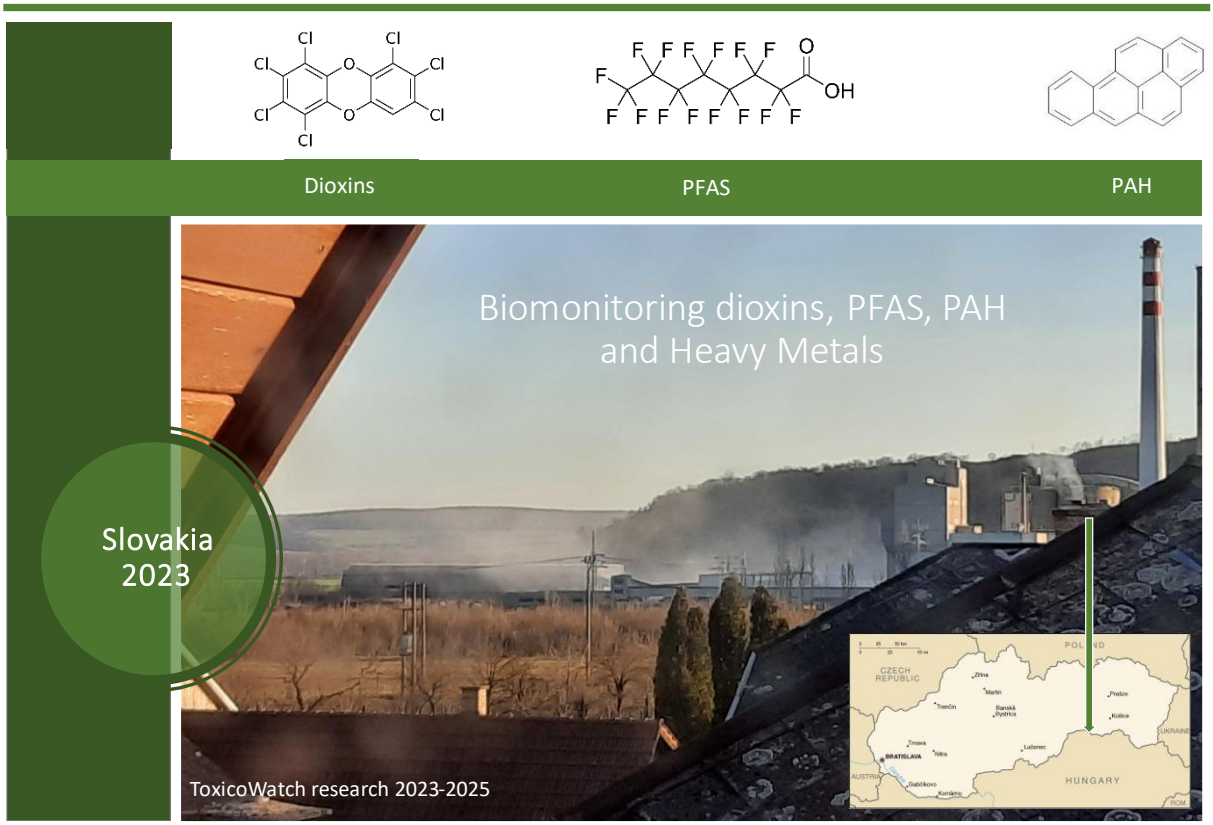
TOXICO WATCH

Biomonitoring research on persistent organic pollutants in the surrounding environment of the Cement plant Turňa nad Bodvou, Slovakia, 2023



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March, 2024

ZERO WASTE EUROPE

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Acknowledgements

Thank you to Zero Waste Europe for enabling this research on persistent organic pollutants (POPs). Special thanks to all the participants in the villages of Dvornìke, Hosťovce, Zádiel, Včeláre and Turňa nad Bodvou for their cooperation and trust in allowing us to analyse their backyard chicken eggs, vegetation, fruit, and roof dust. Your contribution has greatly enhanced our understanding of the environmental health in your communities.

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Table of content

Acronyms

APCD	Air Pollution Control Devices
BAT	Best Available Techniques
BEP	Best Environmental Practice
BEQ	Bioanalytical EQuivalents
BFR	Brominated Flame Retardants
BMI	Body Mass Index
BREF	Best Available Techniques (BAT) Reference Document for Waste Incineration
BBT	Best Available Techniques (BAT)
dl-PCB	Dioxin-Like Polychlorinated Biphenyls
DR CALUX®	Dioxin Responsive Chemical-Activated LUciferase gene eXpression
EFSA	European Food and Safety Authority
GC-MS	Gas Chromatography Mass Spectrometry GC-MS
GenX	Group of fluorochemicals related to of hexafluoropropylene oxide dimer acid (HFPO-DA)
i-PCB	Indicator Polychlorinated Biphenyl
LB	Lower Bound
LOD	Limit of Detection
LOQ	Limit of Quantification
MB	Medium Bound
MWI	Medical Waste Incineration
MSWI	Municipal Solid Waste Incineration
ndl-PCB	Non-Dioxin-Like Polychlorinated Biphenyl (Non-Dioxin-Like PCB)
ng	Nanogram; 10^{-9} gram
OTNOC	Other Than Normal Operating Conditions
PAH	Polycyclic Aromatic Hydrocarbons
PCB	Polychlorinated Biphenyl
PCDD	Polychlorinated Dibenzodioxins
PCDF	Polychlorinated Dibenzofurans
PBDD/F	Polybrominated-dibenzodioxins and furans
pg	Picogram; 10^{-12} gram
POP	Persistent Organic Pollutants
SVHC	Substances of Very High Concern
TCDD	2,3,7,8-tetrachloordibenzo-*p*-dioxine
TDI	Tolerabele Daily Intake = Aanvaardbare Dagelijkse Inname
TEF	Toxic Equivalency Factor
TEQ	Toxic Equivalents
TW	ToxicoWatch
TWI	Tolerable Weekly Intake
UB	Upper Bound (UB)
UPOP	Unintentional POP (Persistent Organic Pollutants)
µg	Microgram 10^{-3} gram
WtE	Waste to Energy (waste incinerator)

Introduction

The civic organisation Zelený živel o.z. representing environmentally conscious residents in Turnianska Kotlina, took the initiative in 2023 to contact Zero Waste Europe and ToxicoWatch (TW) for independent research on the deposition of persistent organic pollutants (POPs) such as dioxins (PCDD/F/dl-PCB), Polycyclic Aromatic Hydrocarbons (PAH) and PFAS, as well as heavy metals in the environment surrounding the cement kiln Cementáreň Turňa nad Bodvou, located in the Košice Region in Slovakia. According to the Turňa nad Bodvou Cement Plant's website[1], the plant is equipped with state-of-the-art BAT/BREV equipment. Waste gases, with a volume flow rate of 165000 m^3/hour are discharged into the air through a fabric filter and subsequently through a chimney with a height of 51.0 meters. The dust separated by the fibre filters is transported as dried clay to the raw material landfill. The conveyor belts used for transporting the clay for crushing within the plant to the sieving station are dust-tight.[2] Cement production ranks among the energy-intensive industries. This plant, supported by EU grants, burns waste materials, ranging from plastic agglomerate, worn-out old used car tyres, and PCB oil-containing waste [3] - as a sustainable alternative to fossil fuels. There are plans to increase waste burning from 65,000 to 115,000 tons annually, a nearly 50% increase. Cement kilns are utilised for the destruction of persistent organic pollutants such as PCBs and PFAS, owing to the higher combustion temperatures they provide.

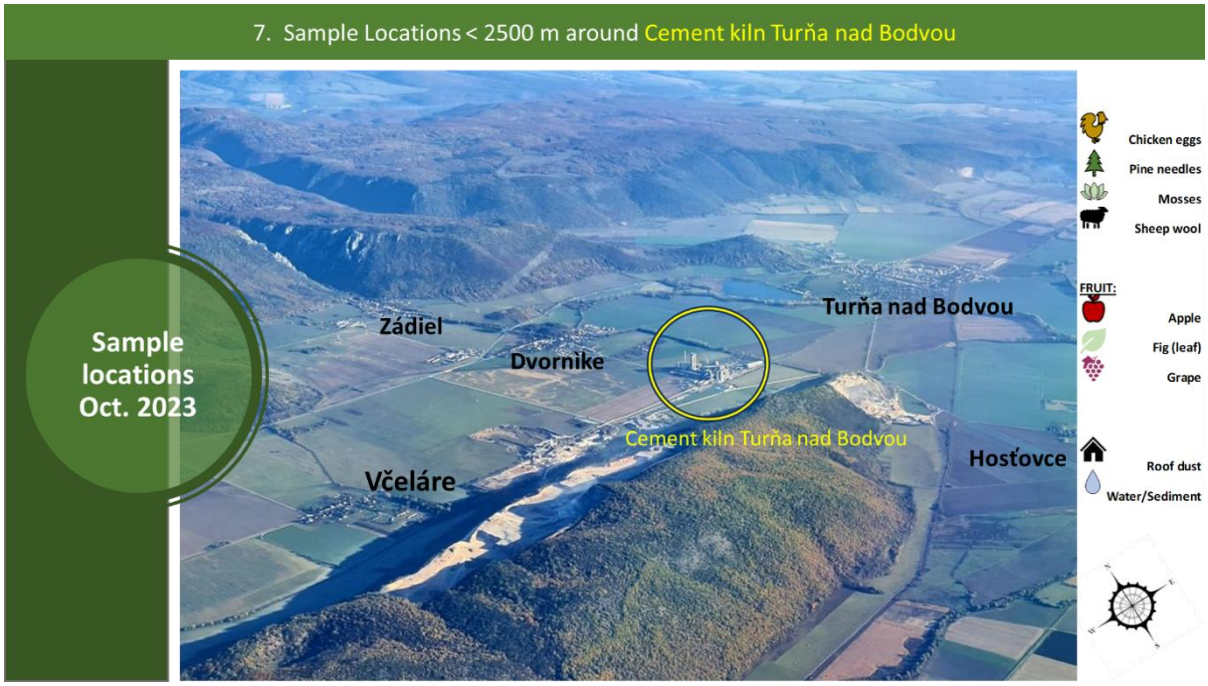
Emissions of pollutants must adhere to the emission limits set by EU Decree No 410/2003 Coll. (Air Act No. 137/2010 Coll. repeals several regulations) as amended for cement rotary kilns and should refer to Industrial Emissions Directive and BREF 2023.[4] It's noteworthy that emissions of dioxins are measured only a few hours per year. The last publication dates to 2018 with limited information on dioxin emissions and lacking detailed TEQ distribution data. No recent data are available on emissions and depositions of other persistent organic pollutants (POPs), like PAH, fluorine compounds (PFAS), and dioxin-like PCBs. This TW research does not (yet) include monitoring of brominated dioxins (PBDD/F) or other halogenated POPs but might be necessary to investigate the emission of these abundant flame retardants.

In this report, TW's research focuses on assessing the environmental impact around the cement kiln Turňa nad Bodvou. We employ biomonitoring techniques using eggs from backyard chickens, as well as analysing fruit and vegetation for dioxins, PFAS, PAH and heavy metals. Alongside cement production, the region of Košice faces additional industrial sources of air pollution. Notably, in Včeláre and Hosťovce quarries, limestone, a basic raw material for cement production, is extracted. Adjacent to the cement kiln are ecologically significant areas, including the Protected Bird Area Slovak Karst (SKCHVÚ 027) and the National Nature Reserve - Zádielska Gorge, which forms part of the Slovak Karst National Park.

[1] https://www.danucem.com/site/2/Turňa -nad-bodvou-cement-plant
[2] Increase in the output of the furnace line VSH, a.s. Turňa nad Bodvou to 3500 tons of clinker per day - OBJECTIVE
[3] *Wastes classified under catalogue numbers 191210, 191211, 19121212, 19121212, 191214 and 160119. In addition, wastes are classified under catalogue numbers 191204 (Plastic agglomerate) and 160103 (Worn tyres).*
[4] *https://eeb.org/wp-content/uploads/2023/04/Upgrading-Europes-air.pdf*

Sampling

This biomonitoring research comprehended the biomarkers: eggs of backyard chickens, eggshells, pine needles (*Picea abies*), mosses (*Bryophyta*), and fruits such as apples, grapes, and figs leaves, as well as the matrices roof dust, sediment, and water. The research area covers the environment of five (5) surrounding villages of the cement kiln within a radius of 2500 meters. The afore-mentioned samples are taken from four (4) locations in Dvornìke, three (3) in Včeláre, three (3) in Hosťovce, two (2) in Zádiel and one (1) in Turňa nad Bodvou.



Eggs

At each egg location, TW collected (2) sets of 6 - 10 fresh eggs, mixed the total contents (egg yolk and white) and stored them in HDPE lab containers in a freezer until analyses in the lab. A questionnaire and a location inspection are conducted at every backyard chicken egg location by the TW team, to identify any potential confounder fact.

Fruit

TW collected samples of 200–300-gram fresh fruit from the fruit trees and shrubs, which were placed in special HDPE-lab bags, and stored in a cool, dry environment.

Vegetation (Mosses /Pine needles)

Vegetation samples, 200–300-grams of fresh pine needles from Pine trees – *Picea abies* and 200–300-gram mosses (*Bryophyta*), were collected from sheds' roofs at the same locations as the egg sampling. Additionally, moss (*Bryophyta*) samples were collected from a rural open field on a hill near Dvornìke. All vegetation samples were stored in HDPE-lab bags, in a cool, dark, and dry environment.

