
BRS COP - MONDAY 1st MAY, 2023
19:15 – 20:45 CEST
Room 3
IPEN SIDE EVENT
WHY LOW POPs CONTENT LEVEL MATTERS
Visit us online for IPEN's research, policy analysis, and more on chemicals, waste, and threats to our health and the environment
https://ipen.org
IPEN
for a toxics-free future

BRS COP - MONDAY 1st MAY, 2023

19:15 – 20:45 CEST
Room 3

IPEN SIDE EVENT

WHY LOW POPs CONTENT LEVEL MATTERS

Visit us online for IPEN's research, policy analysis, and more on chemicals, waste, and threats to our health and the environment

https://ipen.org

IPEN
for a toxics-free future

SPEAKERS

Jindrich PETRLIK

Farida AMUTOVA

Roland WEBER

Serge Molly ALLO'O ALLO'O

Lee BELL

Why Low POPs Content Level Matters
A summary of the latest studies

Side event “Why Low POPs Content Level Matters “

Geneva – 1 May 2023

RNDr. Jindřich Petrlík

Arnika Association / IPEN expert on dioxin and POPs waste

Incinerator fly ash – losing control with many uses (allowed due to weak POPs limits)

Roads and sidewalks

Construction products

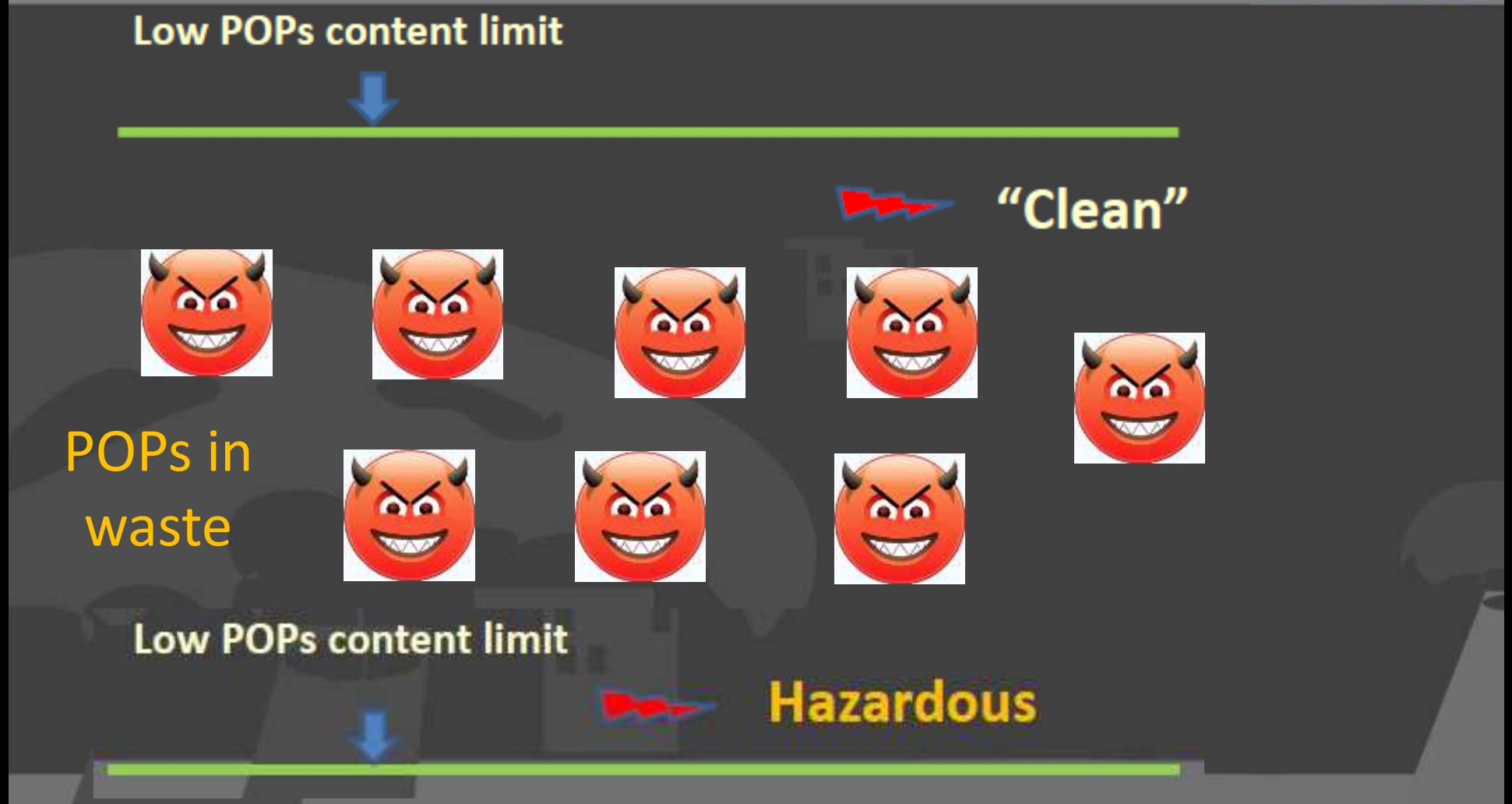
Cover layer at municipal landfills

Embankments

(Agriculture)

Recycling of POPs violates the Stockholm Convention

Wastes and POPs content limit values



Dioxins & Planetary Boundaries

7 KG OF DIOXINS
(ANNUAL POLLUTION ALOWED BY PROPOSED LIMITS)

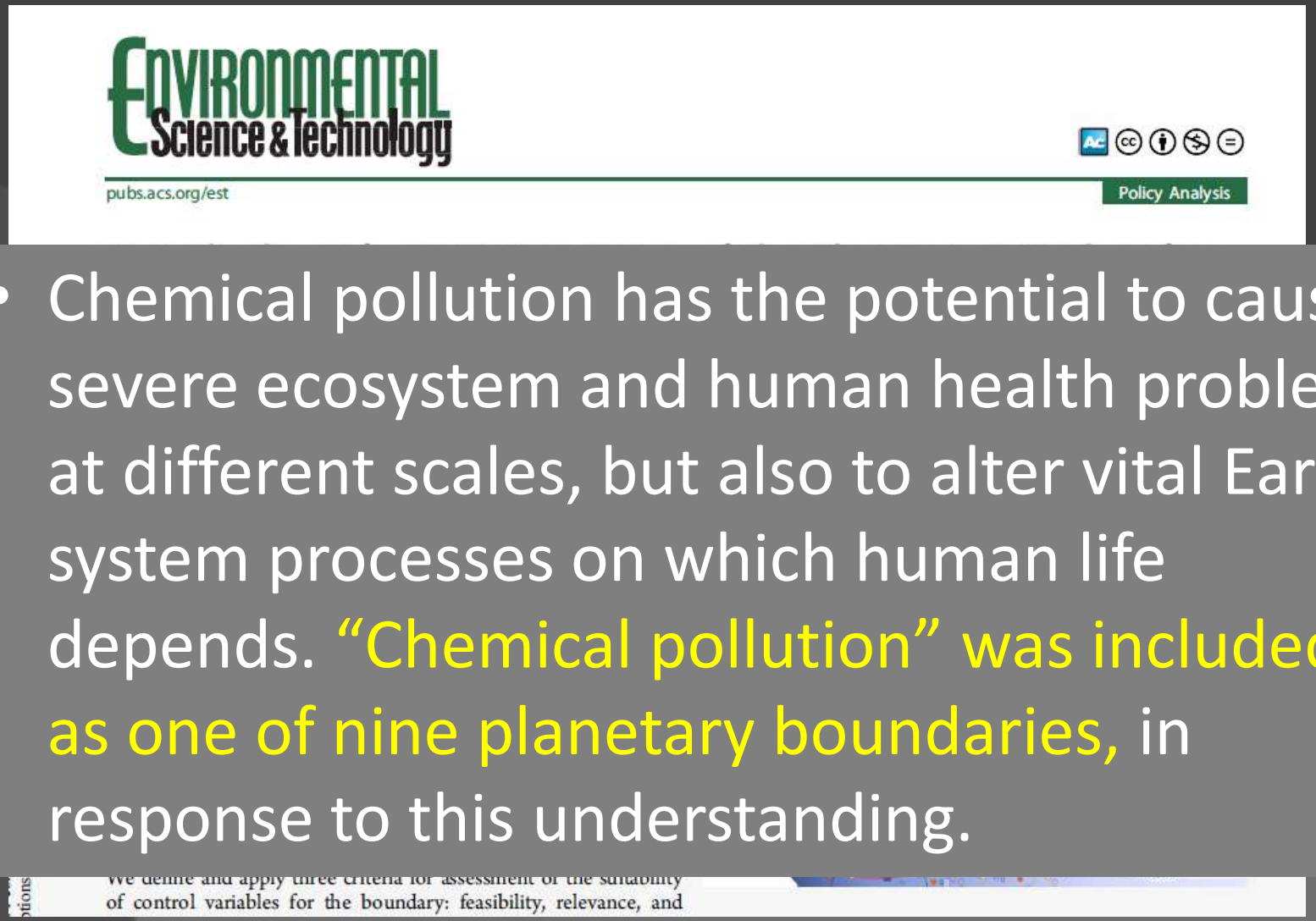
=

133x TOLERABLE INTAKE FOR THE ENTIRE PLANET

STOP DIOXIN CONTAMINATION OF OUR FOOD CHAIN

DEMAND A STRICT LIMIT FOR DIOXINS IN WASTE: 0.001 MG TEQ/KG

Chemical pollution reached planetary boundary



- Chemical pollution has the potential to cause severe ecosystem and human health problems at different scales, but also to alter vital Earth system processes on which human life depends. "Chemical pollution" was included as one of nine planetary boundaries, in response to this understanding.

Dioxins and PCBs in eggs

New scientific study:

Dioxin pollution is not a thing of the past.

Almost 90% of the areas surveyed around the world were not safe for the production of free-range eggs.

IPEN
a toxics-free future

MCON.2022.05.001

HAZARDOUS CHEMICALS IN PLASTIC PRODUCTS

BROMINATED FLAME RETARDANTS IN CONSUMER PRODUCTS MADE OF RECYCLED PLASTIC FROM ELEVEN ARABIC AND AFRICAN COUNTRIES

May 2022

ARNIKA

IPEN
for a toxics-free future

Health costs of recycling POPs

Chemosphere 294 (2022) 133774

Contents lists available at ScienceDirect

Chemosphere

journal homepage: www.elsevier.com/locate/chemosphere

Migration of hazardous contaminants from WEEE contaminated polymeric toy material by mouthing

Sicco H. Brandsma [a, *], Pim E.G. Leonards [a], Jacco C. Koekkoek [a], Jiří Samsonek [b], Franky Puype [b]

[a] Department of Environment and Health, Vrije Universiteit, Amsterdam, De Boelelaan 1085, 1081HV, Amsterdam, the Netherlands
[b] Institute for Testing and Certification, Inc., Trida Tomase Bati 299, Louky, 76302, Zlin, Czech Republic

HIGHLIGHTS

- Saliva migration study on chemical mixtures in WEEE contaminated toys.
- Up to 11 additives were found in saliva after 1 h mouthing a WEEE contaminated toy.
- 246-TBP, TBBPA, BPA, TPHP, DEHP, and DIBP were predominantly detected in saliva.
- The highest estimated daily intake was found for BPA followed by DEHP, DIBP, TBBPA.
- 246-TBP migrates in correspondence to the presence of TTBP-TAZ.

GRAPHICAL ABSTRACT

Health costs of recycling POPs

Chemosphere 251 (2020) 126579

Contents lists available at ScienceDirect

Chemosphere

journal homepage: www.elsevier.com/locate/chemosphere

Detection of high PBDD/Fs levels and dioxin-like activity in toys using a combination of GC-HRMS, rat-based and human-based DR CALUX® reporter gene assays

Clémence Budin [a, b, *], Jindrich Petrlik [c], Jitka Strakova [c], Stephan Hamm [d], Bjorn Beeler [e], Peter Behnisch [b], Harrie Besselink [b], Bart van der Burg [a], Abraham Brouwer [a, b]

[a] VU Amsterdam, Faculty of Sciences, Department of Animal Ecology, De Boelelaan, 1080HV, Amsterdam, the Netherlands
[b] BioDetection Systems B.V., Science Park 406, 1098XH, Amsterdam, the Netherlands
[c] Arnika – Toxics and Waste Programme, Delnicka 13, Prague, Czech Republic
[d] Mas Münsteranalytical solutions gmbh, Wilhelm-Schickard-Strasse 5, 48149, Münster, Germany
[e] IPEN, Gothenburg, Sweden

HIGHLIGHTS

- We determined DR CALUX and DR_{human} CALUX REP values for PBDD/Fs.
- In sampled plastic toys, we measured high levels of PBDD/Fs using GC-HRMS.
- GC-HRMS-based TEQ calculated using PCDD/F TEF were up to 3821 pg TEQ/g.
- Bioassay equivalents up to 2550 pg TEQ/g were measured by DR CALUX® bioassays.
- Mouthing of contaminated plastics may significantly contribute to dioxins TDI.

