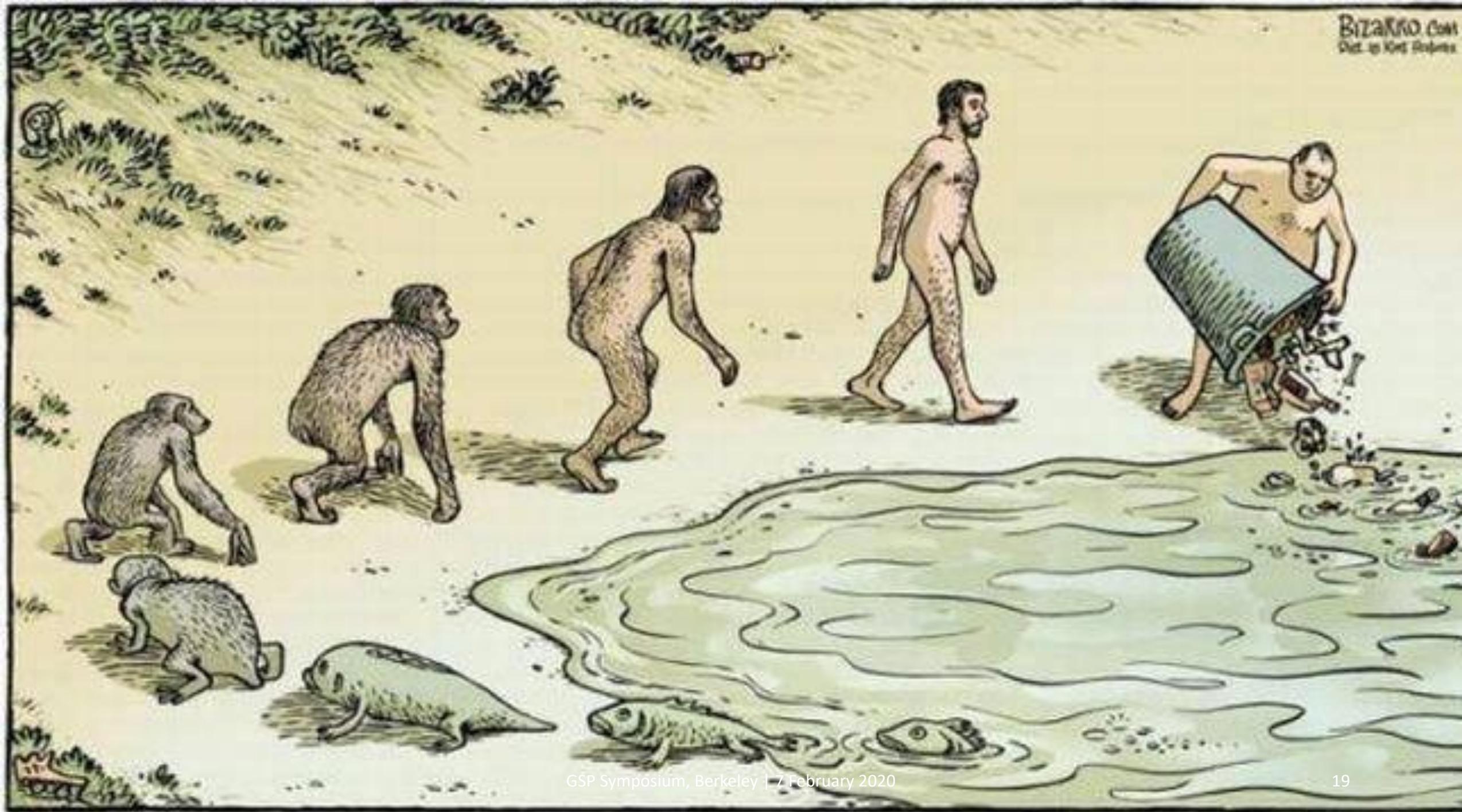
Dietary intervention study: results BPA



Rudel et al. 2011 Environmental Health Perspectives 119(7):914-20

Solutions must protect human
health and the environment.