Roof dust

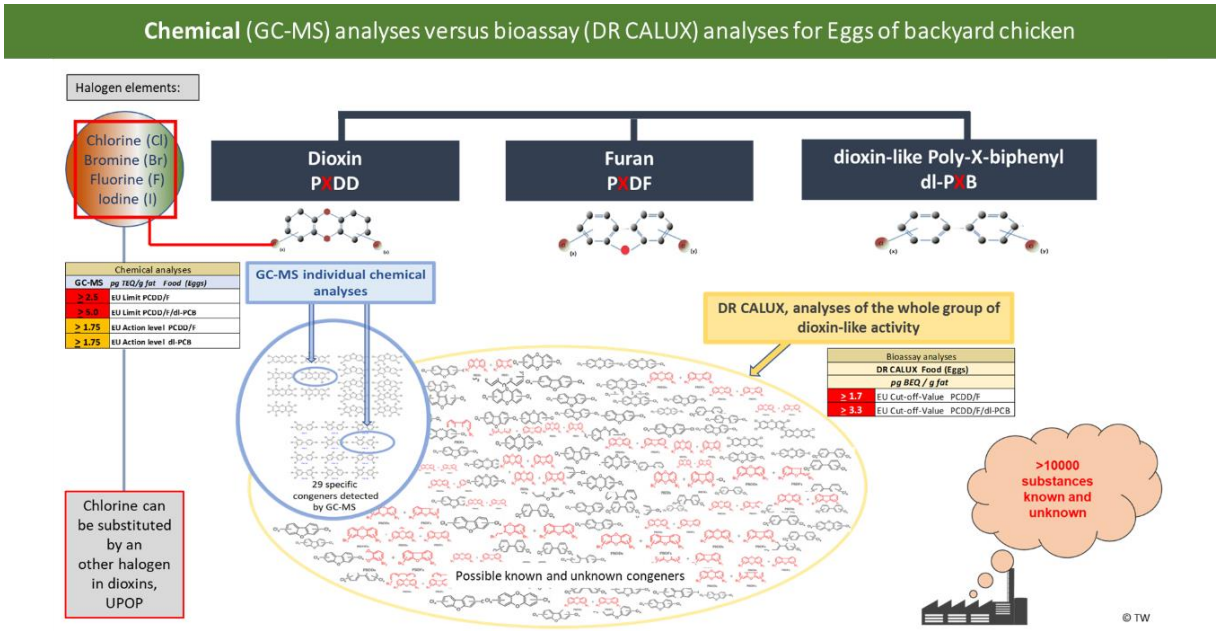
Roof dust samples weighing 50 grams were collected by direct scraping from a roof at location *Dvornìke*. At the location in *Zádiel*, roof dust that had naturally deposited in a metal bowl was sampled.

Water/Sediment

Water and sediment samples, totalling 200 ml water/sediment were collected directly from the downstream floating Bodvou, near the cement kiln using an HDPE lab container and stored cool and in a dark environment.

Analysis methods

The collected samples undergo analysis for persistent organic pollutants (POPs) using both bioassays (CALUX) and chemical analyses. The substances of interest are PCDD/F/dl-PCB (dioxins), Per- and poly-fluoroalkyl Substances (PFAS), Polycyclic Aromatic Hydrocarbons (PAH), and analyses of 6-14 heavy metals: Arsenic, Cadmium, Cobalt, Chromium, Lead, Nickel, Aluminium, Barium, Copper, Manganese, Mercury, Silver, Tin, and Zinc.
In this research, bioassay analysis employs DR CALUX® for dioxins/furans (PCDD/F) and dioxin-like PCBs (dL-PCBs), PAH CALUX for PAH substances, and FITC-T4 for the PFAS. Additionally, DR CALUX®, PFAS CALUX®, FITC-T4 and GC-MS are used for dioxins analysis in eggs, when results from DR CALUX exceed the EU Limits for eggs (1.7 pg BEQ/g fat for PCDD/F and 3.3. pg BEQ/g fat for the sum of dioxins (PCDD/F/dl-PCB)). The analysis is performed by BioDetection Systems in Amsterdam, the Netherlands (NL). BDS is accredited under RvA L401. Chemical analysis for PAH, PFAS and heavy metals are conducted by the accredited laboratory Normec, Groen Agro Control, located in Delft, the Netherlands (NL). PFAS chemical analyses employ LC-MS/MS to detect 24 PFAS, while heavy metals analysis utilises ICP-MS.



Results

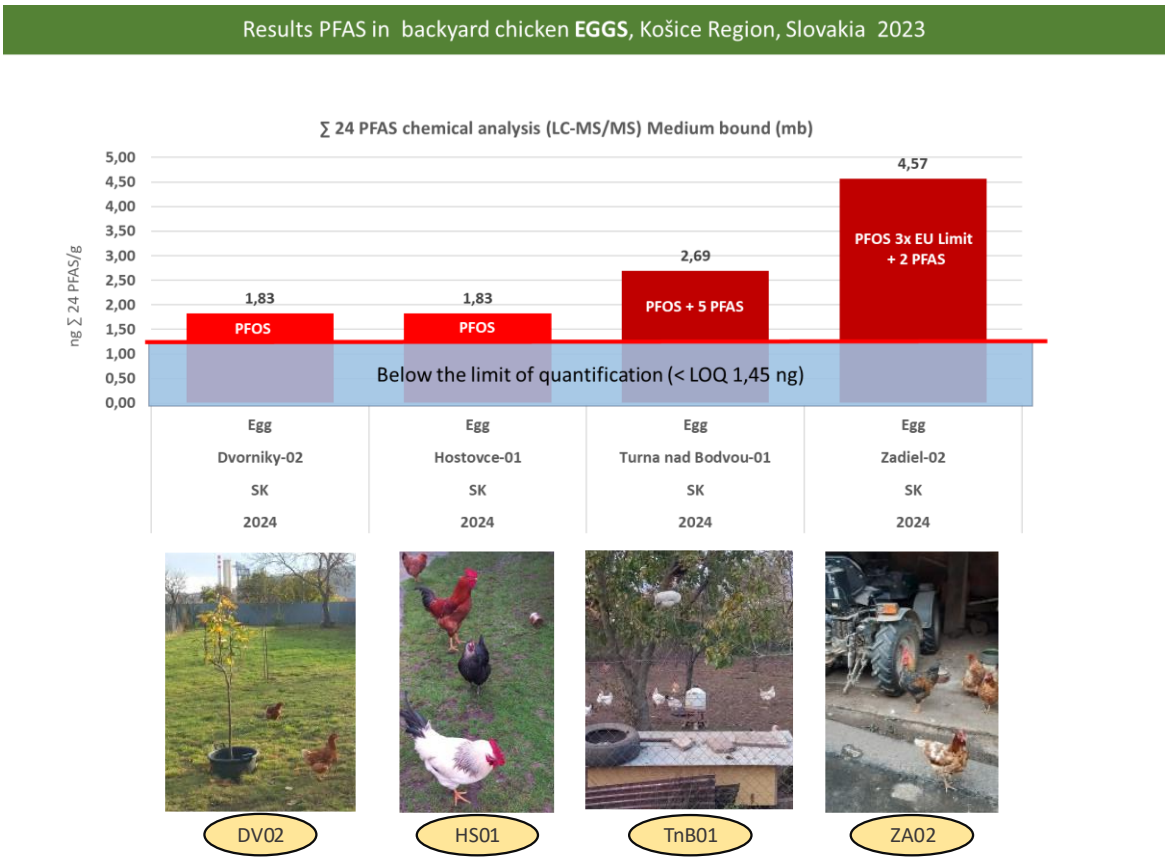
Eggs – Dioxins

In October 2023, TW sampled eggs from backyard chickens in six (6) private locations across five (5) neighbouring villages near the cement kiln. The values with the DR CALUX range from 1.2 – 9.8 pg BEQ/g fat. **Three (3) locations exceeded the EU limit** of 3.3 pg BEQ/g in backyard chicken eggs (DR CALUX), with **4.70 pg** in *Hosťovce*, **4.80 pg** in *Turňa nad Bodvou* and **9,80 pg BEQ/g fat (MB)**[5] in *Zádiel*. The DR CALUX method assesses the toxicity of dioxins, including brominated, fluorinated, and other (mixed) halogenated compounds. Chemical analyses, limited to 29 chlorinated dioxins, found in eggs of *Turňa nad Bodvou* **6.6 pg TEQ/g** and in eggs of location *Zádiel* **8.8 pg TEQ/g**. The levels of dl-PCB are from 0.1 – 6.7 pg TEQ/g. The highest-level dl-PCB is found in *Zádiel*. Chemical analysis confirmed this value with 6.6 pg TEQ/g in *Zádiel* and measured 3.9 pg TEQ/g in *Hosťovce*. Both exceed the EU action limit of 1.7 pg TEQ, where action is needed to determine the source. The congener patterns of dl-PCB closely resemble all these locations.

[5] *The concept which requires using half of the limit of quantification calculating the contribution of each congener*

Eggs – PFAS

Chemical analysis (LC-MS/MS) detected in all the eggs PFAS. The highest concentration of PFAS was also found at location Zádiel-02 with **4.57** µg ∑ 24 PFAS /kg (mb). Notably, the concentration of PFOS, one of the 4 EU-regulated PFAS compounds exceeds the EU limit by 300%: 3.0 µg/kg. In eggs at location Turňa nad Bodvou the PFOS level is 0.75 µg/kg, just below the EU limit. Remarkable is the finding of 6 different PFAS compounds at location Zádiel-02. The PFAS results in eggs are also reported as medium bound (MB).[6]



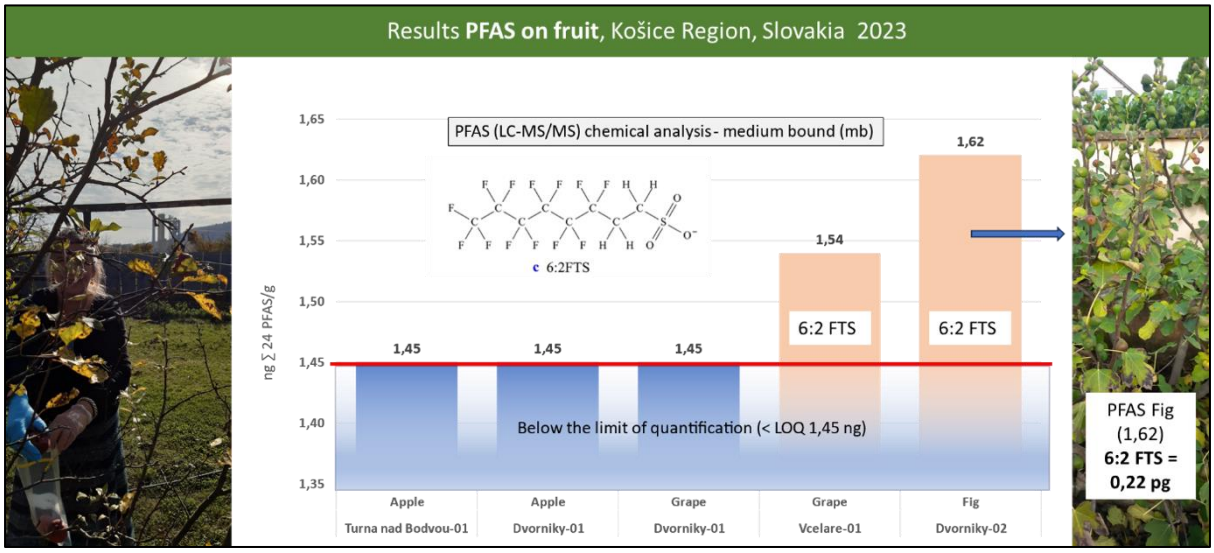
[6] *The concept which requires using half of the limit of quantification calculating the contribution of each congener*

Fruit

Dioxins on fruit in *Turňa nad Bodvou* consist of 0.24 pg TEQ/wet weight (MB) for the sum of dioxins (PCDD/F/dl-PCB) and are just below the EU limit of 0.30 pg TEQ.[7] Other locations measured all below the limit of quantification (<LOQ) for dioxins on fruit.

PFAS was detected in grapes in Včeláre, and fig leaves in *Dvornìke,* with 0.14 and 0.22 ng /gram dw (MB) for 6:2 Fluorotelomer sulfonate (6:2FTS), respectively. In the other locations, no PFAS could be found above the limit of quantification (>LOQ). Although the presence of 6:2 Fluorotelomer sulfonate (6:2FTS) is with great concern, because of the threat of serious health effects, and accumulation potential in people, this PFAS is (still) not included in the EU regulations.

The PAH levels on apples are 2.34 – 19.69 ng Benzo(a)Pyrene equivalent per gram/product with the PAH CALUX. The highest level was found in *Turňa nad Bodvou.* In grapes of *Dvornìke,* and *Včeláre* 19.1 ng and 32.5 ng ∑16 PAH was found with the chemical analysis of GCMS.



Mosses

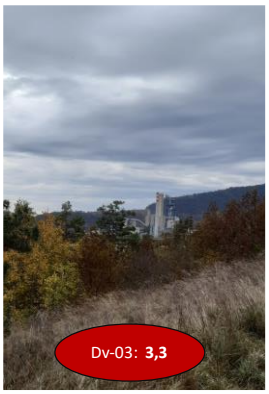
The values of dioxins measured with DR CALUX in mosses at *Dvornìke* are 3.3 pg TCDD eq./g, in mosses at the top of the hill north, and 23.8 pg TCDD eq./g in mosses on a roof 800 meters distance from the plant. Mosses collected from roofs in *Včeláre* dioxins measured 6.4 pg TCDD eq./g, in *Zádiel* 10.8 pg TCDD eq./g, and *Hosťovce* 19.0 pg TCDD eq./g dw (MB). The dioxin in all the moss samples exceeds the limit (for feed) of 0.83 pg TCDD eq./g 88% dry weight (medium bound, MB). High levels of dioxins were detected in all moss samples collected around the cement kiln. The levels of dioxins (PCDD/F/dl-PCBs) in mosses of Slovakia are among the highest observed in international biomonitoring research conducted by TW. Follow-up research in 2024 on moss in this Slovak area will expand to include moss samples from the Slovak Karst National Park region.