Health costs of recycling POPs

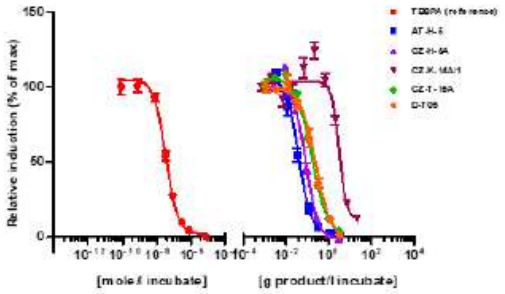
Dioxin- and thyroid hormone-like in vitro effects

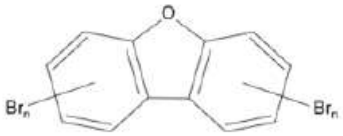
Known and unknown BFRs

26 different countries on four continents (Africa, America, Asia and Europe)

DR and TTR-TRβ CALUX

GC-HRMS and GC-MS-NICI





Health costs of recycling POPs

Environment International

Global survey of dioxin- and thyroid hormone-like activities in consumer products and toys

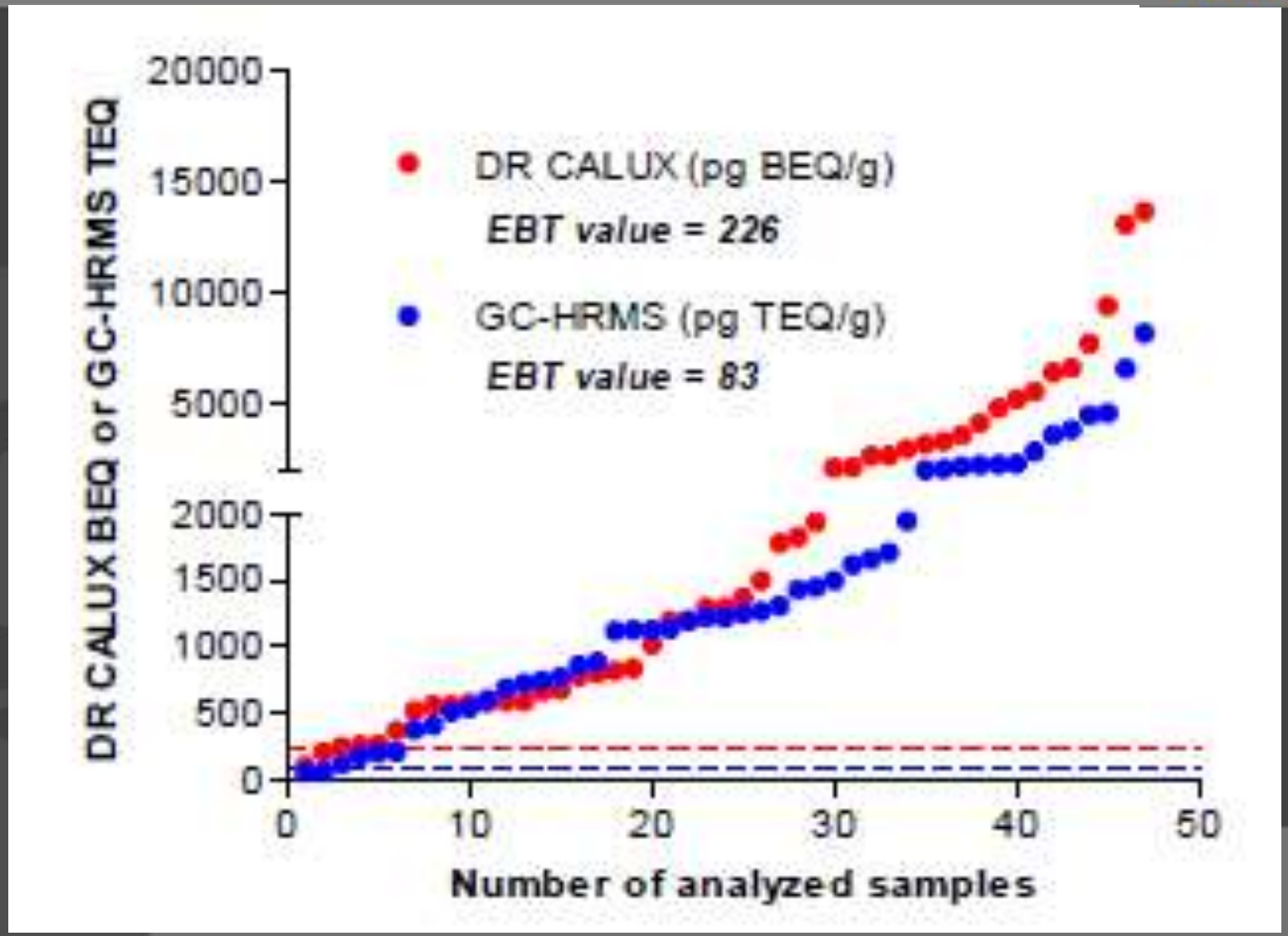
Consumer products, mainly toys, kitchen utensils, hair accessories etc. made of e-waste plastics **from 26 countries**, on four continents (Africa, America, Asia and Europe)

More than 60% contained dioxin levels above 1 ng TEQ/g (proposed for LPCL) measured by both GC-HRMS and DR CALUX$_{human}$

PBDD/Fs up to 17,000 pg BEQ/g (DR CALUX$_{human}$) and 13,900 pg WHO-TEQ/g (GC-HRMS)

High TBBPA levels measured by TTR-TRβ CALUX (max 410 mg/kg) and by chemical analysis (max 836 mg/kg)

Health costs of recycling POPs



Health costs of recycling POPs

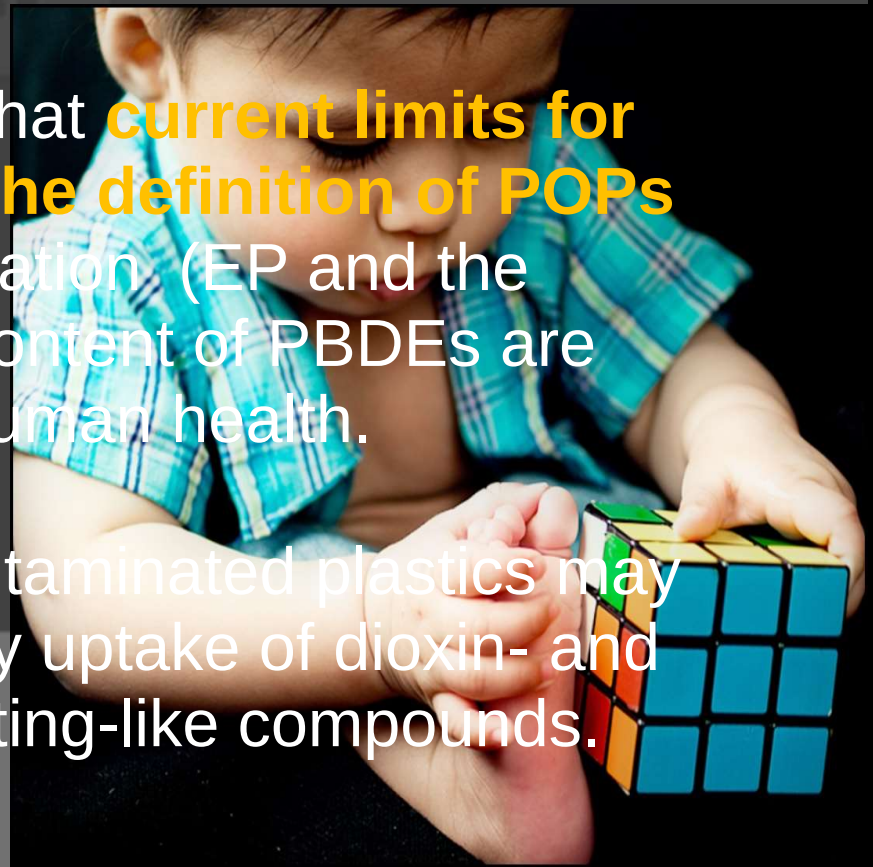
Environment International

Global survey of dioxin- and thyroid hormone-like activities in consumer products and toys

High TBBPA levels measured by TTR-TRβ CALUX (max 410 mg/kg) and by chemical analysis (max 836 mg/kg)

This study add further evidence that **current limits for both trace contamination and the definition of POPs waste** set in the EU POPs Regulation (EP and the Council, 2019) and for the total content of PBDEs are **too weak** (500 ppm) to protect human health.

Mouthing by toddlers of such contaminated plastics may significantly contribute to the daily uptake of dioxin- and thyroid hormone transport disrupting-like compounds.



Health costs of recycling POPs

Toy car from Kenya 13090 pg BEQ/g DR CALUX; 6590 pg WHO-TEQ/g PBDD/Fs (GC-MS)

Noodle scoop; Tanzania 800 pg BEQ/g DR CALUX; 210 pg WHO-TEQ/g PBDD/Fs (GC-MS)


ARNIKA

Economic implications of limits for POPs in waste are treated unequally

POPs waste limits

- Only strong limits for POPs – Low POPs Content Levels can solve the situation and stop the flow of POPs into recycling chain!
- 50 mg/kg for PBDEs
- 100 mg/kg for HBCD
- 0.001 mg TEQ/kg for PCDD/Fs + dl PCBs
- 100 mg/kg for SCCPs
- 0.025 mg/kg for listed PFASs and 10 mg/kg for PFASs and related compounds

Děkuji - Thank you – Merci - Gracias - شكرًا لك - 谢谢 - Спасибо - Tack - ありがとうございました - ขอบคุณครับ

Jindrich Petrlik & Jitka Strakova / Arnika / IPEN

jindrich.petrlik@arnika.org

http://www.ipen.org
http://english.arnika.org

BRS COP - MONDAY 1st MAY, 2023

19:15 – 20:45 CEST
Room 3

IPEN SIDE EVENT

WHY LOW POPs CONTENT LEVEL MATTERS

Visit us online for IPEN's research, policy analysis, and more on chemicals, waste, and threats to our health and the environment

https://ipen.org

IPEN
for a toxics-free future

SPEAKERS

Jindrich PETRLIK

Farida AMUTOVA

Roland WEBER

Serge Molly ALLO'O ALLO'O

Lee BELL

Meetings of the conferences of the Parties to the Basel, Rotterdam and Stockholm conventions in 2023

Transfer of persistent organic pollutants in food of animal origin

Farida AMUTOVA

PhD in agricultural sciences,
Head of the laboratory for Physical and Chemical Methods of Research,
Scientific and Production Enterprise Antigen LTD

Geneva, Switzerland
1st of May 2023

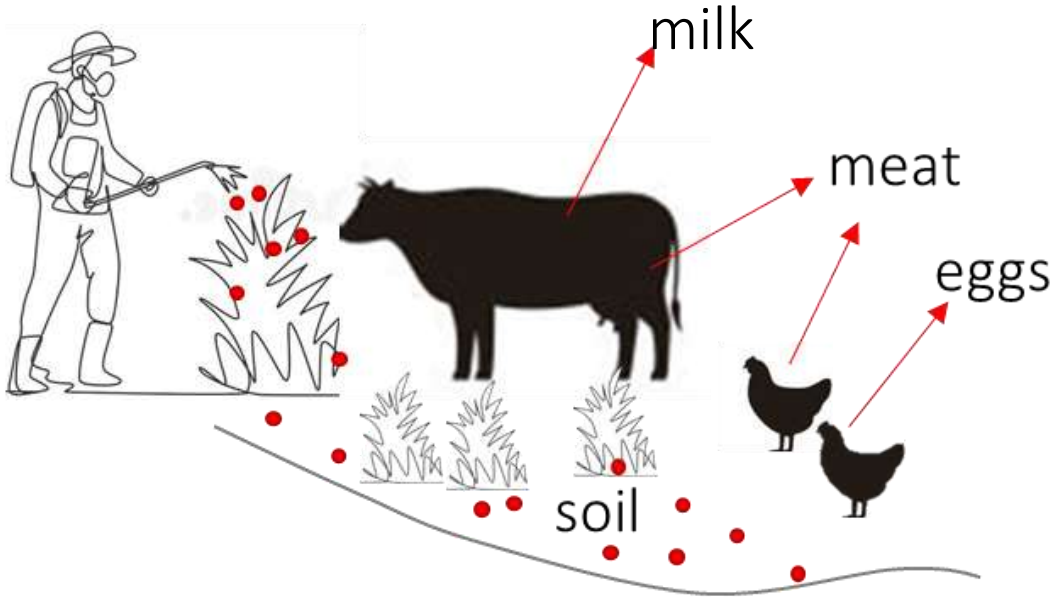
https://www.researchgate.net/profile/Farida-Amutova

Persistent organic pollutants (POPs)