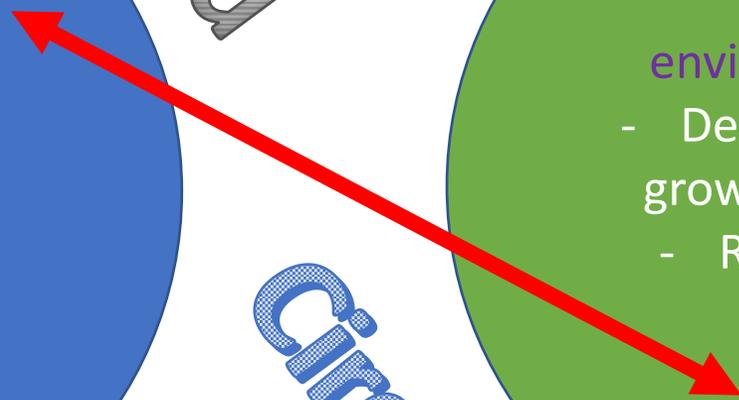
Two disconnected worlds...

Food Contact World

- **Chemical safety**
- Migration
- Extend shelf life
- Lightweight
- New materials
- Marketing

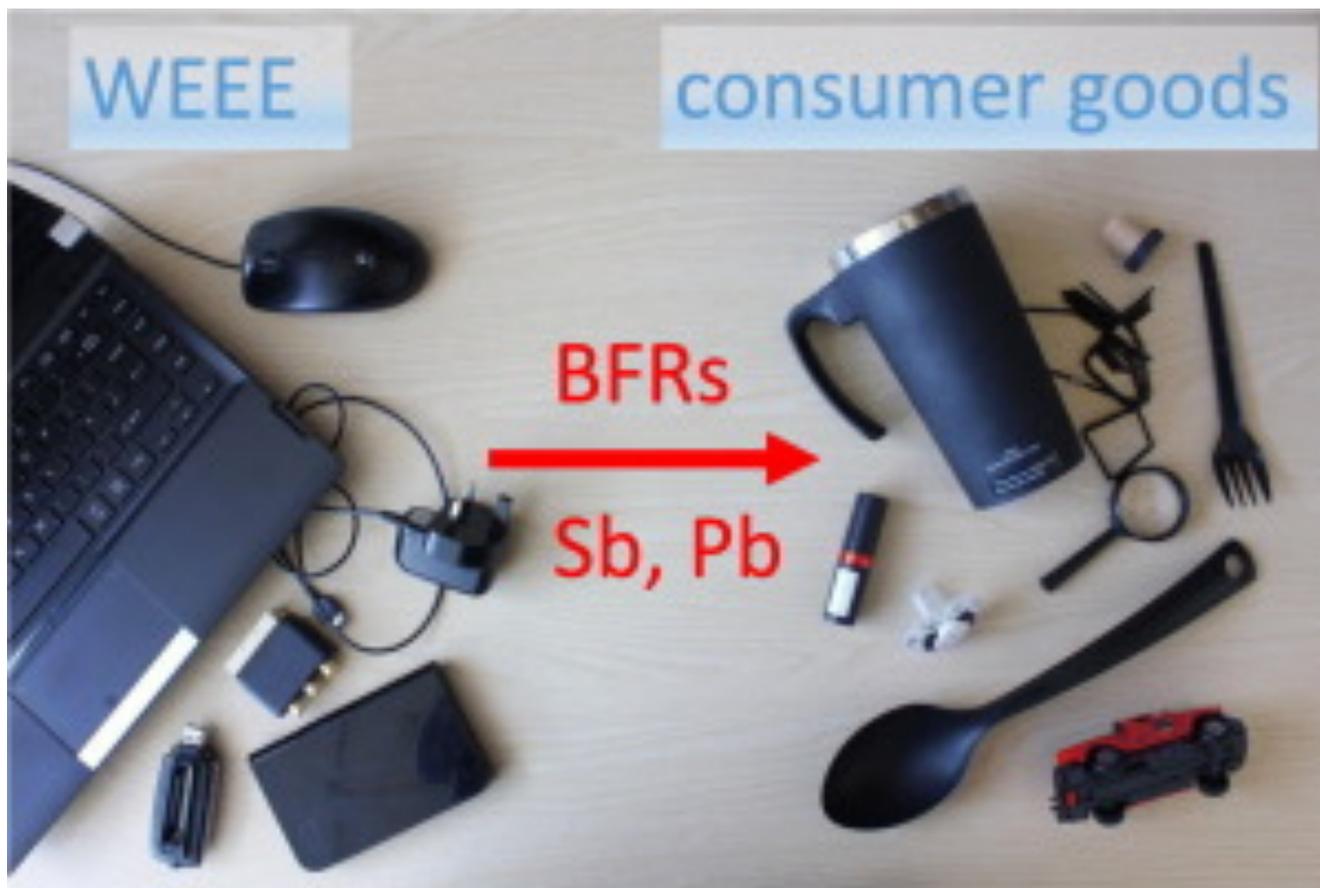
Circular Economy World

- Reduce resources and energy loss: **environmental issues**
- Decouple economic growth, consumption
- Reuse and recycle food packaging
- **No focus on chemical safety**