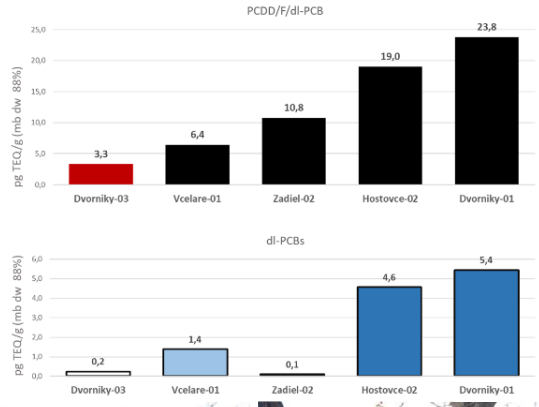
In the mosses of *Hosťovce* and *Dvornìke*, values of 4.6 and 5.4 pg dl-PCB are found. Semi-continuous measurements of the flue gases are needed to determine the amount and patterns of emissions of dl-PCB by the cement kiln. In *Zádiel*, *Dvornìke (Hill North)* and *Včeláre* 0.1, 0.2 and 1.4 pg TCDD eq./g were measured respectively. Notably, mosses exhibited higher levels of dioxins when compared to fruits or pine needles collected from the same locations. This disparity might be attributed to the fact that fruits mature from blossom to ripe fruit within a few months (May-September) and mosses grow continuously throughout the year and can live for many years.

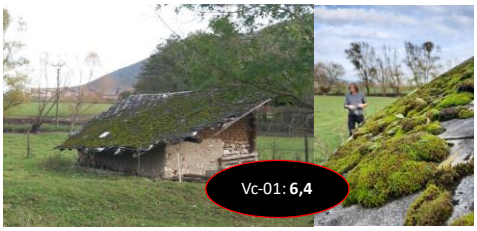
[7] *2013/711/EU*

PAH in mosses varies from 355.4 - 4684.7 ng/g Benzo(a)pyrene equivalent with the PAH CALUX. The chemical analysis tool of the GC-MS on 16 PAH is in the range of 32.5 – 423 ng PAH/g. The lowest level of PAH is found at the top of the hill in *Dvornìke,* and the highest is found in *Hosťovce*. The bioassay PAH CALUX method measures the toxicity of the total PAH instead of 4-16 PAH congeners with chemical analyses (GC-MS).

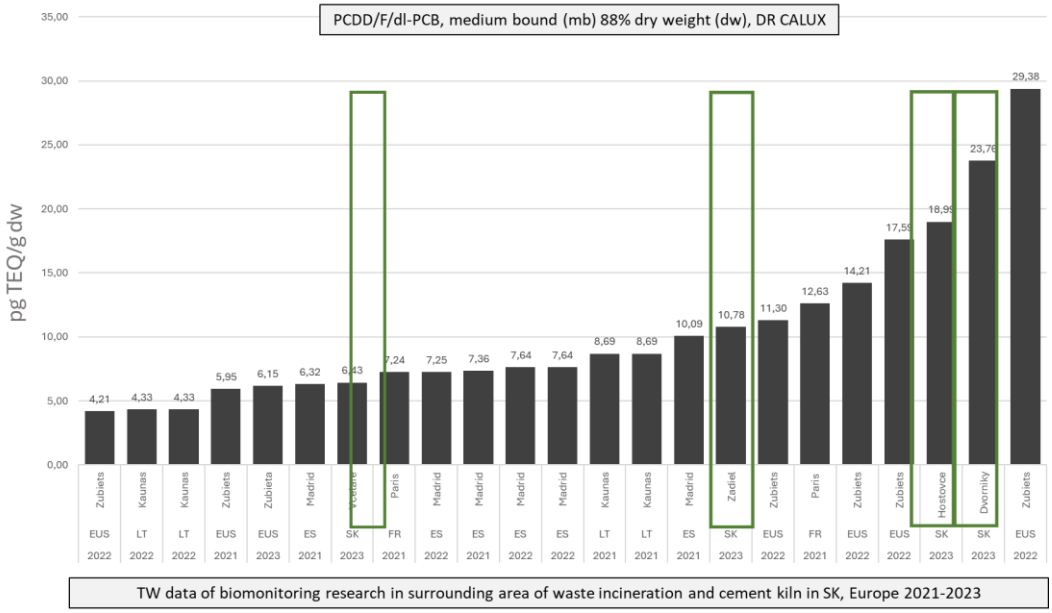
Dioxins in mosses Košice Region, Slovakia 2023





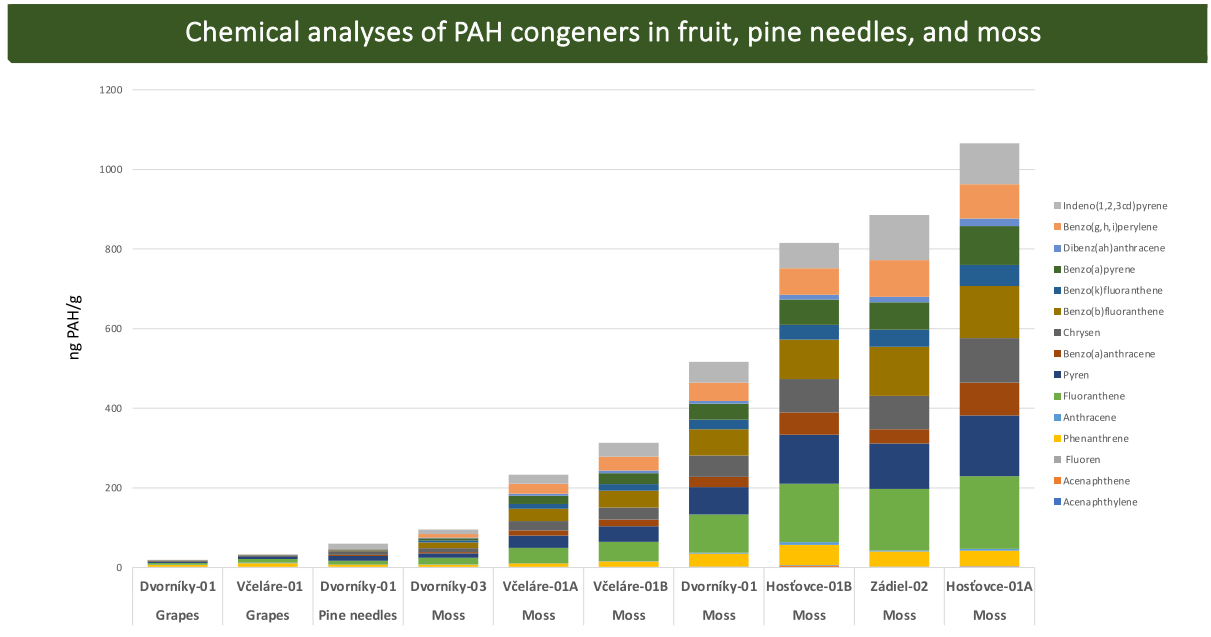


Mosses: Results dioxins, Slovakia 2023 compared with mosses in EU countries



Pine needles

The levels of dioxins in pine needles measured with the bioassay DR CALUX are 0.77 pg TCDD eq./g in *Dvornìke*, 1.52 pg TCDD eq./g in *Zádiel* and 2.85 pg TCDD eq./g in *Hosťovce* and *Včeláre*. PAH levels at these 4 locations in pine needles are 0.08 – 2.16 ng Benzo(a)Pyrene equivalent/g by PAH CALUX. The chemical method of PAH analyses measured a substantially higher level of 60.1 ng ∑ 16 PAH/g in pine needles at a location in *Dvornìke*.



Roof dust

Residents had reported concern about black dust accumulating on their roofs, windows, and windowpanes. In this research, high levels of PAH were found in roof dust sampled directly from a roof at location *Dvornìke*, and from a metal bowl below the roof with naturally deposited dust in *Zádiel*. Dioxin levels in dust are 5.50 TCDD eq./g in *Dvornìke* and 6.30 pg TCDD eq./g in *Zádiel*. The dl-PCBs are 1.20 and 2.20 TCDD eq./g, respectively.

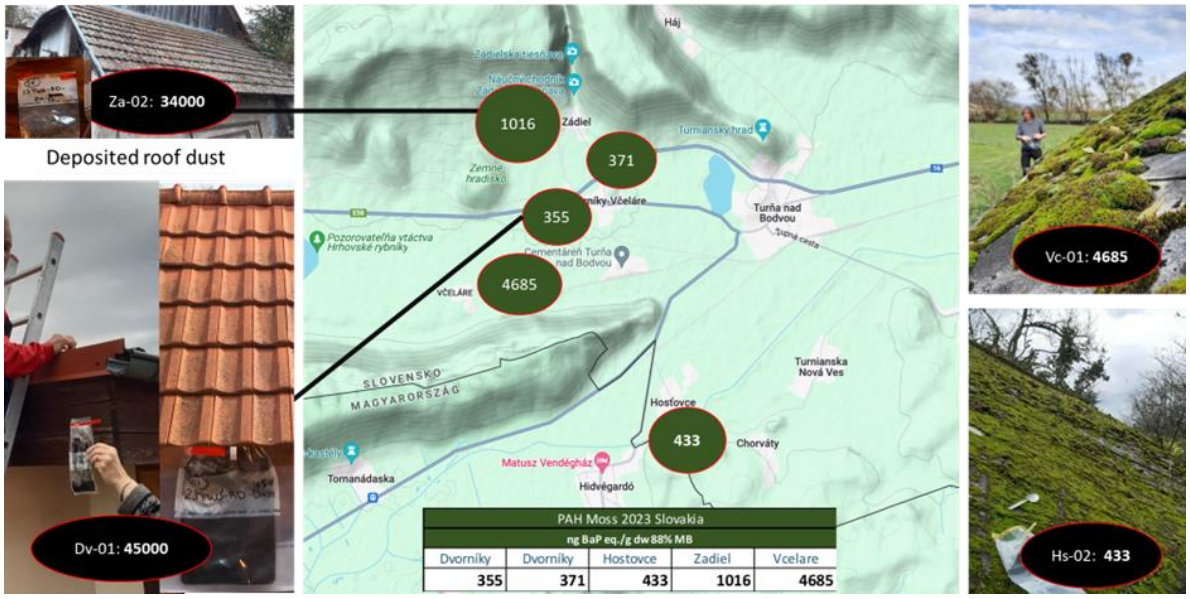
The levels of PAH in *Zádiel* were 34,000 ng and in *Dvornìke* 45,000 ng Benzo(a)Pyrene equivalent per gram. However, on apples and grapes, much lower levels in the range of 0.32 – 2.50 ng Benzo(a)Pyrene equivalent per gram is found in uncleaned fruit samples.

Results (sampling October-November), Košice Region , Slovakia 2023

							Dioxins DR CALUX (mb)			medium bound (mb)
Date	Total	Samples	Location Village	Biomarker	TW-RF-NR	Analyse	PCDD/F	dl-PCB	PCDD/F/dl-PCB	PAH
							DR CALUX	DR CALUX	DR CALUX	PAH CALUX
Sample	loc. / BioMat.				2023	Method	1.7		3.3.	Benzo[a]pyrene equivalent
							pg BEQ (TCDD)/g fat (veg: product)			ng BaP eq./g product
		Roof dust								
30-10-2023	1	Roof dust	Dvornike - Loc. 1		23TWS-RD-Dv01	DR CALUX	5,10	1,20	6,30	
		Roof dust	Dvornike - Loc. 1		23TWS-RD-Dv01	PAH CALUX				45000,00
31-10-2023	2	Roof dust	Zádiel - Loc. 2		23TWS-RD-Za02	DR CALUX	3,30	2,20	5,50	
		Roof dust	Zádiel - Loc. 2		23TWS-RD-Za02	PAH CALUX				34000,00

TW Indicative scale Vegetation / (Feed)			TW Indicative scale Results
DR CALUX (medium bound)			PAH CALUX (mb)
PCDD/F	dl-PCB	(PCDD/F/dl-PCB)	Benzo[a]pyrene equivalent
pg TCDD eq./g dry weight (dw)			ng BaP eq./g product
≥ 2.5	≥ 2.5	≥ 3.32	> 500 ng
≥ 1.0	≥ 1.0	≥ 1.66	> 250 ng
≥ 0.5	≥ 0.5	≥ 0.83	≥ 100 ng
< 0.5	< 0.5	< 0.83	≥ 10 ng
			< 10 ng

Results PAH in roof dust and mosses, Košice Region , Slovakia 2023



PAH Moss 2023 Slovakia

ng BaP eq./g dw 88% MB

Dvorníky	Dvorníky	Hostovce	Zadiel	Vcelare
355	371	433	1016	4685

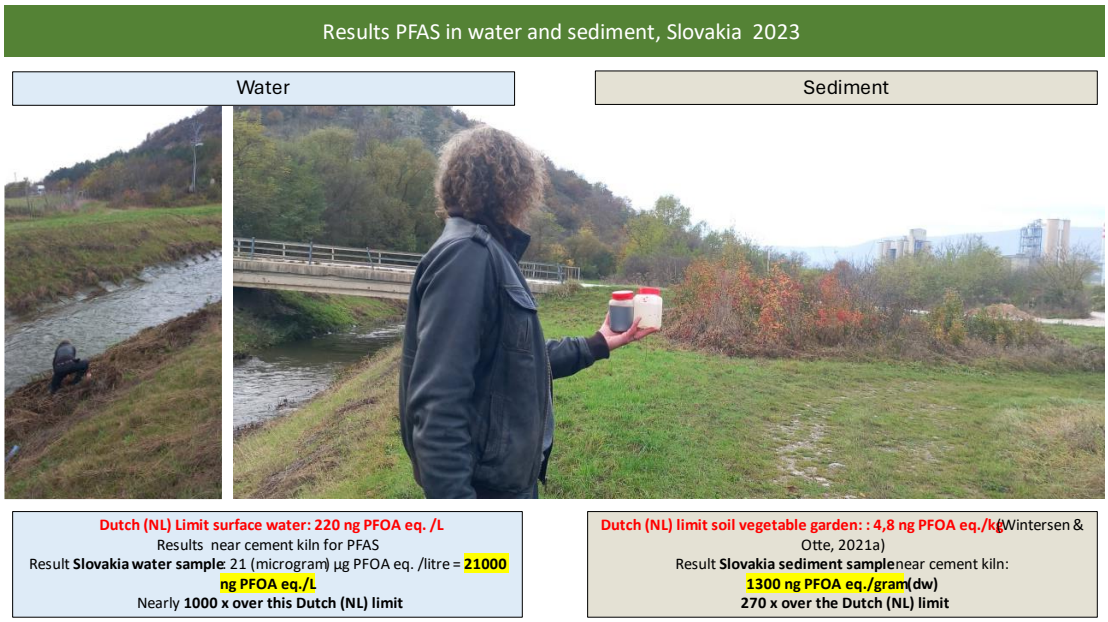
Water / Sediment

A screening test with the FITC-T4 was conducted on water and sediment near the cement kiln. The level of PFAS in water was found to be **21,000 ng PFOA.eq. /l**. This result exceeds the Dutch limit of **0.3 nanograms per litre for PFOA** by **more than a factor of 70,000**.[8] The FITC-T4 is a method that measures the total toxic effect of a mixture of PFAS congeners and is currently used by the Dutch government to screen for PFAS in surface water and inform policy measures for source reduction.