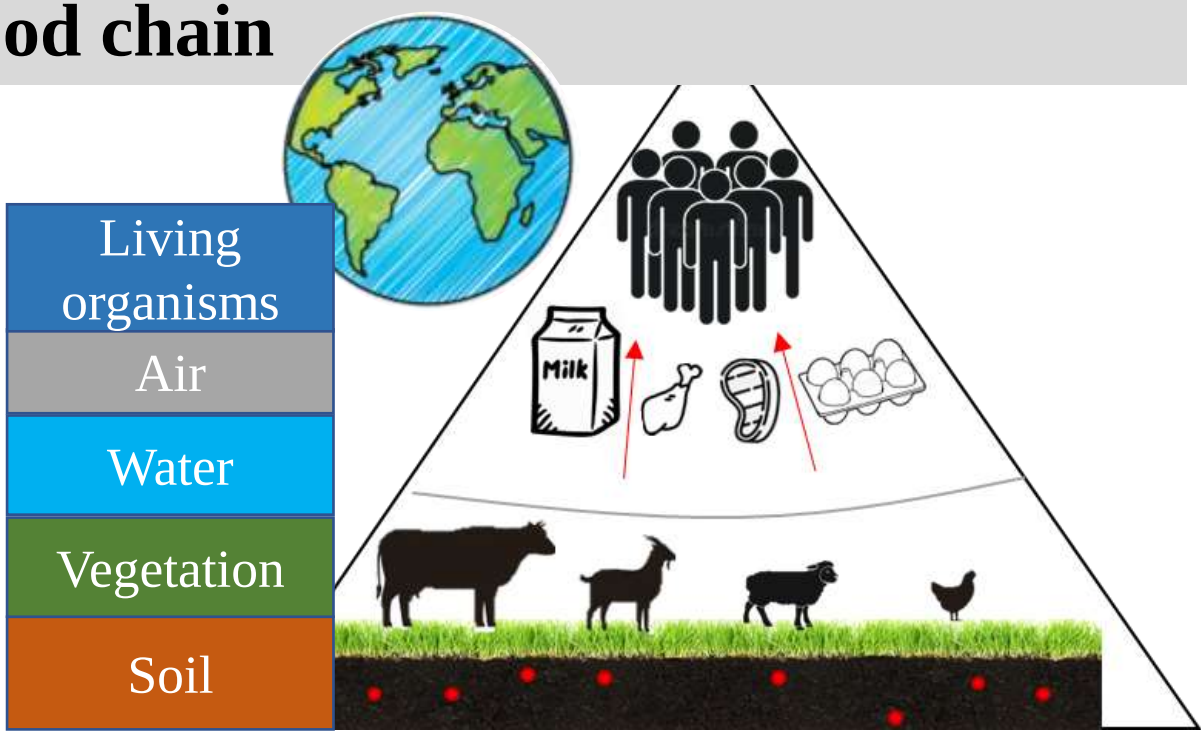
Highly toxic substances

High stability in environment (soil)

Easily bioaccumulated



Widely spread in environment and food chain



International Agency for Research on Cancer (IARC)
US Environmental Protection Agency (EPA)
Agency for Toxic Substances and Disease Registry (ATSDR)

Persistent organic pollutants (POPs)

Stockholm Convention, 17 May 2004

Agrochemicals (OCPs)

DDT, Aldrin, Dieldrin, Endrin, Chlordecone, Heptachlor, Toxaphene, Mirex, Lindane, Hexachlorbenzene

Industrial chemicals

Polychlorobyphenyls (PCBs)
Hexachlorobenzene
Brominated compounds

Unintentionally generated by-products

Dioxins and Furans (PCDD/Fs)

- Environmental contaminants (PCDD/Fs, OCPs, PCBs) can be stored during decades in soil = a powerful reservoir
- All free ranged food producing animals ingest soil at different levels
- Therefore, soil is one of the main vector for contaminants in animals and then in food

Livestock daily soil ingestion

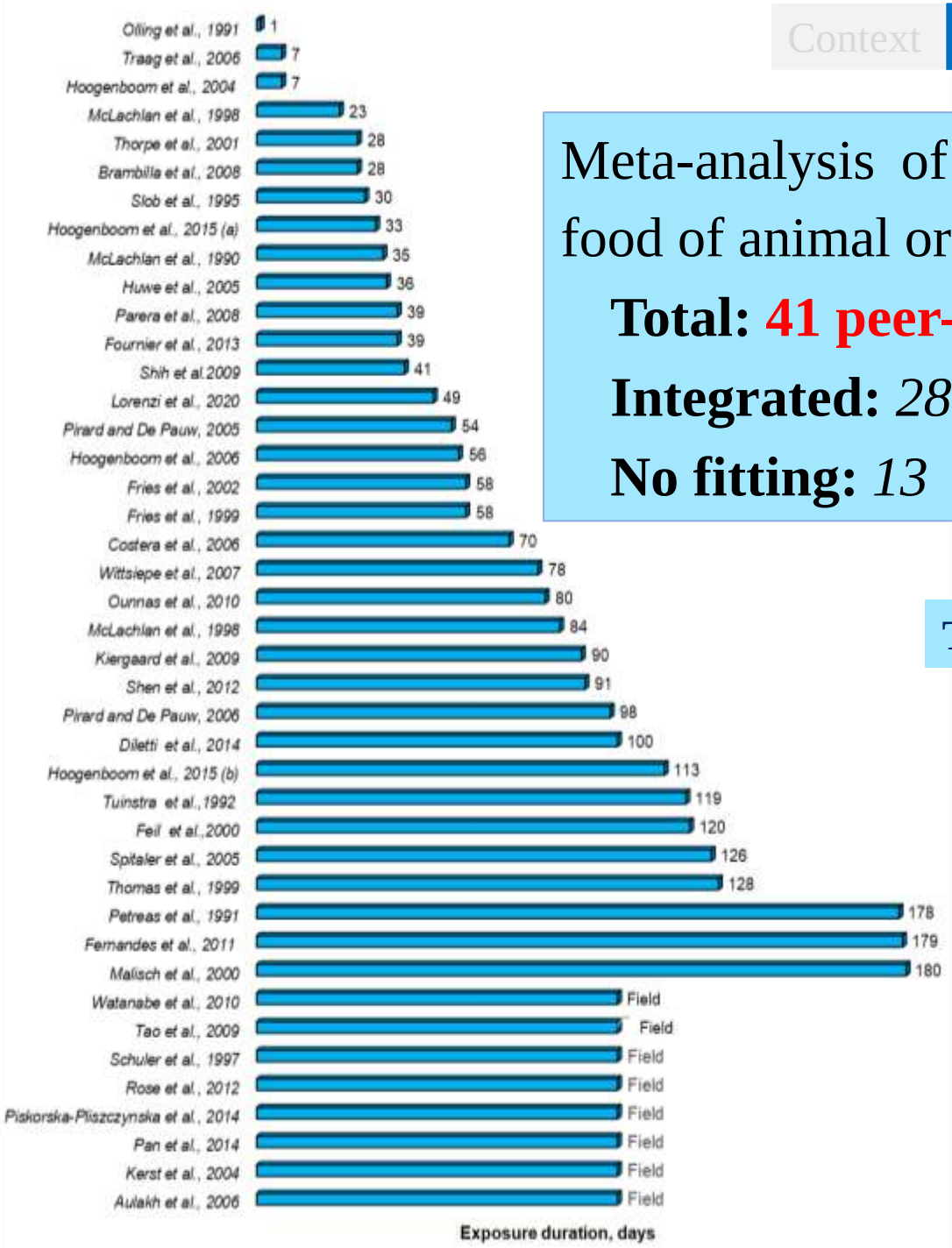
Ruminants	Soil DM kg/day	Consumption,%	Conditions	Source
Dairy cows	0.88	Up to 10%	winter period	Healy, 1968
	0.85		intensive grazing during wet autumn	Jurjanz et al., 2012
Growing cattle (160 kg BW)	0,10	-	Tropical post tethering	Collas et al., 2019
Sheep	0.2	Up to 30%	normal grazing	Healy & Ludwig, 1965
	1.0		winter-spring grazing period	McDonald et al., 1995, Abrahams et al., 2003 Thornton, 1983
Laying hens (3,5 kg BW)	0,032	Up to 23	unbalanced feeding	J. van der Meulen et al., 2006 Jondreville et al., 2010

Aim of the study

Estimation the transfer of POPs into food of animal origin using summarizing published knowledge on POP transfer by a meta-analysis

These outcomes could be used to assess the risk and, if necessary, to manage using a remediation strategy to limit their transfer.

Amutova F., *Delannoy M., Baubekova A., Konuspayeva G., Jurjanz S.*
Transfer of persistent organic pollutants in food of animal origin - Meta-analysis of published data.
Chemosphere. ***2021****. DOI: 10.1016/j.chemosphere.2020.128351*



Meta-analysis of reported transfer data of PCDD/Fs, PCBs, OCPs to food of animal origin (milk, eggs, and edible tissues as liver, muscles and adipose fat)

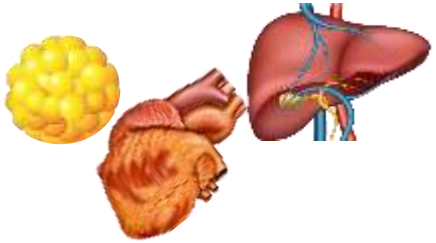
Total: 41 peer-reviewed articles

Integrated: *28 (**20** – PCDD/Fs, **12** – PCBs, **3** – OCPs, **1** – PBDEs)*

No fitting: *13*

Transfer rate (TR)

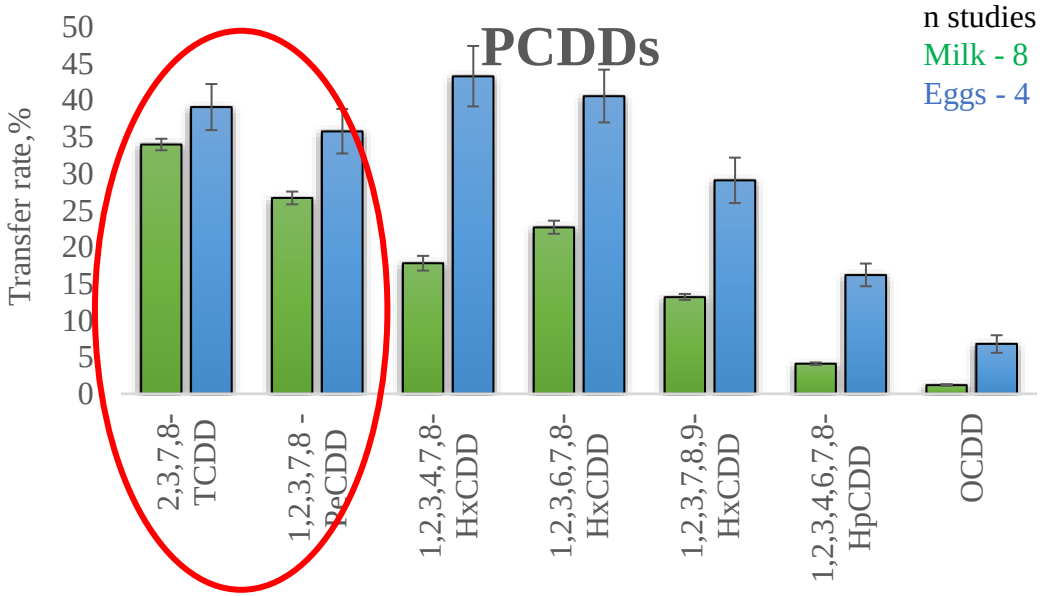
Bioconcentration factor (BCF)