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(Black) plastics made with recycled plastic



Source: A. Turner, 2018

Samsonek, J., and F. Puype 2013 Occurrence of brominated flame retardants in black thermo cups and selected kitchen utensils purchased on the European market. *Food Additives & Contaminants: Part A* 30(11):1976-1986.

<https://www.tandfonline.com/doi/abs/10.1080/19440049.2013.829246>

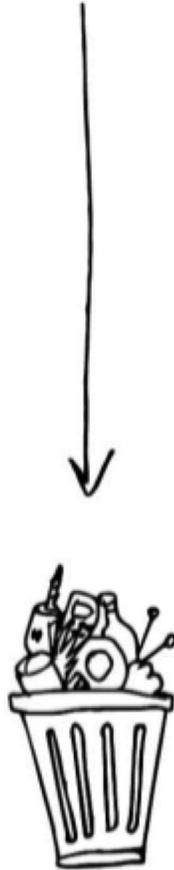
Rani, Manviri, et al. 2014 Hexabromocyclododecane in polystyrene based consumer products: An evidence of unregulated use. *Chemosphere* 110:111-119.

<https://www.sciencedirect.com/science/article/pii/S0045653514002252?via%3Dihub>

Turner, Andrew 2018 Black plastics: Linear and circular economies, hazardous additives and marine pollution. *Environment International* 117:308-318.

<https://www.sciencedirect.com/science/article/pii/S0160412018302125?via%3Dihub>

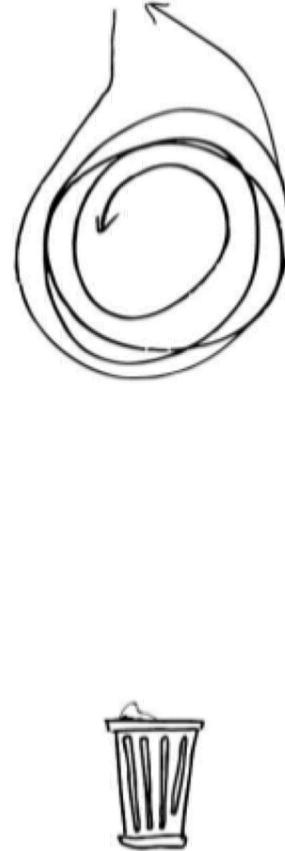
LINEAR ECONOMY



RECYCLING ECONOMY



CIRCULAR ECONOMY



Conclusions

1. Hazardous chemicals are present in food packaging. **Regulations and enforcement are insufficient.** Companies are making their own policies and NGOs are raising awareness for the issue.
2. Getting hazardous chemicals out of food packaging is an important task **but other sources “upstream” in food processing are also important.** Eating homemade, non-processed foods is important for reducing personal exposure to hazardous chemicals.
3. Food contact articles are a source of hazardous chemicals. **But packaging waste is also a major challenge and concern.** Solutions to plastic pollution and packaging waste’s end of life must address both human health and environmental concerns.



Food Packaging Forum (FPF) Foundation



Science communication & scientific research (desk-based)



Food contact materials, chemicals, migration, human health



2012 in Zurich



Scientists & science communication experts



Donations and project-based funding, incl. BA Glass, Verallia



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BACKGROUND
ARTICLES

DOSSIERS

SCIENTIFIC
PUBLICATIONS



ALL INFORMATION FREELY
AVAILABLE:
www.foodpackagingforum.org



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THANK YOU – and please save the date!

- **October 22, 2020**
- FPF workshop: science-policy interface – **a stakeholder dialogue**
- Join us for one day of **critical thinking** and **beyond-comfort-zone networking**: meet people you'd NEVER interact with!
- Learn about **chemicals in food contact** articles and **health impacts**
- Join **cutting-edge discussions** on a way forward, learn about the **newest science** and get **inspired!**
- Alternatively: join by **webstream**

<https://www.foodpackagingforum.org/events/categories/workshops>