Results (sampling October-November), Košice Region , Slovakia 2023								
Date	Total	Samples	Location Village	Biomarker	TW-RF-NR	Analyse	PFAS: FITC-T4 (mb)	
							Sediment	water
Sample	loc. / BioMat.				2023	Method	ng PFOA eq./ g	µg PFOA eq./ lt
	Water / Sediment							
31-10-2023	1	Water	Hosťovce/border Hungaria/ CK Loc. 1		23TWS-H2O-CK-01	PFAS / FITC-T4		21,00
31-10-2023	2	Sediment	Hosťovce/border Hungaria/ CK Loc. 1		23TWS-SED-CK-01	PFAS / FITC-T4	1,30	

TW Indicative scale	
Bioassay FITC-4 (PFAS)	
Sediment	water
ng PFOA eq./ g	µg PFOA eq./ lt
≥ 0,0768 ng	≥ 1,76 µg
≥ 0,0384 ng	≥ 0,88 µg
≥ 0,0192 ng	≥ 0,44 µg
≥ 0,0096 ng	≥ 0,22 µg
< 0,0048 ng	< 0,22 µg

Sediment sampling downstream showed PFAS levels of **1,300 ng PFOA eq./g (dry weight)** with the method of FITC-T4. The Dutch regulation for soil is set at 0.048 ng PFOA eq./g. The result **greatly surpasses the Dutch regulation for soil**. Further research is necessary on water and sediment samples, as well as upstream samples in the Slovak Karst National Park to find out the extent of the pollution and if it is structural or an accidental disposal. Extended analyses will employ chemical analysis LC-MS/MS and the bioassay ERA-CALUX.



[8] *Smit C.E., Verbruggen E.M.J. (2022). Risicogrenzen voor PFAS in oppervlaktewaterRIVM-briefrapport 2022-0074 C.E. Smit | E.M.J. Verbruggen*

Heavy metals

The results of analyses of heavy metals on mosses (*Bryophyta*) in *Zádiel are* 6293 mg/kg Zinc, 76 mg/kg Lead, 71 mg/kg Nickel, 918 mg/kg Manganese, 22 mg/kg Copper and 2.2 mg/kg Cadmium at location *Zádiel*. More research at reference locations is needed to interpret the results in the context of this region. The heavy metals levels in the mosses are among the highest recorded in biomonitoring research conducted by TW in Europe (2019-2023). In Annexe 7 the results in Slovakia are indicated in boxes for comparative results in Europe. Subsequent samples of mosses will be collected in the nearby Slovak Karst National Park and AGGTELEK National Park, located very close to the cement kiln in Hungary.

In pine needles - *Picea abies* in *Zádiel*, 592 mg/kg of Manganese is found. This result is high, compared to other TW-biomonitoring results in pine needles. Heavy metal analysis of eggshells of backyard chickens found 0.024 mg/kg Lead (Pb), 0.056 mg Nickel (Ni) and no Mercury (Hg) was detected above the limit of detection (< LOD). A relatively high content of Aluminium (Al) of 8.3 mg/kg in eggshells of *Dvornìke* needs to have more attention.

Results Heavy Metals in Pine needles, Mosses and Eggshells

Heavy Metals mg/kg - Medium Bound (mb = LOD/2)

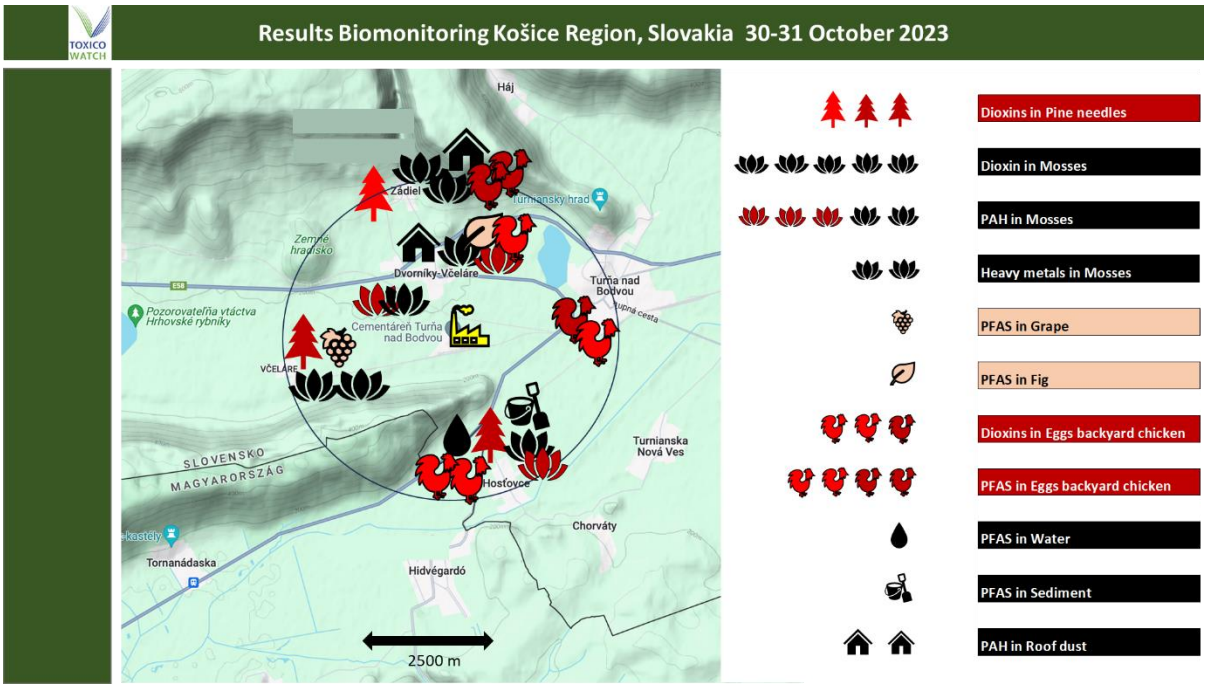
TW-REF-NR	1	2	3	4	5	6	7	8	9	10	11	12	13	14
	As	Al	Ba	Cd	Cr	Co	Cu	Pb	Mn	Hg	Ni	Ag	Sn	Zn
	Arsenic	Aluminium	Barium	Cadmium	Chromium	Cobalt	Copper	Lead	Manganese	Mercury	Nickel	Silver	Tin	Zinc
23TWS-PN-HS02	0,066	99,000	67,000	0,005	0,280	0,061	4,800	0,330	591,000	0,026	0,280	0,005	0,040	41,000
23TWS-PN-VC02	0,083	155,000	61,000	0,011	0,330	0,025	3,100	0,410	13,000	0,028	0,240	0,005	0,053	36,000
23TWS-MOS-HS02	3,900	8789,000	141,000	1,300	23,000	17,000	26,000	47,000		0,086	26,000	0,110	2,200	135,000
23TWS-MOS-ZA01	4,500	14727,000	216,000	2,200	64,000	32,000	22,000	76,000	918,000	0,110	71,000	0,150	3,500	6293,000
23TWS-ES-Dv-02	0,010	8,300		0,005				0,024		0,005	0,056			

Conclusion

The infographic below presents the initial findings from the TW biomonitoring research conducted around the cement kiln Cementáreň Turňa nad Bodvou situated in the Košice Region in Slovakia in 2023. Samples were taken within a radius of 2500 meters around the kiln, in the surrounding of five (5) villages and analysed for persistent organic pollutants (POPs), such as dioxins, PFAS, PAH and heavy metals. Eggs, pine needles, and mosses exhibited high concentrations of dioxins (PCCD/F/dl-PCB), polycyclic aromatic hydrocarbons (PAHs), and per- and poly-fluoroalkyl substances (PFAS). In *Turňa nav Bodvou* six (6) PFAS compounds could be determined in eggs. PFOS level in eggs of location Zádiel- exceeding the EU limit for PFOS by 300%.

Of particular concern are the screening test results in the surface water stream near the cement kiln and sediment for the alarmingly high levels of PFAS. The heavy metal levels in mosses are among the highest recorded in TW-biomonitoring research conducted in Europe (2019-2023). Additionally, elevated levels of PAH were found in dust depositions on the roofs of houses in the villages of *Dvornìke* and *Zádiel*.

Overall, the findings from this initial biomonitoring project raise worrying concerns regarding the presence of dioxins (PCDD/F/dl-PCB), PAH, PFAS and heavy metals in the environment of this region of the Košice. Further research is imperative to comprehend these contaminants' source(s) and deposition patterns.



Annexe

Annexe 1: Analysis methods

The biomarkers underwent analysis for persistent organic pollutants (POPs), like dioxins (PCDD/F/dl-PCB), Per- and polyfluoroalkyl Substances (PFAS), and Polycyclic Aromatic Hydrocarbons (PAH).[9] The analyses were conducted using both bioassays and chemical analyses.

The DR CALUX bioassay® (Dioxin Responsive Chemical Activated Luciferase gene eXpression) was used to quantify dioxins/furans (PCDD/F) and dioxin-like PCBs (DL-PCBs). Results from DR CALUX® are reported in Bioassay Equivalent units, BEQ (pg BEQ/g fat). The term "BEQ" distinguishes results obtained from food samples from those obtained via chemical analysis (Gas Chromatography-Mass Spectrometry GC-MS, pg TEQ/g fat) which are reported in Toxic Equivalence (TEQ) units (pg TEQ/gfat). For non-food biomatrices like mosses or pine needles, results from DR CALUX are expressed in TCDD equivalent per gram of product (TCDD eq./g product) or abbreviated as pg TEQ/g product. The congener of TCDD refers to 2,3,7,8-Tetrachlorodibenzo-p-dioxin, as the most toxic dioxin congener.

Chemical analysis by GCMS is conducted if the BEQ values from DR CALUX exceed the limit of 3.3 pg BEQ/g fat for PCDD/F/dl-PCB or 1.7 pg BEQ/g fat for PCDD/F. This analysis covers 7 dioxins (PCDDs), 10 furans (PCDFs) and 12 dioxin-like polychlorinated biphenyls (DL-PCBs). The maximum limit value for dioxins in eggs is set at 2.5 pg TEQ/g fat for PCDD/F, with the sum of dioxins and dioxin-like PCBs (dl-PCBs) limited to 5 pg TEQ/gram fat).

The action levels for GC-MS analysis of dioxins (PCDD/F) and dioxin-like PCBs (DL-PCBs) in hen eggs, established by 2013/711/EU[10]are set at 1.75 pg TEQ/g fat. See Figure 5. These action levels aid competent authorities and operators in identifying contamination sources and implementing necessary measures for reduction or elimination.

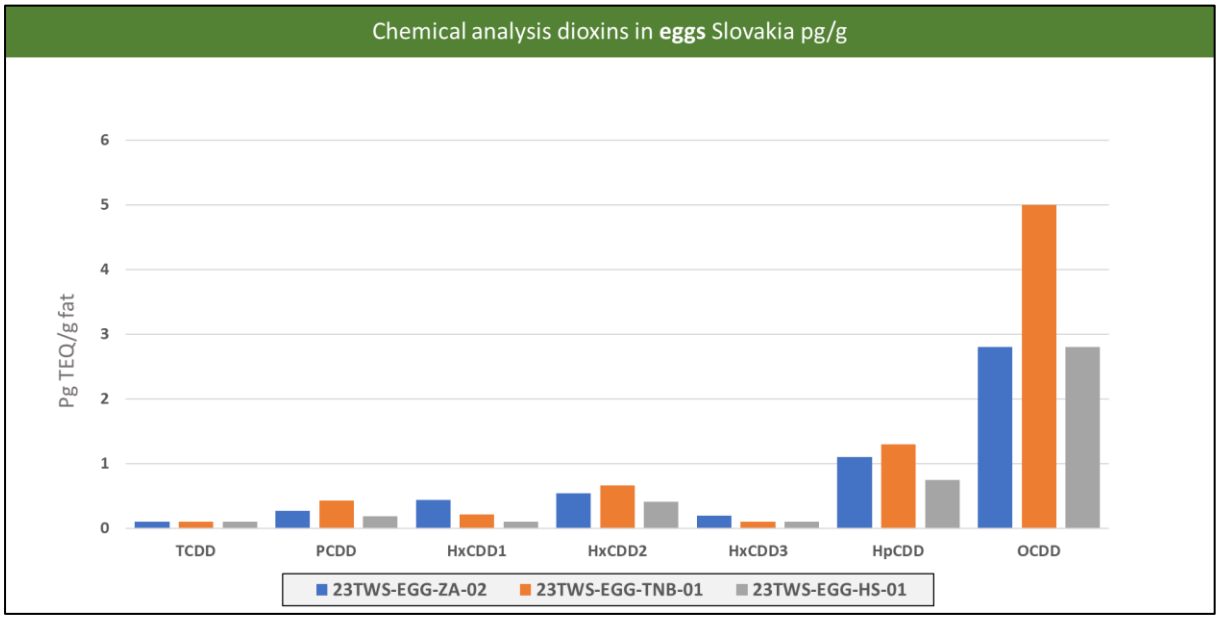
PAH analysis is performed using the PAH CALUX assay, with results expressed in benzo[a]pyrene equivalency (B(a)P). PFAS analyses utilise FITC-T4assay, measuring the binding potency with thyroid hormone thyroxine (T4) and plasma transport protein Transthyretin (TTR) This assay involves fluorescent-labelled thyroxine (FITC-T4), consisting of fluorescein isothiocyanate (FITC) and L-thyroxine (T4), where the measurement is based on fluorescence differences between bound and non-bound FITC-T4 at the TTR-binding site. results from FITC-T4 analysis are reported in µg PFOA equivalent per gram of product (PFPA/g product.