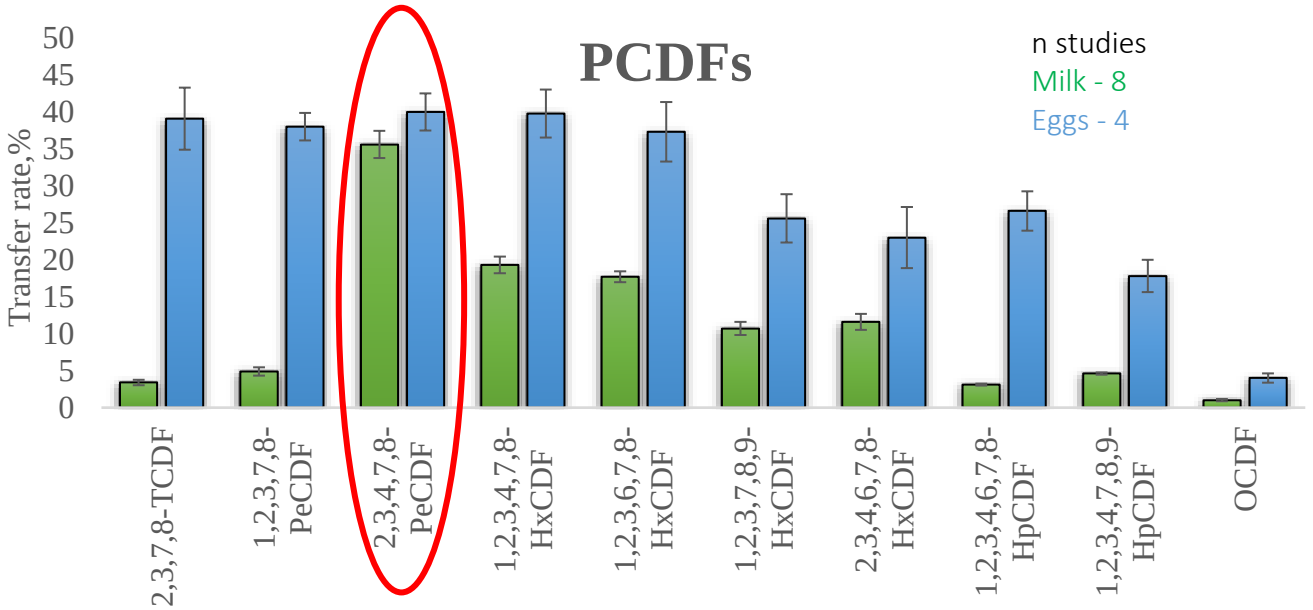


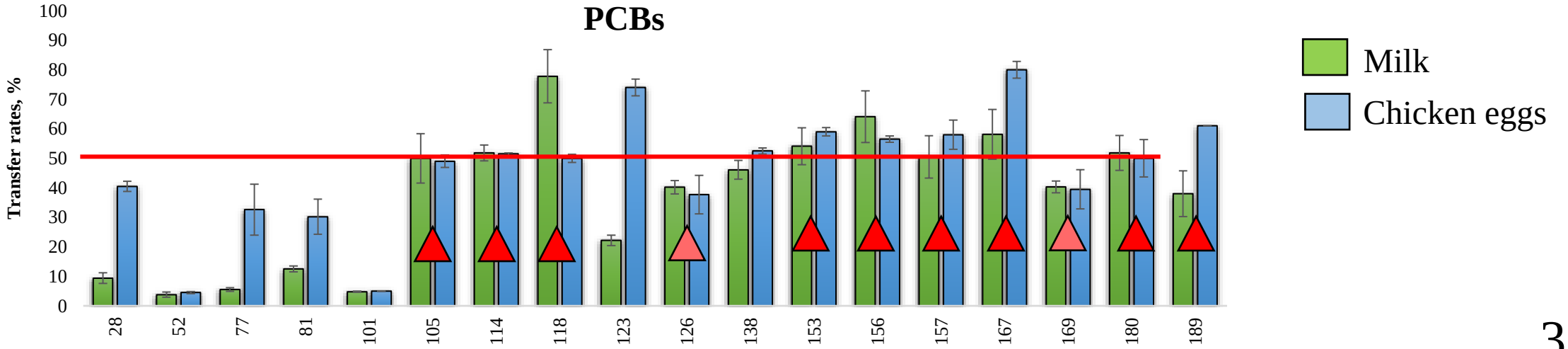
$$TR_{product} = \frac{[pollutant]_{Fat\ of\ product} * Daily\ fat\ excretion}{[pollutant]_{Diet} * Diet\ Intake} * 100\%$$

$$BCF = \frac{[pollutant]_{tissue}}{[pollutant]_{intake}}$$

Transfer of PCDD/Fs and PCBs to milk and eggs







Mean BCFs of PCDD/Fs, PCB, OCPs to liver, fat and muscle tissues

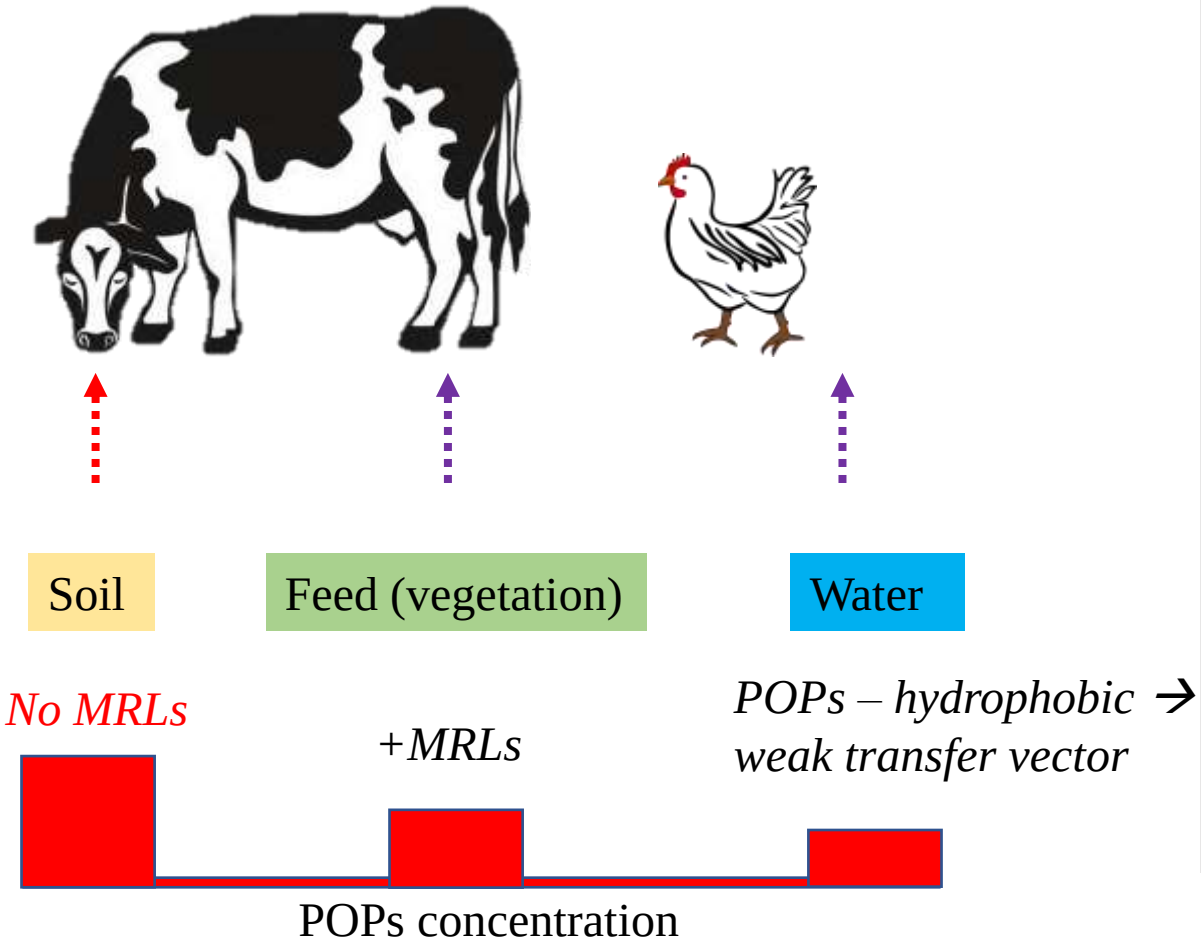
	Animals with stable BW (milk-eggs excreted animals)				Rapidly growing animals (Meat-producing animals)		
							
Liver	15	36	-	PCDDs	14	15	-
	31	21	-	PCDFs	13	31	-
	7	3	6	PCBs	-	19	-
	-	15	-	DDTs	-	-	-
	-	16	-	HCHs	-	-	-
Fat	-	11	-	PCDDs	2	1,2	0,9
	-	7	-	PCDFs	1	0,5	0,6
	-	4	1	PCBs	3	4	0,5
Muscle		17	-	PCDDs	-	1	-
		7	-	PCDFs	-	0,5	-
		9	-	PCBs	-	3	-
		5	-	DDTs	-	-	-
		16	-	HCHs	-	-	-

Conclusions

- The most toxic POPs (tetra-to hexachlorinated dioxins and furans, highly chlorinated PCBs, especially congener 126, as well as DDT) are generally highly transferred to food producing animals (dairy cows, goats and chicken) especially when they are raised on contaminated soils.

- Meta-analysis showed that specific methodologies such as TR and BCF allow to quantify and ranking the risk focusing on food safety.

Perspectives



Soil should be considered as the main POPs carrier in the case of contamination situation in a farms:

- No restricted by MRLs
- Contain much higher concentrations compare to feed and water
- Hardly possible to be removed from the areas

Thank you for attention

BRS COP - MONDAY 1st MAY, 2023

19:15 – 20:45 CEST
Room 3

IPEN SIDE EVENT

WHY LOW POPs CONTENT LEVEL MATTERS

Visit us online for IPEN's research, policy analysis, and more on chemicals, waste, and threats to our health and the environment

https://ipen.org

IPEN
for a toxics-free future

SPEAKERS

Jindrich PETRLIK

Farida AMUTOVA

Roland WEBER

Serge Molly ALLO'O ALLO'O

Lee BELL

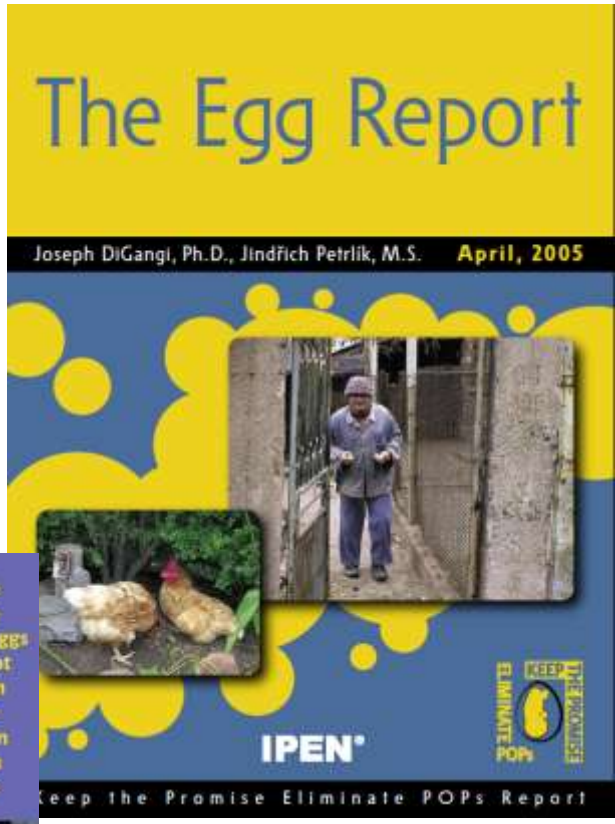
Dioxins and dioxin-like PCBs entering the food chain and the need for lower “low POP content” and unintentional trace limits for fertilizers and biosolids

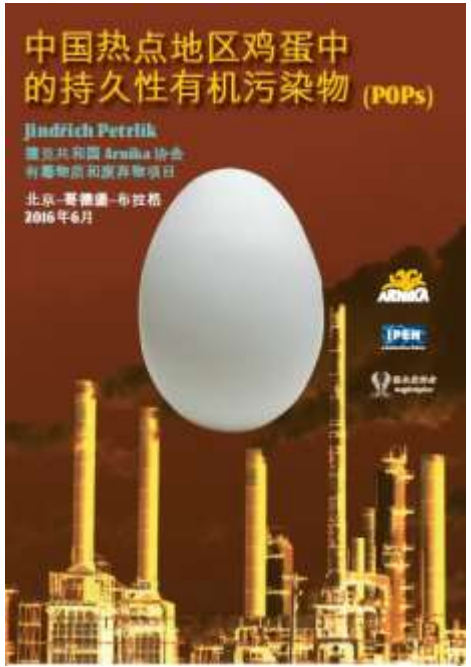
Jindrich Petrlik[1,2], Lee Bell[1,3], Joe DiGangi[1], Serge Molly Allo'o Allo'o[4], Gilbert Kuepouo[5], Griffins Ochieng Ochola[6], Valeriya Grechko[2,7], Nikola Jelinek[2], Jitka Strakova[1,2], Martin Skalsky[8], Yuyun Ismawati Drwiega[9], Jonathan Hogarh[10], Eric Akortia[11], Sam Adu-Kumi[12], Akarapon Teebthaisong[13] Maria Carcamo[14], Bjorn Beeler[1], Peter Behnisch[15], Claudia Baitinger[16], Christine Herold[17], Roland Weber[17*]

[1]International Pollutants Elimination Network (IPEN), Göteborg, Sweden; [2]Arnika – Toxics and Waste Programme, Prague, Czech Republic; [3]National Toxics Network (NTN), Perth, Australia; [4]President of the Tenth Conference of the Parties to the Rotterdam Convention, Ministry of Forestry, Fisheries and Environment, Libreville, Gabon; [5]Centre de Recherche et d‘Education pour le Développement (CREPD), Yaoundé, Cameroon; [6]Centre for Environmental Justice and Development (CEJAD), Nairobi, Kenya; [7]University of Chemistry and Technology, Czech Republic [8]Arnika – Citizens' Support CenterPrague, Czech Republic [9]Nexus3 Foundation, Denpasar, Indonesia; [10]Kwame Nkrumah University of Science and Technology, Kumasi, Ghana; [11]Ghana Atomic Energy Commission, Accra, Ghana Republic; [12]Environmental Protection Agency, Accra, Ghana; [13]Ecological Alert and Recovery – Thailand (EARTH), Nonthaburi, Thailand; [14]La Red de Accion en Plaguicidas y sus Alternativas para America Latina, Montevideo, Uruguay [15]BioDetection Systems BV (BDS), Science Park 406, 1098 XH Amsterdam, The Netherlands; [16]Bund für Umwelt und Naturschutz (BUND), Germany; [17]POPs Environmental Consulting, D-73527 Schwäbisch Gmünd, Germany.