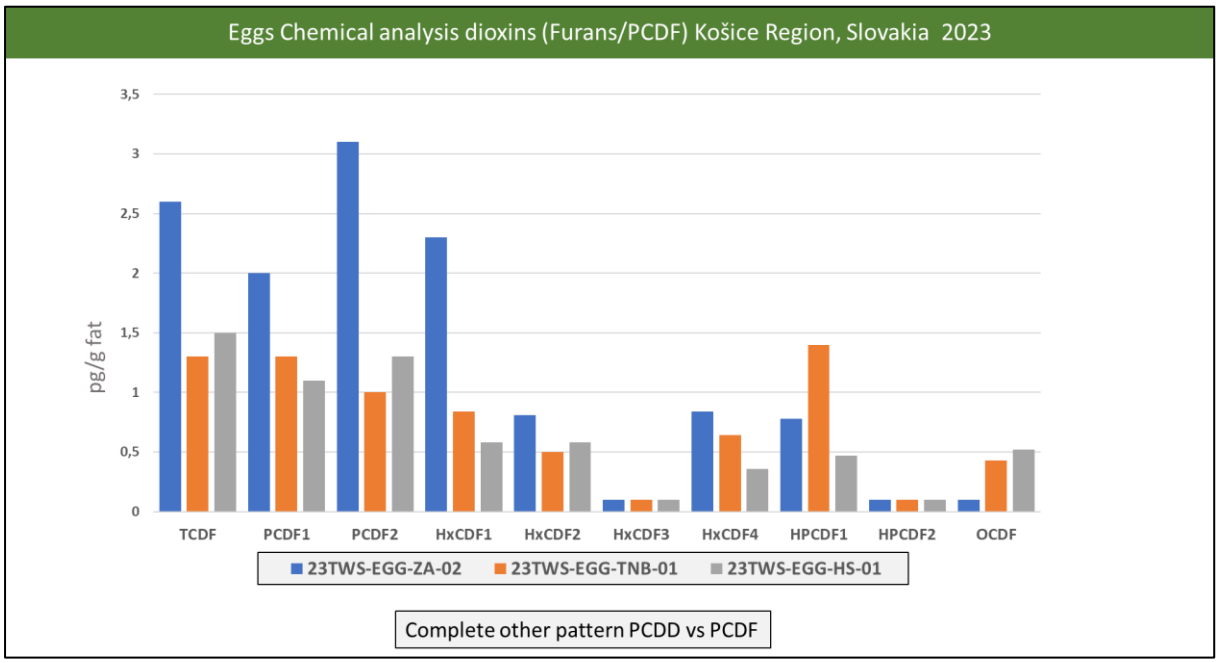
The DR CALUX®, PFAS CALUX®, FITC-T4 and GC-MS analyses on dioxins, are performed by BioDetection Systems, Amsterdam, the Netherlands, accredited under RvA L401.

PFAS chemical analyses were performed on 24 PFAS using LC-LC-MS (A195), PAH with GC-MS/MS and the analyses of heavy metals with ICP-MS (A068+A095) were performed by Normec, Rotterdam NL, the Netherlands.

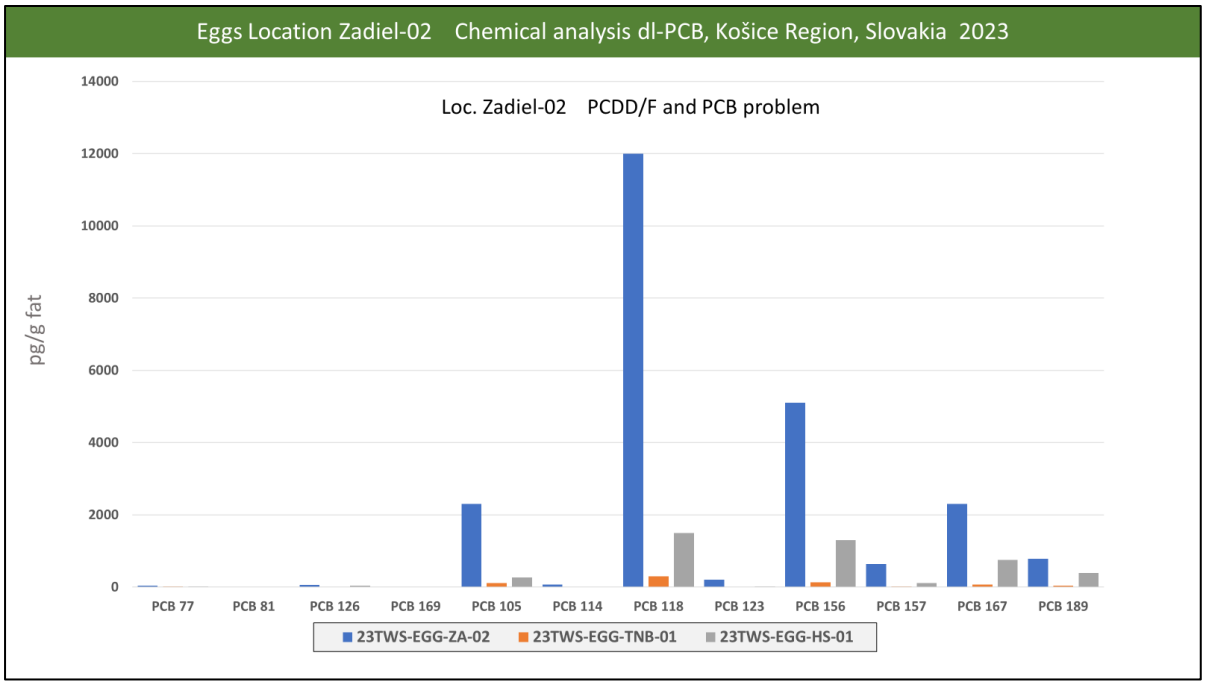
[9] The term POP is used to refer to toxic chemicals that are resistant to degradation processes, travel over long distances, and bioaccumulate in the human body and ecosystems.

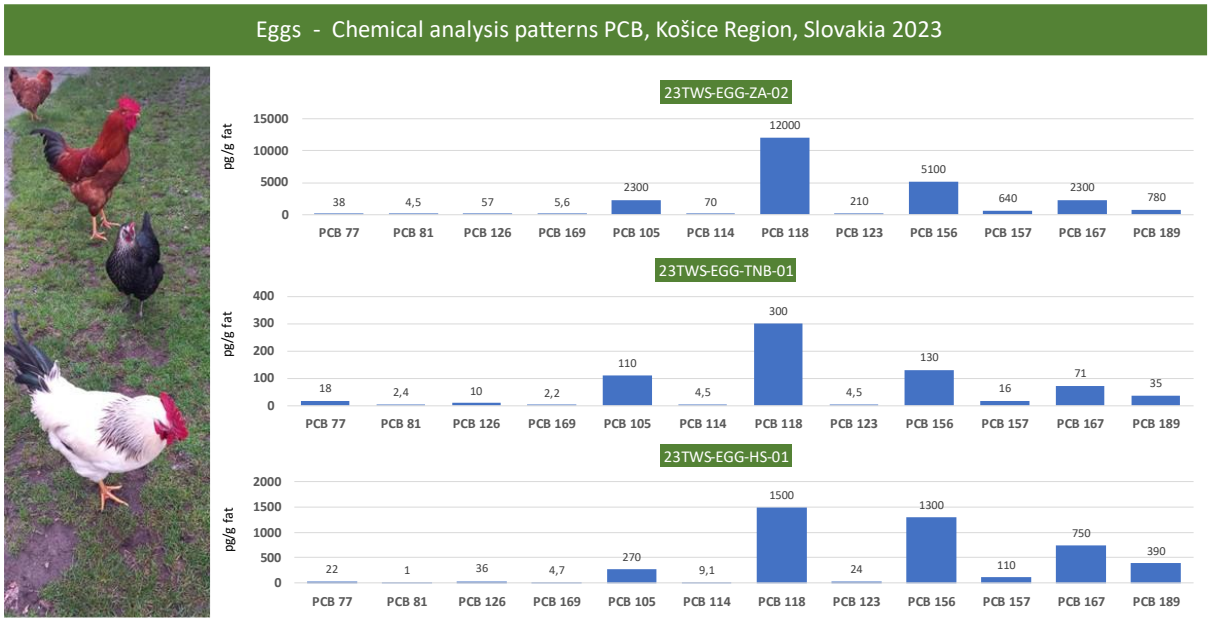
Annexe 2: Results GC-MS analyses on eggs of backyard chicken





Annexe 3: Dl-PCB





Annexe 4: Dioxins and PFAS in eggs

Results Eggs (sampling October-November), Košice Region, Slovakia 2023

Date	Total	Location Village	Biomarker	TW-RF-NR	Analyse	Dioxins DR CALUX (mb) PCDD/F DR CALUX	Dioxins DR CALUX (mb) dl-PCB DR CALUX	Dioxins DR CALUX (mb) PCDD/F/dl-PCB DR CALUX	Dioxins GC-MS (mb) PCDD/F GC-MS-ub	Dioxins GC-MS (mb) dl-PCB GC-MS	Dioxins GC-MS (mb) PCDD/F/dl-PCB GC-MS	PFAS LC-MS/MS ∑ 4 PFAS	PFAS LC-MS/MS ∑ 24 PFAS	Heavy Metals
Sample	loc. / BioMat			2023	Method	1.7		3.3.	2.5		5.0	∑ 4 PFAS	∑ 24 PFAS	14
						medium bound (mb)			1.75	1.75		medium bound (mb)		
Sampling date						pg BEQ (TCDD)/g fat (veg: product)			pg TEQ/g fat (veg: product)			µg / kg - ng/g	µg / kg - ng/g	
30-10-2023	1	Dvornike - Loc. 2		23TWS-Egg-Dv-07	DR CALUX	1,00	0,20	1,20						
		Dvornike - Loc. 2		23TWS-Egg-Dv-07	LC-MS/MS							0,58	1,83	
		Dvornike - Loc. 2 (eggshell)		23TWS-Egg-Dv-07	Heavy Metals									6 HM
30-10-2023	2	Včelâre - Loc. 2		23TWS-Egg-Vc-01	DR CALUX	1,60	0,10	1,70						
30-10-2023	3	Zádiel - Loc. 1		23TWS-Egg-Za-01	DR CALUX	0,65	1,05	1,70						
31-10-2023	4	Zádiel - Loc. 2		23TWS-Egg-Za-02	DR CALUX / GC-MS	3,10	6,70	9,80	2,2	6,6	8,80			
		Zádiel - Loc. 2		23TWS-Egg-Za-02	LC-MS/MS							3,15	4,57	
30-10-2023	5	Turňa nad Bodvou - Loc. 1		23TWS-Egg-TnB-01	DR CALUX / GC-MS	2,70	2,10	4,80	1,3	1,1	2,50			
		Turňa nad Bodvou - Loc. 1		23TWS-Egg-TnB-01	LC-MS/MS							0,98	2,69	
31-10-2023	6	Hosťovce Loc. 1		23TWS-Egg-Hs-01	DR CALUX / GC-MS	2,20	2,50	4,70	1,1	3,9	4,90			
		Hosťovce Loc. 1		23TWS-Egg-Hs-01	LC-MS/MS							0,58	1,83	

						EU regulation (Upperbound - ub)		
						Chemical PFAS (LC-MS/MS)		
TW Indicative scale for Eggs			TW Indicative scale for Eggs			Eggs (1-1-2023)		
DR CALUX			GC-MS			EU Limit	TW Indicative	Heavy Metals
PCDD/F	dl-PCB	(PCDD/F/dl-PCB)	PCDD/F	dl-PCB	(PCDD/F/dl-PCB)	∑ 4 PFAS (EFSA)	∑ 24 PFAS	
pg BEQ / g fat			pg TEQ /g fat			µg / kg - ng/g		
≥ 6.6	≥ 2.5	≥ 10	≥ 7.5		≥ 15.0	≥ 5.1	≥ 5.1	
≥ 3.3	≥ 1.0	≥ 6.6	≥ 5.0		≥ 10.0	≥ 2.4	≥ 2.4	
≥ 1.7	≥ 0.5	≥ 3.3	≥ 2.5	≥ 1.75	≥ 5.0	≥ 1.7	≥ 1.7	
< 1.7	< 0.5	< 3.3	< 2.5	< 1.75	< 5.0	< 1.7	< 1.7	