Eggs as exposure pathway of PCDD/F & PCB from contaminated soil

- Free-range eggs are sensitive indicators for PCDD/F and PCB contamination in soils and eggs are an important exposure pathway from polluted soils to humans.
- Chickens and eggs are therefore ideal “active samplers” and indicator species for Dioxin & PCB contaminated soils.
- Since the beginning of the Stockholm Convention the International Pollutants (POPs) Elimination Network (IPEN) monitored eggs around priority UPOP sources listed in the Stockholm Convention (e.g. waste incinerators, metal industries, chemical industry, cement plants, e-waste recycling sites, dumpsites and other open burning sites).





Global egg study – Outcome of IPEN & Science for PCDD/Fs & PCBs

Contents lists available at ScienceDirect

Emerging Contaminants

journal homepage: www.elsevier.com

Monitoring dioxins and PCBs in eggs as sensitive indicators for environmental pollution and global contaminated sites and recommendations for reducing and controlling releases and exposure

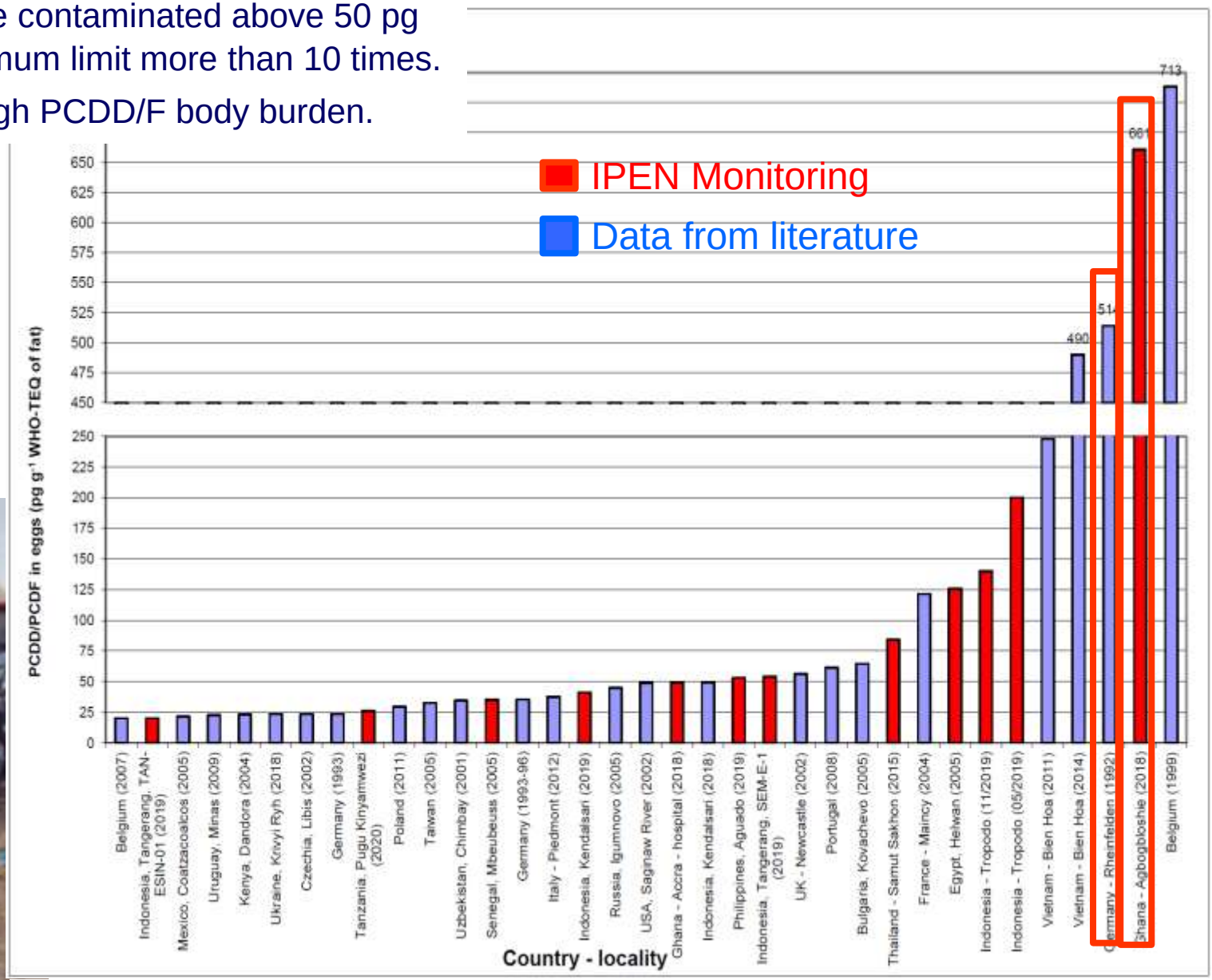
Jindrich Petrlik [a, b], Lee Bell [a, c], Joe DiGangi [a], Serge Molly Allo'o Allo'o [d], Gilbert Kuepouo [e], Griffins Ochieng Ochola [f], Valeriya Grechko [b, g], Nikola Jelinek [b], Jitka Strakova [a, b], Martin Skalsky [h], Yuyun Ismawati Drwiega [i], Jonathan N. Hogarh [j], Eric Akortia [k], Sam Adu-Kumi [l], Akarapon Teebthaisong [m], Maria Carcamo [n], Bjorn Beeler [a], Peter Behnisch [o], Claudia Baitinger [p], Christine Herold [q], Roland Weber [q, *]

Petrlik et al. (2022) Emerging Contaminants https://doi.org/10.1016/j.emcon.2022.05.001

- IPEN monitored 113 chicken flocks at potential PCDD/F- and PCB-contaminated sites and **88% of the pooled egg samples were above the EU maximum limits** for PCDD/Fs (2.5 pg PCDD/F-TEQ/g fat) or the sum of PCDD/Fs and dioxin-like PCBs (5 pg PCDD/F-PCB-TEQ/g fat).
- **Children consuming just one egg exceed the FAO/WHO TDI (based on 70 pg TEQ/kg month) and the EU tolerable weekly intake (TWI). This indicates that close to 90% of areas around these industrial emitters and open burning sources in developing countries were unsafe for the consumption of free-range eggs.**

IPEN Global Egg Study – High contaminated eggs and exposure

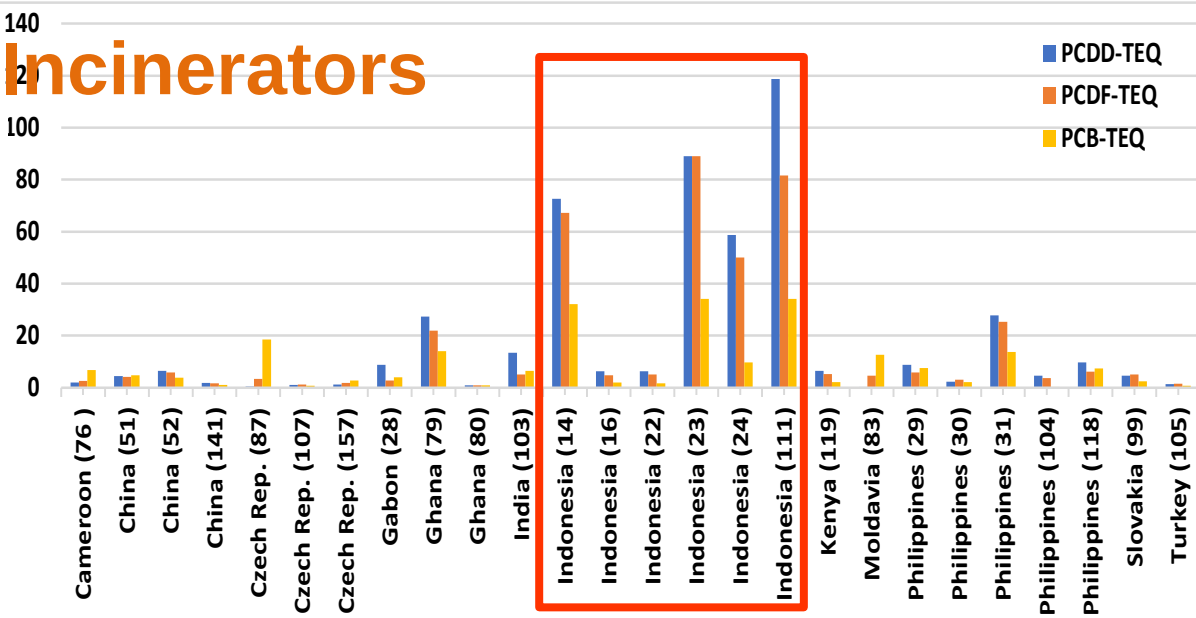
- Sixteen out of the 113 IPEN egg samples (14%) were contaminated above 50 pg PCDD/F-PCB TEQ/g fat and exceeded the EU maximum limit more than 10 times.
- People regularly consuming such eggs will have a high PCDD/F body burden.
- The blood level of people living in a German city contaminated by a chloralkali plant consuming eggs had up to 93 pg TEQ/g fat of PCDD/F in blood.
- For the highest contaminated eggs from Ghana containing a total of 1156 pg TEQ/g fat, a child (15 kg) ingests with one egg (7 g fat) more dioxins than the FAO/WHO consider tolerable intake for 230 days and the EU consider a tolerable intake for 5 years.



Petrlik et al. (2022) Emerging Contaminants https://doi.org/10.1016/j.emcon.2022.05.001

IPEN Global Egg Study – Waste Incinerators

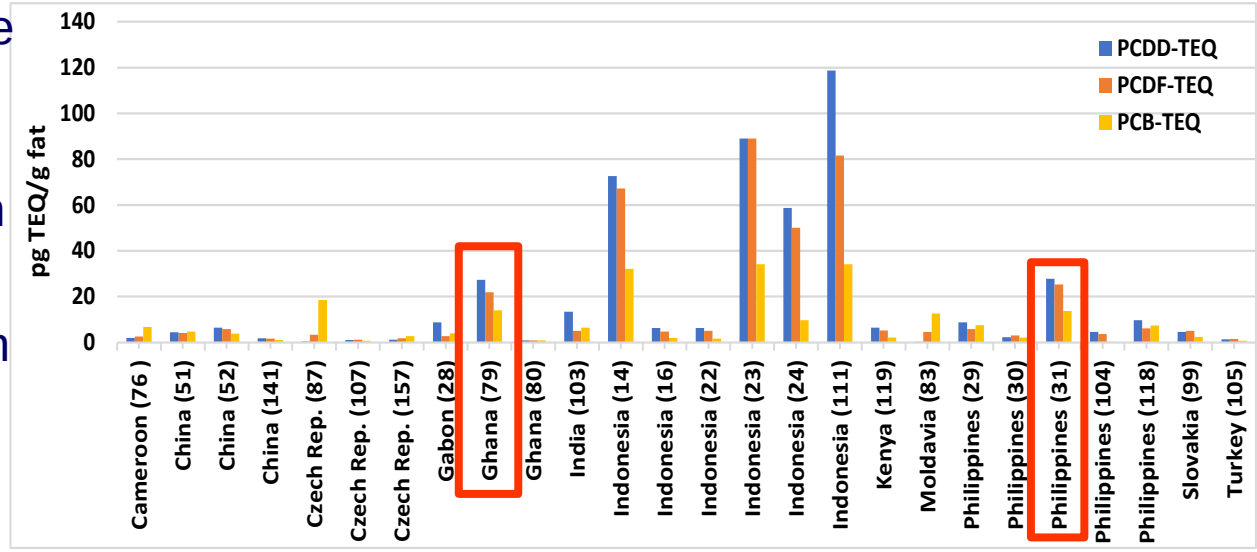
- **24 of 26 egg samples (92.3%) around waste incinerators** in 12 countries (Cameroon, China (3), Czech Republic (3), Gabon, Ghana (3), India, Indonesia (6), Kenya, Moldova, Philippines (5), Slovakia, and Turkey) exceeded the EU limit for PCDD/Fs and dl-PCBs with a mean of **43.1 pg** TEQ/g fat.
- Eggs in Tropodo/Indonesia where **plastic wastes** were used as **fuel for tofu boilers had 234 and 172 pg TEQ/g fat**. And **two chicken flocks in Java, around lime kilns burning plastic waste as a fuel had 212 and 119 pg TEQ/g fat**.
- **This highlight that co-incineration of plastic waste in non-BAT facilities result in environmental contamination and human exposure risk via chicken/eggs.**
- The free-range chickens at both locations had access to ashes stored openly next to the kilns or used for paving sidewalks. The ashes contained PCDD/Fs at levels of 120 – 1300 ng TEQ/kg. **These ashes were 10 to 100 times below Basel provisional low POP content of 15,000 ng TEQ/kg**.



Petrlik et al. (2022) Emerging Contaminants https://doi.org/10.1016/j.emcon.2022.