Annexe 5: Fruit –Dioxins, PAH and PFAS

Sampling October-November, Košice Region , Slovakia 2023

Date	Total	Samples	Location Village	Biomarker	TW-RF-NR	Analyse	Dioxins DR CALUX (mb) PCDD/F DR CALUX	dl-PCB DR CALUX	PCDD/F/dl-PCB DR CALUX	medium bound (mb) PAH PAH CALUX	medium bound (mb) 4 PAH GC-MS/MS	medium bound (mb) 16 PAH GC-MS/MS	medium bound (mb) PFAS LC-MS/MS ∑ 4 PFAS	∑ 24 PFAS
Sample	loc. / BioMat				2023	Method	1.7		3.3.					
							pg BEQ (TCDD)/g fat (veg: product)			Benzo(a)pyrene equivalent ng BaP eq./g product	∑ 4 PAH ng / g	∑ 16 PAH ng / g	medium bound (mb) µg / kg - ng / g	µg / kg - ng/g
	Fruit / Vegetables						FOOD / Fruit/ Apples (Wet Weight / ww)							
30-10-2023	1	Apples (pulp)	Dvornike - Loc. 1		23TWS-APu-Dv01	DR CALUX	0,03	0,03	0,05					
		Apples (pulp)	Dvornike - Loc. 1		23TWS-APu-Dv01	PAH CALUX				0,67				
		Apples (pulp)	Dvornike - Loc. 1		23TWS-APu-Dv01	LC-MS/MS								1,45
		Grape	Dvornike - Loc. 1		23TWS-Grp-Dv01	LC-MS/MS								1,45
		Grape	Dvornike - Loc. 1		23TWS-Grp-Dv01	PAH GC-MS/MS					2,0	19,1		
30-10-2023	2	Apples (pulp)	Dvornike - Loc. 2		23TWS-Apu-Dv02	DR CALUX	0,03	0,03	0,05					
		Apples (pulp)	Dvornike - Loc. 2		23TWS-APu-Dv02	PAH CALUX				0,40				
1-11-2023		Fig	Dvornike - Loc. 2		23TWS_Fig-02-Dv02	LC-MS/MS								1,62
	3	Grape	Včeláre - Loc. 2		23TWS-Grp-Vc01	PAH GC-MS/MS					2,7	32,5		
30-10-2023		Apples (pulp)	Včeláre - Loc. 2		23TWS-APu-Vc03	DR CALUX	0,03	0,03	0,05					
		Apples (pulp)	Včeláre - Loc. 2		23TWS-APu-Vc03	PAH CALUX				0,32				
		Grape	Včeláre - Loc. 2		23TWS-Grp-Vc01	LC-MS/MS								1,54
31-10-2023	4	Apples (pulp)	Turňa nad Bodvou - Loc. 1		23TWS-APu-TnB01	DR CALUX	0,18	0,03	0,21					
		Apples (pulp)	Turňa nad Bodvou - Loc. 1		23TWS-APu-TnB01	PAH CALUX				2,50				
		Apples (pulp)	Turňa nad Bodvou - Loc. 1		23TWS-APu-TnB01	LC-MS/MS								1,45

	TW Indicative scale Vegetation / (Feed) DR CALUX PCDD/F	dl-PCB	(PCDD/F/dl-PCB)	TW Indicative scale PAH CALUX Benzo(a)pyrene equivalent	PAH GC-MS/MS ∑ 4 PAH	TW Ind. Scale PAH GC-MS/MS ∑ 16 PAH	TW Indicative scale PFAS LC-MS/MS ∑ 4 PFAS (EFSA)	∑ 24 PFAS
	pg TCDD eq./g dry weight (dw)			ng BaP eq./g product	ng/g product	ng/g product	µg / kg - ng / g	
	≥ 2.5	≥ 2.5	≥ 3.32	> 500 ng	> 500 ng	> 500 ng	≥ 5,1	≥ 5,1
	≥ 1.0	≥ 1.0	≥ 1.66	> 250 ng	> 250 ng	> 250 ng	≥ 3,4	≥ 3,4
	≥ 0.5	≥ 0.5	≥ 0.83	≥ 100 ng	≥ 100 ng	≥ 100 ng	≥ 1.7	≥ 1.7
	< 0.5	< 0.5	< 0.83	≥ 10 ng	≥ 10 ng	≥ 10 ng	< 1,45	< 1,45
				< 10 ng	< 10 ng	< 10 ng	< 1,45	< 1,45

Annexe 6: Pine needles - Dioxins, PAH, and Heavy Metals

Re+R20+E2:R29+R20+E2:R29+E2:R30+E2:R32+E2:R30+R20+E2:R29														
							Dioxins DR CALUX (mb)			medium bound (mb)	medium bound (mb)			
Date	Total	Samples	Location Village	Biomarker	TW-RF-NR	Analyse	PCDD/F	dl-PCB	PCDD/F/dl-PCB	PAH	4 PAH	16 PAH		
							DR CALUX	DR CALUX	DR CALUX	PAH CALUX	GC-MS/MS	GC-MS/MS	Heavy Metals	
Sample	loc. / BioMat.				2023	Method	1.7		3.3.					
							DR CALUX (dw), 88 %			Benzo(a)pyrene equivalent	∑ 4 PAH	∑ 16 PAH	14	
							pg BEQ (TCDD)/g fat (veg: product)			ng BaP eq./g product	ng / g	ng / g		
		Vegetation Pine needles												
30-10-2023	1	Pine needles - *Picea abies*	Dvornike - Loc. 1		23TWS-PN-Dv01	DR CALUX	0,22	0,56	0,77					
		Pine needles - *Picea abies*	Dvornike - Loc. 1		23TWS-PN-Dv01	PAH CALUX				2,16				
		Pine needles - *Picea abies*	Dvornike - Loc. 1		23TWS-PN-Dv01	PAH GC-MS/MS					14,1	60,1		
30-10-2023	2	Pine needles - *Picea abies*	Včeláre - Loc. 2		23TWS-PN-Vc01	DR CALUX	1,29	1,56	2,85					
		Pine needles - *Picea abies*	Včeláre - Loc. 2		23TWS-PN-Vc01	PAH CALUX				0,79				
		Pine needles - *Picea abies*	Včeláre - Loc. 3 (near CK)		23TWS-PN-Vc02	Heavy Metals							14	
31-10-2023	3	Pine needles - *Picea abies*	Zádiel - Loc. 1		23TWS-PN-Za01	DR CALUX	0,61	0,92	1,52					
		Pine needles - *Picea abies*	Zádiel - Loc. 1		23TWS-PN-Za01	PAH CALUX				0,08				
31-10-2023	4	Pine needles - *Picea abies*	Hosťovce - Loc. 2 (sheep)		23TWS-PN-Hs02	DR CALUX	1,28	1,58	2,86					
		Pine needles - *Picea abies*	Hosťovce - Loc. 2 (sheep)		23TWS-PN-Hs02	PAH CALUX				0,56				
		Pine needles - *Picea abies*	Hosťovce - Loc. 2 (sheep)		23TWS-PN-Hs02	Heavy Metals							14	
							TW Indicative scale Vegetation / (Feed)			TW Indicative scale Results		TW Indicative scale	TW Indicative scale	
							DR CALUX			PAH CALUX	PAH GC-MS/MS	PAH GC-MS/MS	Heavy Metals	
							PCDD/F	dl-PCB	(PCDD/F/dl-PCB)	Benzo(a)pyrene equivalent	∑ 4 PAH	∑ 16 PAH	mos/veg	
							pg TCDD eq./g dry weight (dw)			ng BaP eq./g product	ng/g product	ng/g product		
							≥ 2.5	≥ 2.5	≥ 3.32	> 500 ng	> 500 ng	> 500 ng		
							≥ 1.0	≥ 1.0	≥ 1.66	> 250 ng	> 250 ng	> 250 ng		
							≥ 0.5	≥ 0.5	≥ 0.83	≥ 100 ng	≥ 100 ng	≥ 100 ng		
							< 0.5	< 0.5	< 0.83	≥ 10 ng	≥ 10 ng	≥ 10 ng		
										< 10 ng	< 10 ng	< 10 ng		

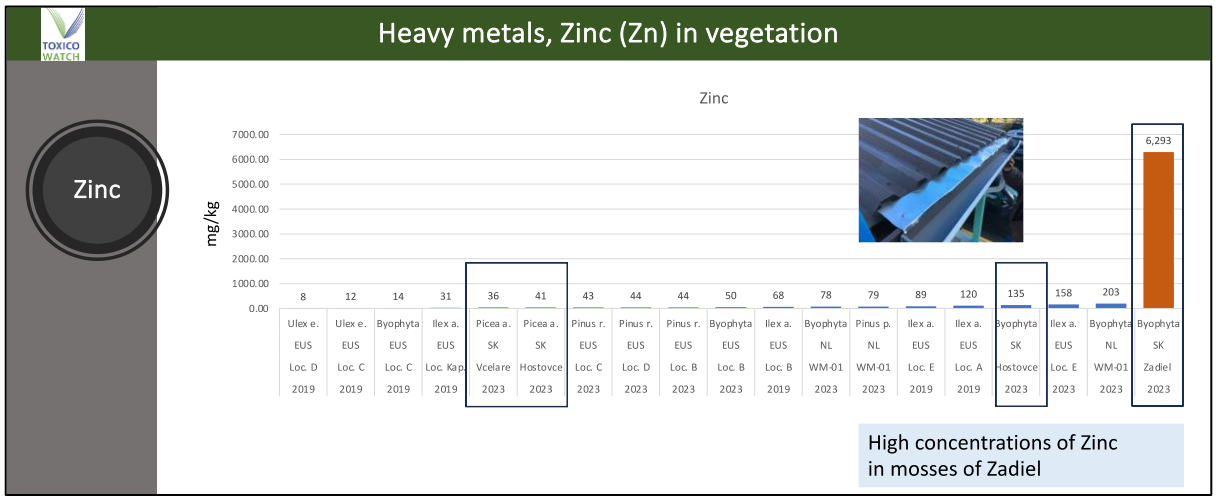
Annexe 7: Results Mosses

The indicative colour bars provided by ToxicoWatch serve as a reference scale. Mosses and pine needles are expressed in 88% dry weight and medium bound (MB).

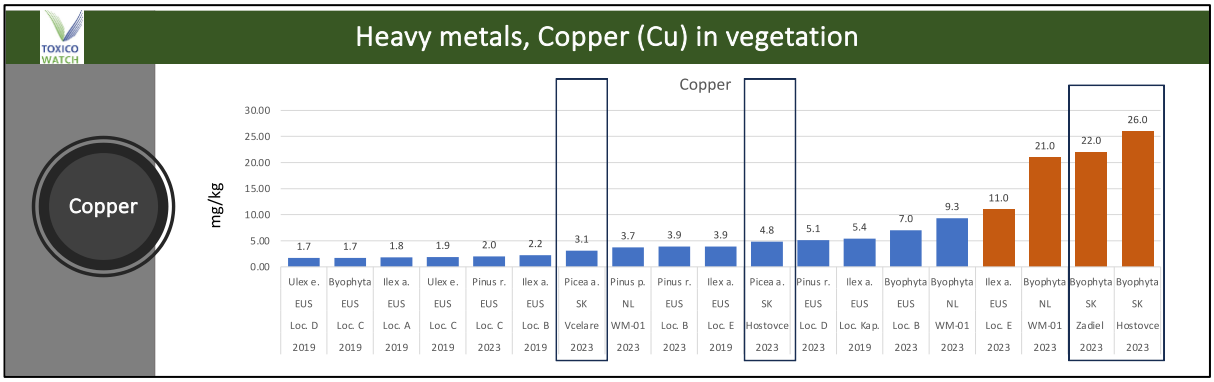
Results (sampling October-November), Košice Region , Slovakia 2023													
							Dioxins DR CALUX (mb)			medium bound (mb)	medium bound (mb)		
Date	Total	Samples	Location Village	Biomarker	TW-RF-NR	Analyse	PCDD/F	dl-PCB	PCDD/F/dl-PCB	PAH	4 PAH	16 PAH	
							DR CALUX	DR CALUX	DR CALUX	PAH CALUX	GC-MS/MS	GC-MS/MS	Heavy Metals
Sample	loc. / BioMat.				2023	Method	1.7		3.3.				14
							pg BEQ (TCDD)/g fat (veg: product)			Benzo(a)pyrene equivalent ng BaP eq./g product	∑ 4 PAH ng / g	∑ 16 PAH ng / g	
		Vegetation / Mosses					FEED / Vegetation /Mosses (Medium bound (mb), 88% Dry Weight/ (dw))						
30-10-2023	1	Mosses Roof	Dvornike - Loc. 1		23TWS-Mos-Dv01	DR CALUX	18,32	5,45	23,76				
		Mosses Roof	Dvornike - Loc. 1		23TWS-Mos-Dv01	PAH CALUX				371,29			
		Mosses Roof	Dvornike - Loc. 1		23TWS-Mos-Dv01	PAH GC-MS/MS					186	516,6	
31-10-2023	2	Mosses ground	Dvornike / Hill		23TWS-Mos-Dv03	DR CALUX	3,08	0,24	3,32				
		Mosses ground	Dvornike / Hill		23TWS-Mos-Dv03	PAH CALUX				355,45			
		Mosses ground	Dvornike / Hill		23TWS-Mos-Dv03	PAH GC-MS/MS					32,6	95,3	
30-10-2023	3	Mosses Roof	Včeláre - Loc. 2		23TWS-Mos-Vc01	DR CALUX	5,05	1,39	6,43				
		Mosses Roof	Včeláre - Loc. 2		23TWS-Mos-Vc01	PAH CALUX				4684,68			
		Mosses Roof	Včeláre - Loc. 2		23TWS-Mos-Vc01	PAH GC-MS/MS					117	313,6	
		Mosses Roof	Včeláre - Loc. 2		23TWS-Mos-Vc01	PAH GC-MS/MS					88,2	232,9	
30-10-2023	4	Mosses Roof	Zádiel - Loc. 1		23TWS-Mos-Za01	Heavy Metals							14
31-10-2023	5	Mosses Roof	Zádiel - Loc. 2		23TWS-Mos-Za02	DR CALUX	10,70	0,09	10,78				
		Mosses Roof	Zádiel - Loc. 2		23TWS-Mos-Za02	PAH CALUX				1016,04			
		Mosses Roof	Zádiel - Loc. 2		23TWS-Mos-Za02	PAH GC-MS/MS					312	885,3	
31-10-2023	6	Mosses Roof	Hosťovce - Loc. 2 (sheep)		23TWS-Mos-Hs02	DR CALUX	14,42	4,57	18,99				
		Mosses Roof	Hosťovce - Loc. 2 (sheep)		23TWS-Mos-Hs02	PAH CALUX				432,69			
		Mosses Roof	Hosťovce - Loc. 2 (sheep)		23TWS-Mos-Hs02	Heavy Metals							14
31-10-2023	7	Mosses Roof	Hosťovce - Loc. 1		23TWS-Mos-Hs01	PAH GC-MS/MS					303	815,3	
		Mosses Roof	Hosťovce - Loc. 1		23TWS-Mos-Hs01	PAH GC-MS/MS					423	1065,9	
							TW Indicative scale Vegetation / (Feed)			TW Indicative scale Results		TW ind. Scale	TW ind. Scale
							DR CALUX			PAH CALUX	PAH GC-MS/MS	PAH GC-MS/MS	Heavy Metals
							PCDD/F	dl-PCB	(PCDD/F/dl-PCB)	Benzo(a)pyrene equivalent	∑ 4 PAH	∑ 16 PAH	
							pg TCDD eq./g dry weight (dw)			ng BaP eq./g product	ng/g product	ng / g	mos/veg
							≥ 2.5	≥ 2.5	≥ 3.32	> 500 ng	> 500 ng	> 500 ng	
							≥ 1.0	≥ 1.0	≥ 1.66	> 250 ng	> 250 ng	> 250 ng	
							≥ 0.5	≥ 0.5	≥ 0.83	≥ 100 ng	≥ 100 ng	≥ 100 ng	
							< 0.5	< 0.5	< 0.83	≥ 10 ng	≥ 10 ng	≥ 10 ng	
										< 10 ng	< 10 ng	< 10 ng	

Annexe 8: Heavy metals

A high amount of Zinc is found in mosses in Zádiel. Maybe this is from zinc-coated (electroplated) gutters or roof-plates. Although Zinc is essential for life, too much Zinc ingestion can result in nausea, vomiting, and diarrhoea.