IPEN Global Egg Study – Waste Incinerators

- Two other highly PCDD/F contaminated pooled egg sample **(66.8 TEQ/g fat)** were collected near a **hospital waste incinerator in Aguado, Philippines** which has been operated for more than 20 years with medical waste known to contain a high share of PVC.
- Similarly, high levels (63.1 pg TEQ/g fat) were also found in pooled eggs of a flock near a batch type hospital waste incinerator in Ghana. **The mixed bottom and fly ashes with a level of 551 ng TEQ/kg** PCDD/Fs were dumped close to the incinerator where chickens also had access (Petrlik et al. 2022).
- Ash with 500 ng TEQ/kg is **30 times below the current provisional low POP limit of the Basel Convention of 15,000 ng TEQ/kg. However eggs from chickens are 30 times above regulatory limit.**

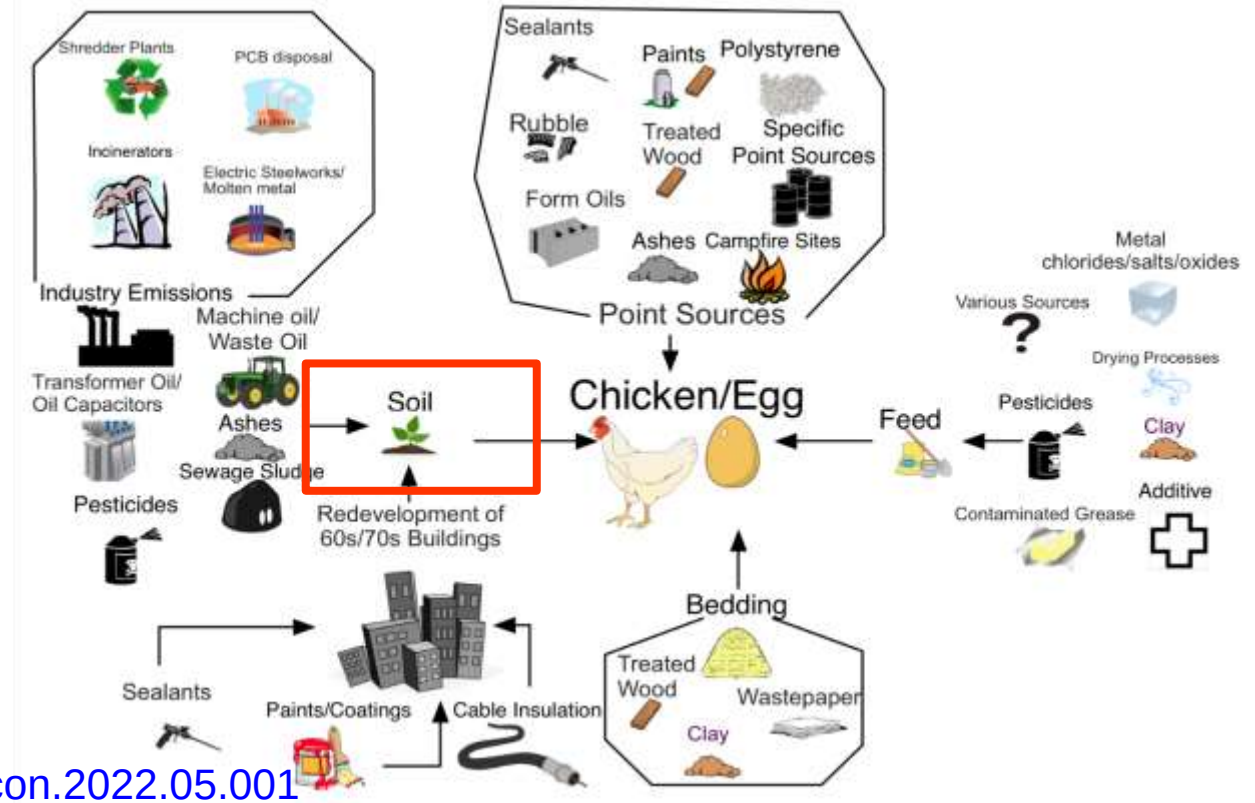


Petrlik et al. (2022) Emerging Contaminants https://doi.org/10.1016/j.emcon.2022.05.001

Science finding: Low PCDD/F & PCB levels in soil are already problematic for chicken egg/meat production – Policy action need

What are critical soil levels for impacting an egg above regulatory limit?

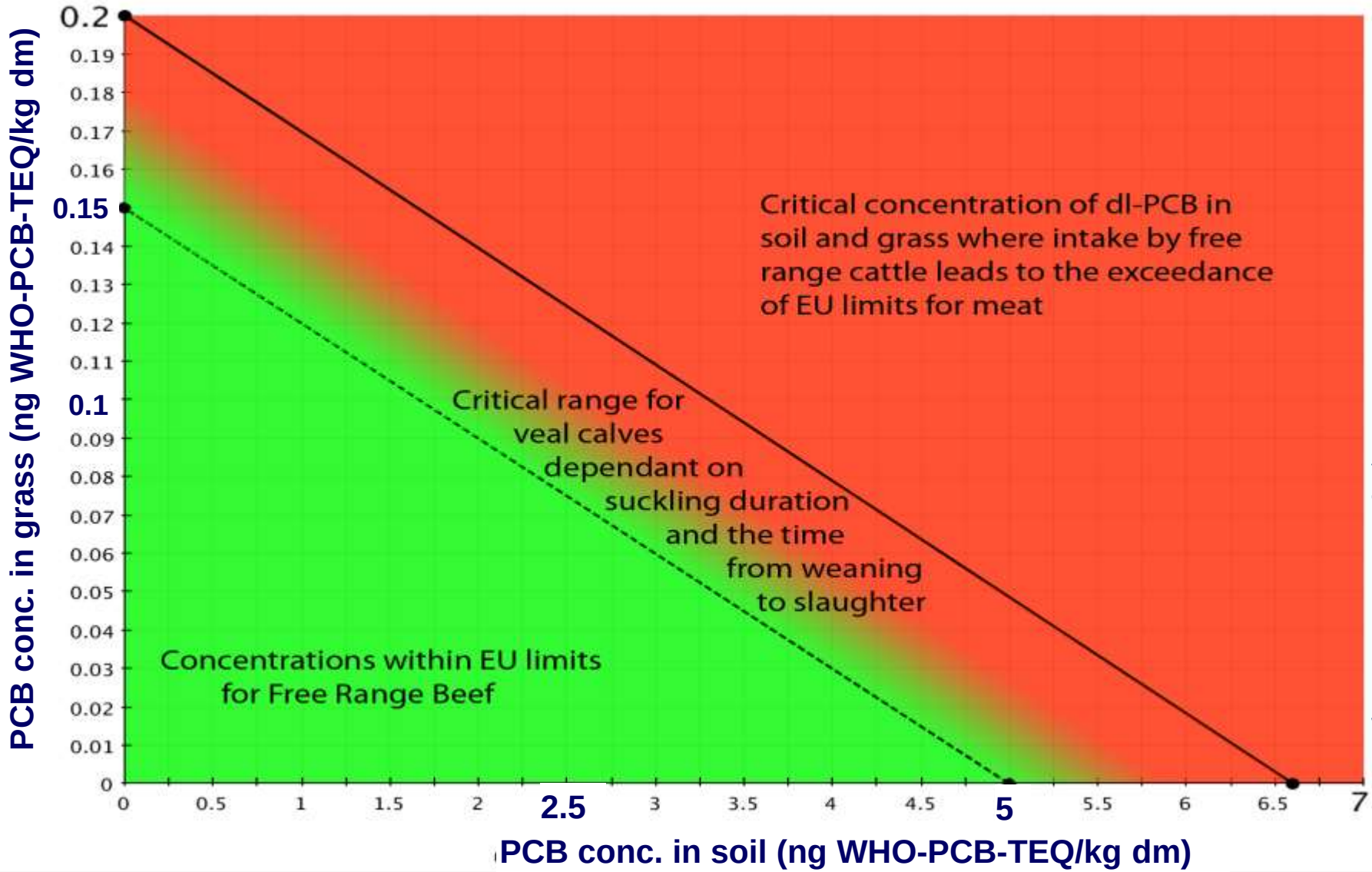
- With a total uptake of 25 pg (50 pg) TEQ/day a chicken reaches the current EU-limit of 2.5 pg (5 pg) for PCDD/F (sum PCDD/F-PCB) TEQ/g fat in egg.
- Free range chicken which spend a lot of time outdoor have a soil uptake of approx. 11-30 g soil/day.
- With a carry over of approx. 50% for TEQ-relevant PCB & PCDD/F the problematic levels in soils **for free range chicken** to reach EU limit for eggs (and meat) are approx. **3 to 7 ng TEQ/kg for ∑PCDD/F+dl-PCB**
- This **problematic soil levels are extremely low** and **are exceeded in many areas of industrial emissions and can also be exceeded in cities or residential areas** (e.g. from ashes, pesticides, open burning or deposition).
- **The current provisional low POPs limit established by the Basel Convention of 15,000 ng TEQ/kg is orders of magnitude too high for residues and needs to be re-evaluated and lowered.**



Weber et al. (2018) Environ Sci Eur. 30:42. https://rdcu.be/bax79 ;
Weber, Bell et al. (2019) Environ Pollut. 249, 703-715.
Petrlik et al. (2022) Emerging Contam. https://doi.org/10.1016/j.emcon.2022.05.001

Problematic dl-PCB levels in grass and soil for cattle

Deduction of critical **dl-PCB levels in grass and soil for suckling cattle herds** (intake 10 kg grass/day with 3% soil; based on **critical total intake of 2 ng dl-PCB TEQ/day**) to reach EU regulatory limits.



Also for milk & milk products the soil levels should be <5 ng TEQ/kg considering the TDI from milk and milk products. Weber et al. (2018) 20 Jahre Biomonitoring in Bayern. Umwelt Spezial (2018). Herausgeber Bayerisches Landesamt für Umwelt.

Weber et al. (2018) Environ Sci Eur. 30:42. https://rdcu.be/bax79

Control/limit of PCDD/PCDF and dl-PCBs in fertilizers/biosolids

Fertilizer (including biosolids or ashes from biomass) can be a dioxin/POP source for agriculture.

- Therefore e.g. Germany developed regulatory limits for fertilizers (DüMV 2019) including limits for PCDD/Fs & dl-PCBs. Also a proposal for a fertilizer regulation in the EU has been developed (JRC).
- A **"Basel low POP content" of 15,000 ng TEQ/kg can mislead authorities in managing ashes/waste.**
- **And the limit has been derived with wrong assumptions** (Swedish EPA 2011; Weber et al. 2019; Lopez & Proença 2020; Wu et al. 2020).

Regulation	Pollutant	Limit value	Application/remark
Germany	a) PCDD/F + dl-PCB	**30 ng TEQ/kg**	All with exemption of b)
Germany	b) PCDD/F + dl-PCB	**8 ng TEQ/kg**	b) pasture land and production of feed & farmland without plowing
EU (2019)	PCDD/F	**20 ng TEQ/kg**	Fertilizer to land (JRC proposal)
Basel „low POP content"	PCDD/F	**15,000 ng TEQ/kg**	Misleading for further use; flaws in derivation!

EU (2019) JRC report EU fertilizer; ISBN 978-92-76-09888-1, doi:10.2760/186684, JRC117856
Swedish EPA (2011). *Low POP Content Limit of PCDD/F in Waste*. Report 6418; ISBN 978-91-620-6418. Lopes H, Proença S (2020) Appl. Sci. 2020, 10, 4951 https://doi.org/10.3390/app10144951; Wu et al. Emerg. Contam. 6, 235-249. https://doi.org/10.1016/j.emcon.2020.07.001; Weber et al. (2019) Environ Pollut. 249, 703-715. DüMV (2019) Düngemittelverordnung vom 5. Dezember 2012 (BGBl. I S. 2482), d

- **Need of science based unintentional trace limits for PCDD/F, PCB (and PFOS/PFOA) in fertilizer.**

Flaws in the original derivation of the PCDD/F low POP content

The low POP limit was derived from a study of BIPRO for the European Union (BIPRO 2005). However the risk assessment by BIPRO was flawed (Swedish EPA 2011) and this low POP content is not protective:

- The BIPRO risk assessment assumed that a PCDD/F concentration of **30 pg WHO TEQ/g** fat is acceptable in eggs. However the consumption of one egg of just 4 pg WHO-TEQ/g fat per day (7.5 g fat) is enough to contribute total WHO TDI or EFSA TWI for a child of 15 kg.
- Further the **study estimated** that their assumed critical PCDD/F concentration of **30 pg WHO-TEQ/g fat** in **eggs correspond to a soil** concentrations of **1000 ng TEQ/kg** (BIPRO 2005). **However chicken eggs produced on soils with 1000 ng TEQ/kg result in eggs of ~800 pg TEQ/g (Weber et al. 2018; 2019).**
- This demonstrates that the BIPRO assessment significantly underestimated the risk and the basis for low POPs limits was inappropriate (by a factor of ~250; factor 7.5 for egg levels & factor 3 for accumulation).
- Consequently the calculation from which the 15,000 ng TEQ/kg low POP limit was originally derived is wrong by a factor of 250 and the current low POPs limit is far too high.
- For biosolids and other fertilizer **the limits set by the German fertilizer regulation seems appropriate**.