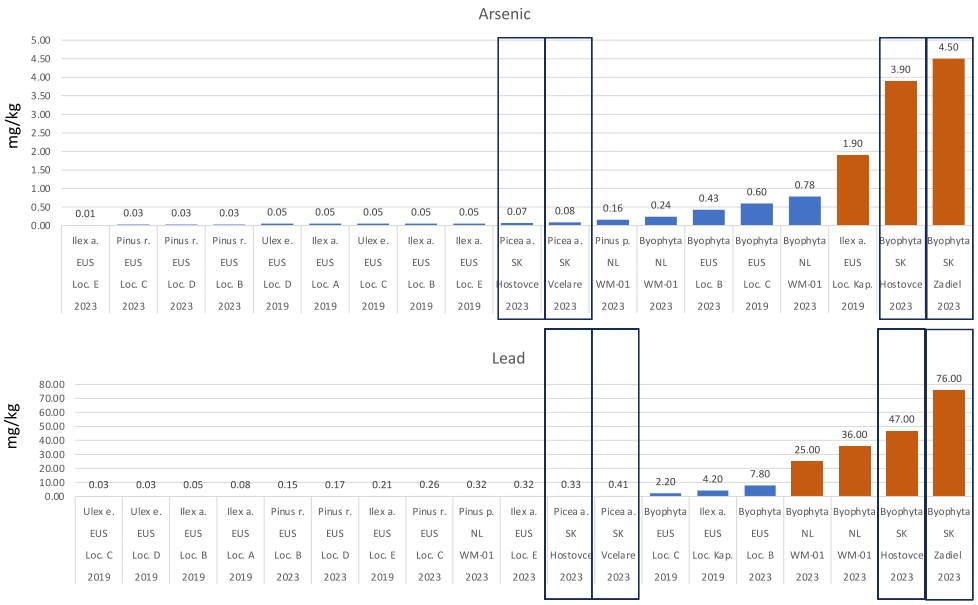
High levels of copper are found in the mosses of Hosťovce and Zádiel, resp. 26 and 22 mg/kg.



Heavy metals, Arsenic (As) and Lead (Pb) in vegetation

Arsenic

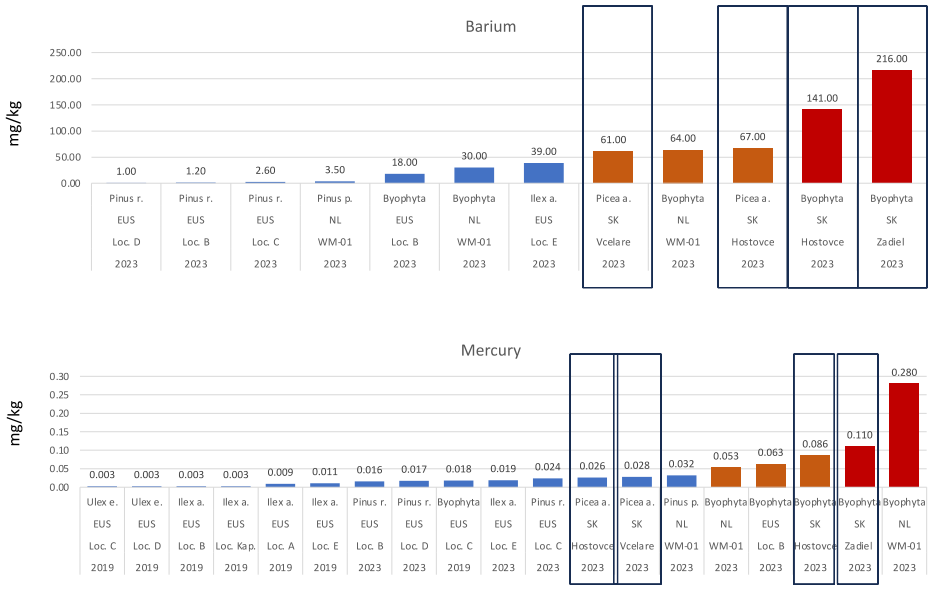
Lead



Heavy metals, Barium (Ba) and Mercury (Hg) in vegetation

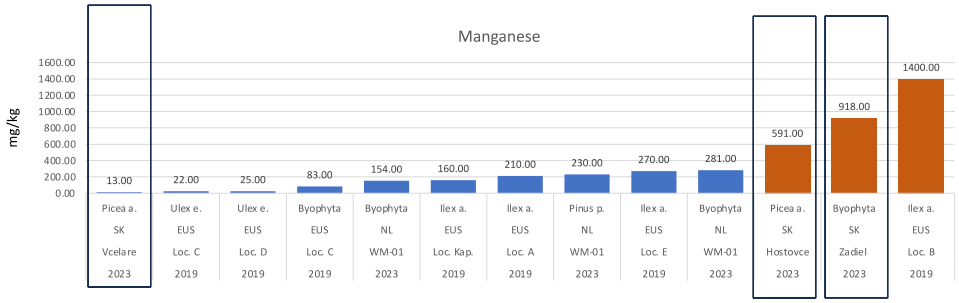
Barium

Mercury

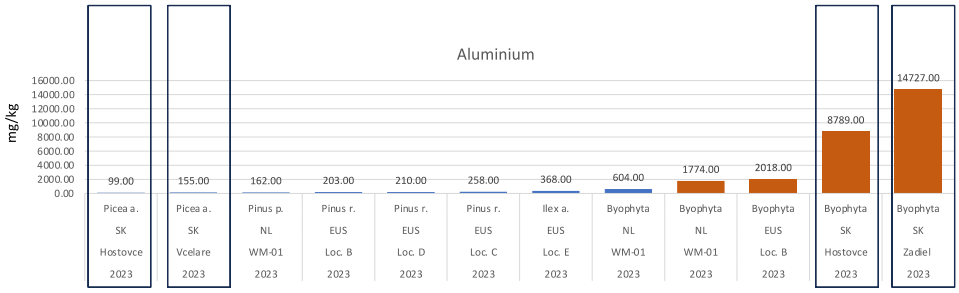


Heavy metals, Manganese (Mn) and Aluminium (Al) in vegetation

Manganese

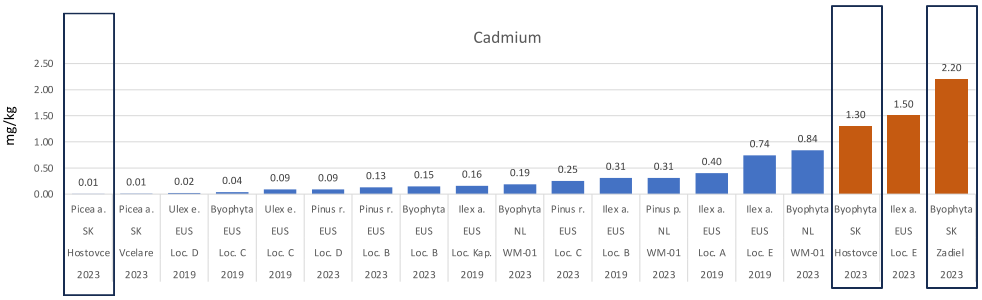


Aluminium

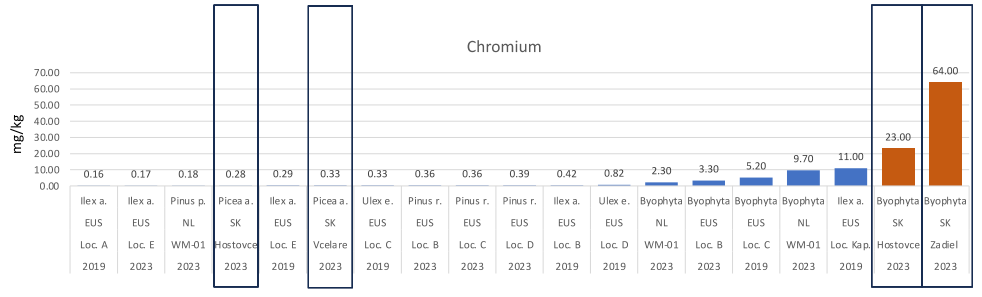


Heavy metals, Cadmium (Cd) and Chromium (Cr) in vegetation

Cadmium

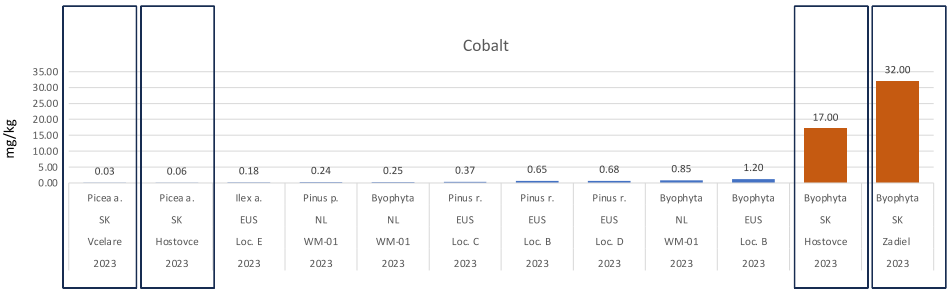


Chromium



Heavy metals, Cobalt (Co) and Nickel (Ni) in vegetation

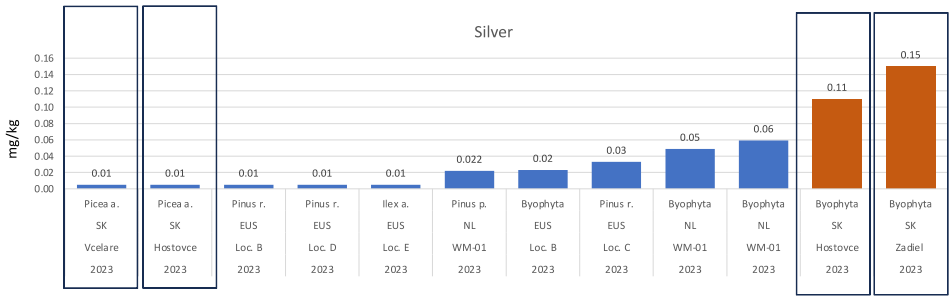
Cobalt



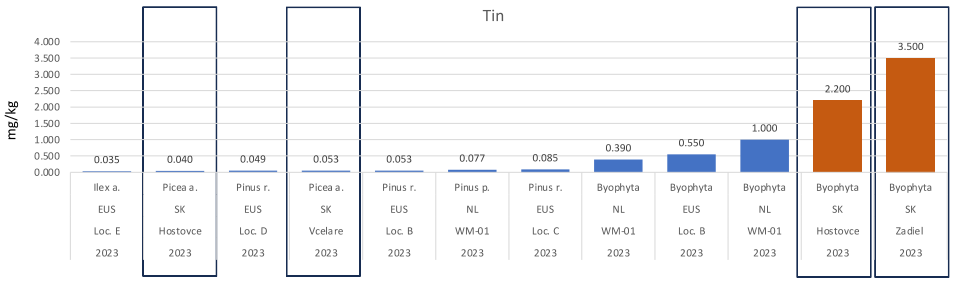
Nickel

Heavy metals, Tin (Sb) and Silver (Ag) in vegetation

Silver



Tin



Biomonitoring research on persistent organic pollutants in the surrounding environment of the Cement plant Turňa nad Bodvou, Slovakia, 2023

Annexe lab results

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Analysis report

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Authorized by:
Emiel Felzel
Head of Testing Laboratory

Date report (dd-mm-yyyy):
08-01-2024

Information about report
The results of examination refer exclusively to the checked samples.
Results are given in table 1.
Sample characteristics are given in table 2.
The measurement uncertainty for CALUX method is typically below 30%. For the calculation a coverage factor of 1 is used.
If an analysis is accredited by ISO17025 (RvA L401) is indicated by a yes or a no
Date of the performance of the test: 04-01-2024