BIPRO (2005) Study to Facilitate the Implementation of Certain Waste Related Provisions of the Regulation on Persistent Organic Pollutants (POPs) ENV.A.2/ETU/2004/0044; **Swedish EPA (2011).** *Low POP Content Limit of PCDD/F in Waste*. Report 6418; ISBN 978-91-620-6418.; **Wu et al. (2020**) Emerg. Contam. 6, 235-249. https://doi.org/10.1016/j.emcon.2020.07.001; **Weber et al. (2018)** Environ. Sci. Eur., 30, 42 https://rdcu.be/bax79; **Weber et al. (2019)** Environ Pollut. 249, 703-715.

3.4 Conclusions and policy recommendations

3.4.1 Overall conclusion on egg and soil contamination and related human exposure
3 4.2 Preliminary conclusions on time trends
3.4.3 Stop transgressing the global boundary for “Novel Entities”

Recommendations on waste management

3 4.4 **Recommendation to improve management of POPs wastes and tracking of pollution in the POPs life cycle**
3.4.5 **Recommendation of improved management of plastics and e-waste** and stop of thermal treatment in non-BAT facilities by effective implementation of conventions

Recommendations on inventory of emission sources and contaminated sites

3.4.6 Systematic inventory of sites and potential contamination around emission sources within the inventory activities of Stockholm Convention
3.4.7 Systematic monitoring of human exposure from contaminated sites to reduce and minimize exposure
3.4.8 Capacity building for monitoring in developing countries including bioassay

Recommendations on legislative limits

3.4.9 **Recommendation on re-evaluation of soil limit values**
3.4.10 **Recommendation for industrial emissions and for low POPs limits** in particular for fertilizer and other soil amendments (approx. 10 ng TEQ/kg)
3.4.11 Recommendation for unintentional trace content limits for pesticides/chemicals

Addressing farmers and consumer needs

3 4.12 **Measures to control exposure**
3.4.13 **Compensation of farmers and consumers by applying PPP**

Petrlik et al. (2022) Emerging Contaminants https://doi.org/10.1016/j.emcon.2022.05.001

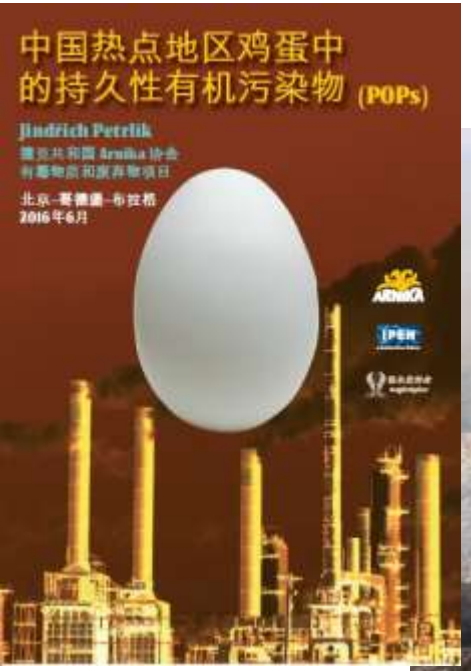
Monitoring dioxins and PCBs in eggs as sensitive indicators for environmental pollution and global contaminated sites and recommendations for reducing and controlling releases and exposure

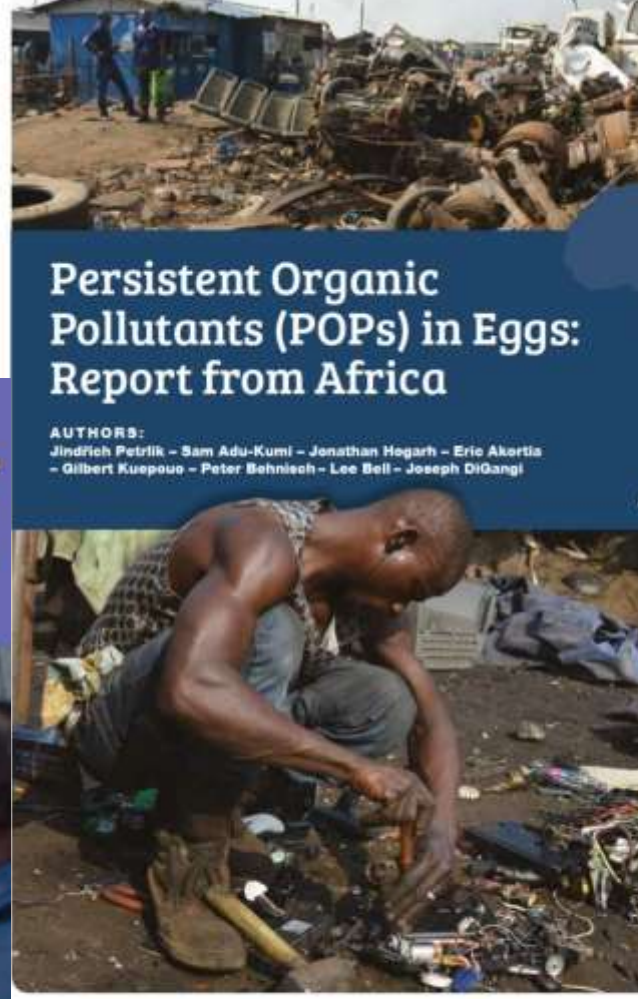
Jindrich Petrlik [a,b], Lee Bell [a,c], Joe DiGangi [a], Serge Molly Allo'o Allo'o [d], Gilbert Kuepouo [e], Griffins Ochieng Ochola [f], Valeriya Grechko [b,g], Nikola Jelinek [b], Jitka Strakova [a,b], Martin Skalsky [h], Yuyun Ismawati Drwiega [i], Jonathan N. Hogarh [j], Eric Akortia [k], Sam Adu-Kumi [l], Akarapon Teebthaisong [m], Maria Carcamo [n], Bjorn Beeler [a], Peter Behnisch [o], Claudia Baitinger [p], Christine Herold [q], Roland Weber [q,*]

ELSEVIER
Contents lists available at ScienceDirect
Emerging Contaminants
journal homepage: www.elsevier.com

PROOF

Thank you for your attention





ARNIKA

IPEN
a toxics-free future

Acknowledgements: Part of this research was funded by EU Aid Non-state Actors Programme, government of Sweden and by the Global Greengrants Fund and Sigrid Rausing Trust for projects led by Arnika – Toxics and Waste Programme/IPEN.

Alex Watson is acknowledged for the design of figures in slide 9 & 11.

BRS COP - MONDAY 1st MAY, 2023

19:15 – 20:45 CEST
Room 3

IPEN SIDE EVENT

WHY LOW POPs CONTENT LEVEL MATTERS

Visit us online for IPEN's research, policy analysis, and more on chemicals, waste, and threats to our health and the environment

https://ipen.org

IPEN
for a toxics-free future

SPEAKERS

Jindrich PETRLIK

Farida AMUTOVA

Roland WEBER

Serge Molly ALLO'O ALLO'O

Lee BELL

BRS COPs Geneva (Switzerland), 1st-12 May 2023
IPEN Side-event 1st May, CICG

Why low POPs Content Level (LPCL) matters?'
En quoi la faible teneur en POPs est-elle importante ?

Mr. Serge Molly Allo'o Allo'o

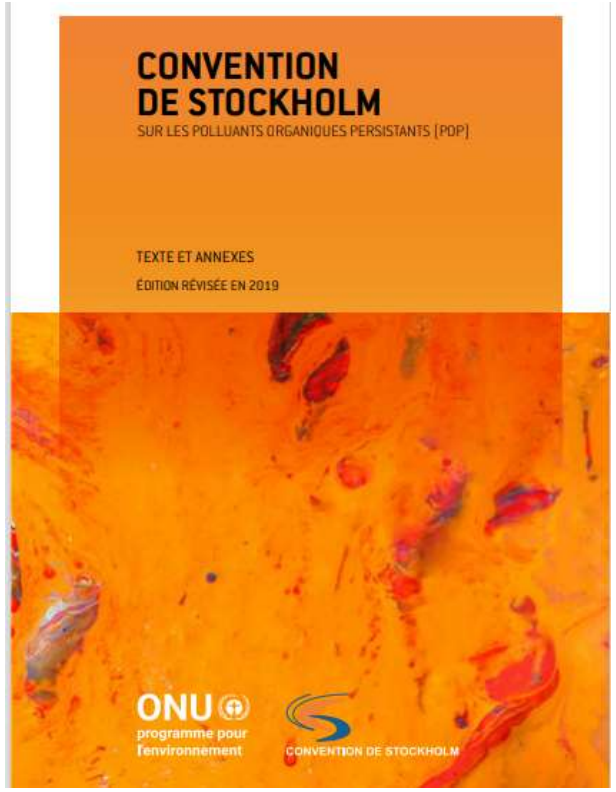
CRCB-AF (Dakar), Expert From Gabon

- Rotterdam COP-10 President
- Co-Facilitator IP-4.2 SAICM
- Member of Expert Group on Hg Threshold
- Minamata COP 1 & 2 Vice President
- Former NFP of BC & Minamata

Plan

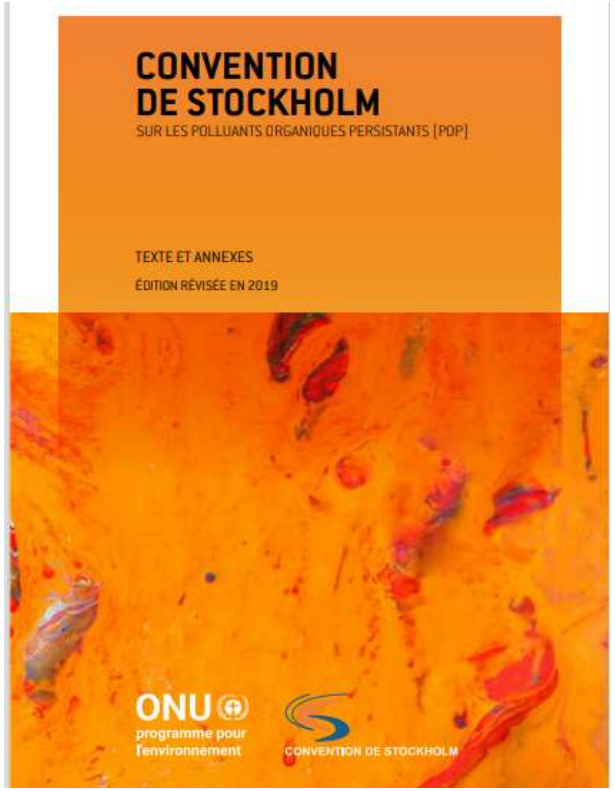
- LPCL & SC?
- 1. What is the African group's position on Low POPs Content Levels?
- 2. Why is it important for Africa to have strict limits for POPs in waste?
- 3. What is the impact of POPs waste on people living in Africa or other developing countries?
- 4. Does the importation of waste with POPs pose a threat to Africa?

LPCL & SC?



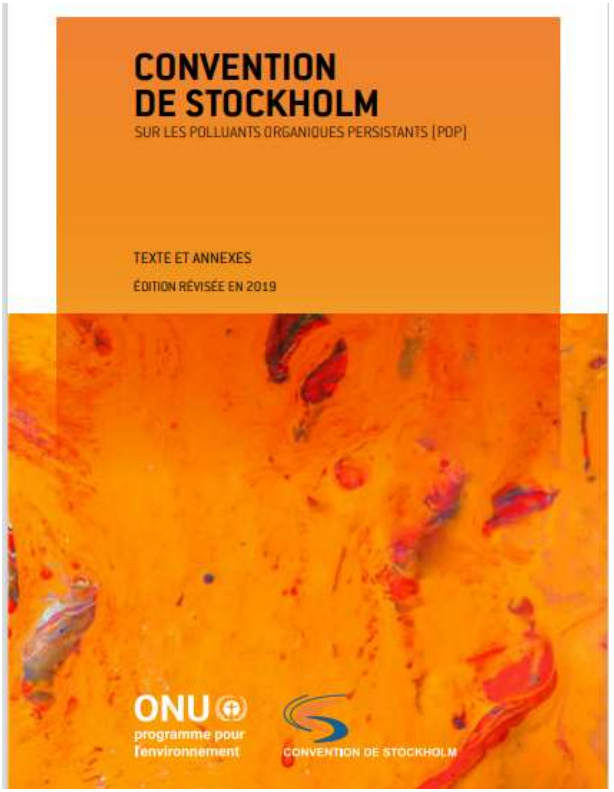
- The Low POPs Content Definition (LPCL) determines which wastes will be considered POPs wastes and which will not. The LPCL is based on the context of the Stockholm Convention (Art. 6 focused on POPs wastes) whose objective is to protect human health and the environment from persistent organic pollutants.
- *La définition de la faible teneur en POP (LPCL) détermine quels déchets seront considérés comme des déchets de POP et lesquels ne le seront pas. La LPCL est basée sur le contexte de la Convention de Stockholm (Art. 6 axé sur les déchets de POP) dont l'objectif est de protéger la santé humaine et l'environnement contre les polluants organiques persistants.*

1. What is the African group's position on Low POPs Content Levels?
1. Quelle est la position du groupe africain sur les faibles teneurs en POP ?



- The Africa Region supports and welcomes the idea of establishing low POPs content limits in wastes to protect human health and the environment from this harmful chemicals. Our comments are specific **to section III/A of the general technical guidelines of the Basel Conventions** on proposals for provisional definitions of low POPs contents in waste for each pollutant listed under the Stockholm Convention.
- *La région Afrique soutient et accueille favorablement l'idée d'établir des limites de faible teneur en POP dans les déchets afin de protéger la santé humaine et l'environnement de ces produits chimiques nocifs. Nos commentaires portent spécifiquement sur la section III/A des directives techniques générales des conventions de Bâle sur les propositions de définitions provisoires de faibles teneurs en POP dans les déchets pour chaque polluant figurant sur la liste de la convention de Stockholm.*

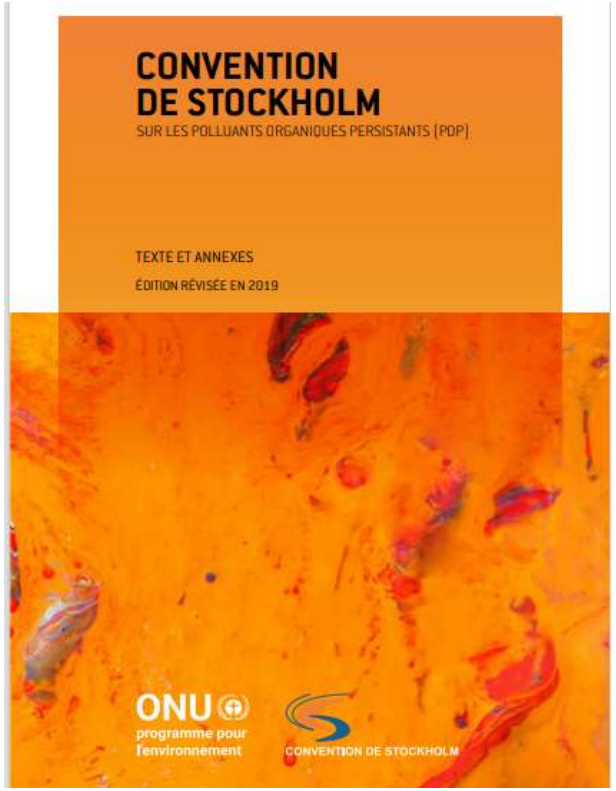
2. Why is it important for Africa to have strict limits for POPs in waste? (1/2)
2. Pourquoi est-il important pour l'Afrique d'avoir des limites strictes pour les POP dans les déchets ? (1/2)



- The region want to ensure that the lowest possible limits be established to ensure minimal to no effects posed by such wastes to it population and the environment. The region is mindful and concern that POPs demonstrate serious health problems such as endocrine disrupting chemicals with very minimal concentrations. We are also taking into consideration the complexity of anthropogenic sources of POPs in the environment.
- *La région veut s'assurer que les limites les plus basses possibles soient établies afin de garantir que les effets de ces déchets sur la population et l'environnement soient minimes, voire nuls. La région est consciente et préoccupée par le fait que les POP posent de graves problèmes de santé, tels que les perturbateurs endocriniens, à des concentrations très faibles. Nous prenons également en considération la complexité des sources anthropiques de POP dans l'environnement.*

2. Why is it important for Africa to have strict limits for POPs in waste? (2/2)

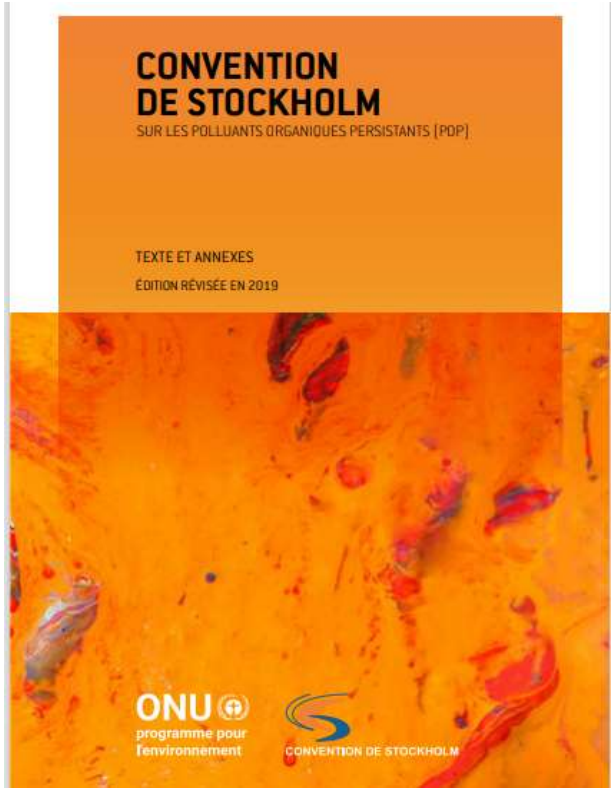
2. Pourquoi est-il important pour l'Afrique d'avoir des limites strictes pour les POP dans les déchets ? (2/2)



- **Precautionary principle:** The African region is proposes the following low POPs values (see Table 2 entitled "*Interim Low POPs Definitions*").
- **Principe de précaution**: La région Afrique est favorable aux 5 POPs et leurs groupes, les valeurs de faible teneur en POP (cf. tableau 2 intitulé *"Définitions provisoires de faible teneur en POP* »).
  - 1 ppb (= 1 µg/g OMS-TEQ) for the sum of PCDD/f and dl-PCB
  - 100 ppm (= 100 mg/kg) for HBCD
  - 50 ppm (= 50 mg/kg) for the sum of PBDE (including the DecaBDE)
  - 100 ppm (= 100 mg/kg) for SCCPs
  - 0.025 ppm (= 0.025 mg/kg) for PFOS, PFOA or PFHxS and their salts individually; 10 ppm (= 10 mg/kg) for sum of PFOS, PFOA, PFHxS and related compounds

3. What is the impact of POPs waste on people living in Africa or other developing countries?

3. Quel est l'impact des déchets de POP sur les populations vivant en Afrique ou dans d'autres pays en développement ?

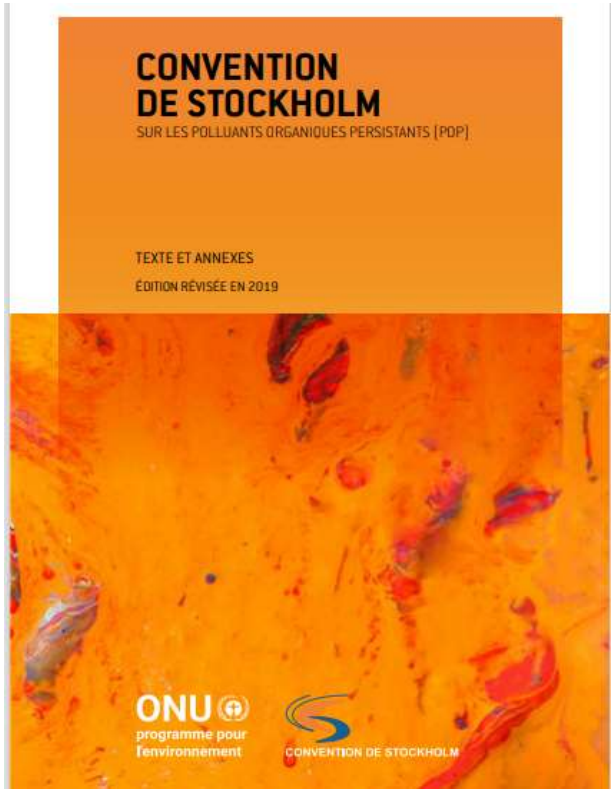


- The region and others developing countries are concern with detrimental health effects that POPs may pose to the health of its vulnerable communities particularly women and children: Endocrine disruption problems, cancers, neurodevelopmental disorders, birth defects and other health risk. This is important to take action taking into consideration the rudimentary and lack proper health cares in most of developing countries.
- *La région et d'autres pays en développement sont préoccupés par les effets néfastes que les POP peuvent avoir sur la santé de leurs communautés vulnérables, en particulier les femmes et les enfants : Problèmes de perturbation endocrinienne, cancers, troubles du développement neurologique, malformations congénitales et autres risques pour la santé. Il est important de prendre des mesures en tenant compte du caractère rudimentaire et du manque de soins de santé appropriés dans la plupart des pays en développement.*

4. Does the importation of waste with POPs pose a threat to Africa?
4. L'importation de déchets contenant des POP constitue-t-elle une menace pour l'Afrique ?

- Yes, high POPs waste, articles and products containing or contaminated can pose a significant risk to human health and the environment. For this reason, it is important for the Region to emphasize the importance of adopting the precautionary principle to ensure that POPs wastes do not pose a risk to humans and the environment.
- *Oui, les déchets à forte teneur en POP, les articles et les produits contenant des POP ou contaminés peuvent présenter un risque important pour la santé humaine et l'environnement. Pour cette raison, il est important que la région souligne l'importance d'adopter le principe de précaution pour s'assurer que les déchets de POP ne posent pas de risque pour l'homme et l'environnement.*

Conclusion



- Recognizing that most POPs are endocrine disruptors and taking into account their variety and complexity of anthropogenic sources, the Africa region supports stringent and protective LPCLs in waste.
- *Consciente que la plupart des POP sont des perturbateurs endocriniens et tenant compte de leur variété et de la complexité de leurs sources anthropiques, la région Afrique est favorable à des LPCL strictes et protectrices dans les déchets de POP*.

Thank you!

Merci !

Contact: sergemolly14@gmail.com

Tel: +241 77708528


BRS COP - MONDAY 1st MAY, 2023
19:15 – 20:45 CEST
Room 3
IPEN SIDE EVENT
WHY LOW POPs CONTENT LEVEL MATTERS
Visit us online for IPEN's research, policy analysis, and more on chemicals, waste, and threats to our health and the environment
https://ipen.org
IPEN
for a toxics-free future

GEN & IPEN AT BRS COPS '23

Visit ***tiny.cc/GEN2023BRSCOPs*** for more info.

IPEN for a toxics-free future

GENEVA ENVIRONMENT NETWORK

CONFERENCE

Science-Policy Panel on Chemicals, Waste and Pollution Prevention: Building the Linkages from Science to Action | BRS COPs 2023 Side Event / SPP-CWP Series

02 MAY 2023 13:15 - 14:45

CICG | Room B & Online | Webex

OEWG SPP CWP, GEN

Chemicals and Pollution | Science

SDG3 | SDG12

CONFERENCE

Plastics and chemicals under the Stockholm convention: Impact on the ground and potential synergies and gaps in relation to a future plastics treaty | BRS COPs 2023 Side Event

04 MAY 2023 18:15 - 19:45

CICG | Room 11-12 & Online | Webex

IPEN

Chemicals and Pollution

SDG3 | SDG12

CONFERENCE

PCB elimination by 2028: Potential of the non-combustion destruction technologies | BRS COPs 2023 Side Event

05 MAY 2023 13:15 - 14:45

CICG | Room B & Online | Webex

IPEN

Chemicals and Pollution

SDG3 | SDG12

THIS WEEK

GEN & IPEN AT BRS COPS '23

Visit ***tiny.cc/GEN2023BRSCOPs*** for more info.

IPEN for a toxics-free future

GENEVA ENVIRONMENT NETWORK

NEXT WEEK

CONFERENCE

Connecting the dots: Youth and the National Implementation Plans (NIPs) | BRS COPs 2023 Side Event

09 MAY 2023 18:15 - 19:45
CICG | Room 3 & Online
IPEN

Chemicals and Pollution
SDG3 | SDG12

CONFERENCE

Advancing a Human Rights-based Approach to Pollution for People and the Planet | BRS COPs 2023 Side Event

10 MAY 2023 13:15 - 14:45
CICG | Room C & Online
OHCHR, UNEP, UNDP, ILO, UNECE, FAO, Minamata Convention on Mercury, UN

Chemicals and Pollution | Human Rights and Environment
SDG12

CONFERENCE

Unlocking MEAs' Potential: Supporting Parties' Environmental Action through Data and Knowledge Management | BRS COPs 2023 Side Event

10 MAY 2023 18:15 - 19:45
CICG | Room 11-12 & Online
BRS, Minamata Convention on Mercury, CITES, InforMEA, GEN

Chemicals and Pollution
SDG17


BRS COP - MONDAY 1st MAY, 2023
19:15 – 20:45 CEST
Room 3
IPEN SIDE EVENT
WHY LOW POPs CONTENT LEVEL MATTERS
Visit us online for IPEN's research, policy analysis, and more on chemicals, waste, and threats to our health and the environment
https://ipen.org
IPEN
for a toxics-free future