Table 1 sample analysis results

No.	Client code	Method	Parameter	Result	Conclusion	Cut off	Unit
1	23TWS-APU-DV01	DR CALUX	PCDD/PCDF (separated TEQ)	<0.05	---	n.a.	pg TEQ / gram w.w.
2	23TWS-APU-DV01	DR CALUX	dl-PCBs (separated TEQ)	<0.05	---	n.a.	pg TEQ / gram w.w.
3	23TWS-APU-DV01	PAH CALUX	Polycyclic aromatic hydrocarbons	0.67	---	n.a.	ng Benzo[a]pyrene eq./g w.w.
4	23TWS-APU-DV02	DR CALUX	PCDD/PCDF (separated TEQ)	<0.05	---	n.a.	pg TEQ / gram w.w.
5	23TWS-APU-DV02	DR CALUX	dl-PCBs (separated TEQ)	<0.05	---	n.a.	pg TEQ / gram w.w.
6	23TWS-APU-DV02	PAH CALUX	Polycyclic aromatic hydrocarbons	0.40	---	n.a.	ng Benzo[a]pyrene eq./g w.w.
7	23TWS-APU-VC03	DR CALUX	PCDD/PCDF (separated TEQ)	<0.05	---	n.a.	pg TEQ / gram w.w.
8	23TWS-APU-VC03	DR CALUX	dl-PCBs (separated TEQ)	<0.05	---	n.a.	pg TEQ / gram w.w.
9	23TWS-APU-VC03	PAH CALUX	Polycyclic aromatic hydrocarbons	0.32	---	n.a.	ng Benzo[a]pyrene eq./g w.w.
10	23TWS-APU-TNB01	DR CALUX	PCDD/PCDF (separated TEQ)	0.18	---	n.a.	pg TEQ / gram w.w.
11	23TWS-APU-TNB01	DR CALUX	dl-PCBs (separated TEQ)	<0.05	---	n.a.	pg TEQ / gram w.w.
12	23TWS-APU-TNB01	PAH CALUX	Polycyclic aromatic hydrocarbons	2.5	---	n.a.	ng Benzo[a]pyrene eq./g w.w.
13	23TWH-FRAPNC-WH-01-5	DR CALUX	PCDD/PCDF (separated TEQ)	<0.05	---	n.a.	pg TEQ / gram w.w.
14	23TWH-FRAPNC-WH-01-5	DR CALUX	dl-PCBs (separated TEQ)	<0.05	---	n.a.	pg TEQ / gram w.w.
15	23TWH-FRAPNC-WH-01-5	PAH CALUX	Polycyclic aromatic hydrocarbons	1.7	---	n.a.	ng Benzo[a]pyrene eq./g w.w.
16	23TWH-BKNC-WH01	DR CALUX	PCDD/PCDF (separated TEQ)	<0.05	---	n.a.	pg TEQ / gram w.w.
17	23TWH-BKNC-WH01	DR CALUX	dl-PCBs (separated TEQ)	<0.05	---	n.a.	pg TEQ / gram w.w.
18	23TWH-BKNC-WH01	PAH CALUX	Polycyclic aromatic hydrocarbons	3.1	---	n.a.	ng Benzo[a]pyrene eq./g w.w.
19	23TWS-MOS-DV01	DR CALUX	dl-PCBs (separated TEQ)	2.2	---	n.a.	pg TEQ / gram w.w.
20	23TWS-MOS-DV01	DR CALUX	PCDD/PCDF (separated TEQ)	7.4	---	n.a.	pg TEQ / gram w.w.
21	23TWS-MOS-DV01	PAH CALUX	Polycyclic aromatic hydrocarbons	150	---	n.a.	ng Benzo[a]pyrene eq./g w.w.
22	23TWS-MOS-DV03	DR CALUX	dl-PCBs (separated TEQ)	<0.2	---	n.a.	pg TEQ / gram w.w.
23	23TWS-MOS-DV03	DR CALUX	PCDD/PCDF (separated TEQ)	1.3	---	n.a.	pg TEQ / gram w.w.
24	23TWS-MOS-DV03	PAH CALUX	Polycyclic aromatic hydrocarbons	150	---	n.a.	ng Benzo[a]pyrene eq./g w.w.
25	23TWS-MOS-VC01	DR CALUX	dl-PCBs (separated TEQ)	0.77	---	n.a.	pg TEQ / gram w.w.
26	23TWS-MOS-VC01	DR CALUX	PCDD/PCDF (separated TEQ)	2.8	---	n.a.	pg TEQ / gram w.w.
27	23TWS-MOS-VC01	PAH CALUX	Polycyclic aromatic hydrocarbons	2600	---	n.a.	ng Benzo[a]pyrene eq./g w.w.
28	23TWS-MOS-ZA02	DR CALUX	dl-PCBs (separated TEQ)	<0.1	---	n.a.	pg TEQ / gram w.w.
29	23TWS-MOS-ZA02	DR CALUX	PCDD/PCDF (separated TEQ)	6.0	---	n.a.	pg TEQ / gram w.w.
30	23TWS-MOS-ZA02	PAH CALUX	Polycyclic aromatic hydrocarbons	570	---	n.a.	ng Benzo[a]pyrene eq./g w.w.
31	23TWS-MOS-HS02	DR CALUX	dl-PCBs (separated TEQ)	1.9	---	n.a.	pg TEQ / gram w.w.
32	23TWS-MOS-HS02	DR CALUX	PCDD/PCDF (separated TEQ)	6.0	---	n.a.	pg TEQ / gram w.w.
33	23TWS-MOS-HS02	PAH CALUX	Polycyclic aromatic hydrocarbons	180	---	n.a.	ng Benzo[a]pyrene eq./g w.w.
34	23TWS-PN-DV01	DR CALUX	dl-PCBs (separated TEQ)	0.44	---	n.a.	pg TEQ / gram w.w.
35	23TWS-PN-DV01	DR CALUX	PCDD/PCDF (separated TEQ)	0.17	---	n.a.	pg TEQ / gram w.w.
36	23TWS-PN-DV01	PAH CALUX	Polycyclic aromatic hydrocarbons	1.7	---	n.a.	ng Benzo[a]pyrene eq./g w.w.

37	23TWS-PN-VC02	DR CALUX	dl-PCBs (separated TEQ)	0.91	---	n.a.	pg TEQ / gram w.w.
38	23TWS-PN-VC02	DR CALUX	PCDD/PCDF (separated TEQ)	0.75	---	n.a.	pg TEQ / gram w.w.
39	23TWS-PN-VC02	PAH CALUX	Polycyclic aromatic hydrocarbons	0.46	---	n.a.	ng Benzo[a]pyrene eq./g w.w.
40	23TWS-PN-ZA01	DR CALUX	dl-PCBs (separated TEQ)	0.56	---	n.a.	pg TEQ / gram w.w.
41	23TWS-PN-ZA01	DR CALUX	PCDD/PCDF (separated TEQ)	0.37	---	n.a.	pg TEQ / gram w.w.
42	23TWS-PN-ZA01	PAH CALUX	Polycyclic aromatic hydrocarbons	<0.10	---	n.a.	ng Benzo[a]pyrene eq./g w.w.
43	23TWS-PN-HS02	DR CALUX	dl-PCBs (separated TEQ)	0.88	---	n.a.	pg TEQ / gram w.w.
44	23TWS-PN-HS02	DR CALUX	PCDD/PCDF (separated TEQ)	0.71	---	n.a.	pg TEQ / gram w.w.
45	23TWS-PN-HS02	PAH CALUX	Polycyclic aromatic hydrocarbons	0.31	---	n.a.	ng Benzo[a]pyrene eq./g w.w.
46	23TWS-EGG-DV-02	DR CALUX	PCDD/PCDF and dl-PCBs (BEQ; semi)	1.2	compliant	3.3	pg BEQ / gram fat
47	23TWS-EGG-DV-02	DR CALUX	PCDD/PCDF (BEQ; semi)	1.0	compliant	1.7	pg BEQ / gram fat
48	23TWS-EGG-VC-01	DR CALUX	PCDD/PCDF and dl-PCBs (BEQ; semi)	1.7	compliant	3.3	pg BEQ / gram fat
49	23TWS-EGG-VC-01	DR CALUX	PCDD/PCDF (BEQ; semi)	1.6	compliant	1.7	pg BEQ / gram fat
50	23TWS-EGG-ZA-01	DR CALUX	PCDD/PCDF and dl-PCBs (BEQ; semi)	1.7	compliant	3.3	pg BEQ / gram fat
51	23TWS-EGG-ZA-01	DR CALUX	PCDD/PCDF (BEQ; semi)	0.65	compliant	1.7	pg BEQ / gram fat
52	23TWS-RD-DV01	DR CALUX	dl-PCBs (separated TEQ)	1.2	---	n.a.	pg TEQ / gram dry weight
53	23TWS-RD-DV01	DR CALUX	PCDD/PCDF (separated TEQ)	5.1	---	n.a.	pg TEQ / gram dry weight
54	23TWS-RD-DV01	PAH CALUX	Polycyclic aromatic hydrocarbons	45000	---	n.a.	ng Benzo[a]pyrene eq./g dry weight
55	23TWS-RD-ZA-02	DR CALUX	PCDD/PCDF (separated TEQ)	3.3	---	n.a.	pg TEQ / gram dry weight
56	23TWS-RD-ZA-02	DR CALUX	dl-PCBs (separated TEQ)	2.2	---	n.a.	pg TEQ / gram dry weight
57	23TWS-RD-ZA-02	PAH CALUX	Polycyclic aromatic hydrocarbons	34000	---	n.a.	ng Benzo[a]pyrene eq./g dry weight
58	23TWS-H20-CK-01	FITC-T4	Thyroid disruption	21	---	n.a.	ug PFOA eq./l
59	23TWS-SED-CK-01	FITC-T4	Thyroid disruption	1.3	---	n.a.	ug PFOA eq./gram dry sample
60	23TWS-EGG-ZA-02	DR CALUX	PCDD/PCDF and dl-PCBs (BEQ; semi)	9.8	suspected	3.3	pg BEQ / gram fat
61	23TWS-EGG-ZA-02	DR CALUX	PCDD/PCDF (BEQ; semi)	3.1	suspected	1.7	pg BEQ / gram fat
62	23TWS-EGG-TNB-01	DR CALUX	PCDD/PCDF and dl-PCBs (BEQ; semi)	4.8	suspected	3.3	pg BEQ / gram fat
63	23TWS-EGG-TNB-01	DR CALUX	PCDD/PCDF (BEQ; semi)	2.7	suspected	1.7	pg BEQ / gram fat
64	23TWS-EGG-HS-01	DR CALUX	PCDD/PCDF and dl-PCBs (BEQ; semi)	4.7	suspected	3.3	pg BEQ / gram fat
65	23TWS-EGG-HS-01	DR CALUX	PCDD/PCDF (BEQ; semi)	2.2	suspected	1.7	pg BEQ / gram fat

For the suspected sample(s) to be non-compliant, the concentration has to be determined by a confirmatory method

Results given behind the less than sign are the limit of quantification.

n.a.= no cut off according to EU guideline in BEQ established, maximal levels applicable if available

Table 2 sample characteristics

No.	Client code	BDS code	Matrix	ISO17025 (RvAL401)	Date arrival	Sealed
1	23TWS-APU-DV01	47320	Not defined	no	28-11-2023	
2	23TWS-APU-DV01	47320	Not defined	no	28-11-2023	
3	23TWS-APU-DV01	47320	Not defined	no	28-11-2023	
4	23TWS-APU-DV02	47321	Not defined	no	28-11-2023	
5	23TWS-APU-DV02	47321	Not defined	no	28-11-2023	
6	23TWS-APU-DV02	47321	Not defined	no	28-11-2023	
7	23TWS-APU-VC03	47322	Not defined	no	28-11-2023	
8	23TWS-APU-VC03	47322	Not defined	no	28-11-2023	
9	23TWS-APU-VC03	47322	Not defined	no	28-11-2023	
10	23TWS-APU-TNB01	47323	Not defined	no	28-11-2023	
11	23TWS-APU-TNB01	47323	Not defined	no	28-11-2023	
12	23TWS-APU-TNB01	47323	Not defined	no	28-11-2023	
13	23TWH-FRAPNC-WH-01-5	47324	Not defined	no	28-11-2023	
14	23TWH-FRAPNC-WH-01-5	47324	Not defined	no	28-11-2023	
15	23TWH-FRAPNC-WH-01-5	47324	Not defined	no	28-11-2023	
16	23TWH-BKNC-WH01	47325	Not defined	no	28-11-2023	
17	23TWH-BKNC-WH01	47325	Not defined	no	28-11-2023	
18	23TWH-BKNC-WH01	47325	Not defined	no	28-11-2023	
19	23TWS-MOS-DV01	47326	Not defined	no	28-11-2023	
20	23TWS-MOS-DV01	47326	Not defined	no	28-11-2023	
21	23TWS-MOS-DV01	47326	Not defined	no	28-11-2023	
22	23TWS-MOS-DV03	47327	Not defined	no	28-11-2023	
23	23TWS-MOS-DV03	47327	Not defined	no	28-11-2023	
24	23TWS-MOS-DV03	47327	Not defined	no	28-11-2023	
25	23TWS-MOS-VC01	47328	Not defined	no	28-11-2023	
26	23TWS-MOS-VC01	47328	Not defined	no	28-11-2023	
27	23TWS-MOS-VC01	47328	Not defined	no	28-11-2023	
28	23TWS-MOS-ZA02	47329	Not defined	no	28-11-2023	
29	23TWS-MOS-ZA02	47329	Not defined	no	28-11-2023	
30	23TWS-MOS-ZA02	47329	Not defined	no	28-11-2023	
31	23TWS-MOS-HS02	47330	Not defined	no	28-11-2023	

32	23TWS-MOS-HS02	47330	Not defined	no	28-11-2023	
33	23TWS-MOS-HS02	47330	Not defined	no	28-11-2023	
34	23TWS-PN-DV01	47331	Not defined	no	28-11-2023	
35	23TWS-PN-DV01	47331	Not defined	no	28-11-2023	
36	23TWS-PN-DV01	47331	Not defined	no	28-11-2023	
37	23TWS-PN-VC02	47332	Not defined	no	28-11-2023	
38	23TWS-PN-VC02	47332	Not defined	no	28-11-2023	
39	23TWS-PN-VC02	47332	Not defined	no	28-11-2023	
40	23TWS-PN-ZA01	47333	Not defined	no	28-11-2023	
41	23TWS-PN-ZA01	47333	Not defined	no	28-11-2023	
42	23TWS-PN-ZA01	47333	Not defined	no	28-11-2023	
43	23TWS-PN-HS02	47334	Not defined	no	28-11-2023	
44	23TWS-PN-HS02	47334	Not defined	no	28-11-2023	
45	23TWS-PN-HS02	47334	Not defined	no	28-11-2023	
46	23TWS-EGG-DV-02	47335	Food, egg(product)	yes	28-11-2023	
47	23TWS-EGG-DV-02	47335	Food, egg(product)	yes	28-11-2023	
48	23TWS-EGG-VC-01	47336	Food, egg(product)	yes	28-11-2023	
49	23TWS-EGG-VC-01	47336	Food, egg(product)	yes	28-11-2023	
50	23TWS-EGG-ZA-01	47337	Food, egg(product)	yes	28-11-2023	
51	23TWS-EGG-ZA-01	47337	Food, egg(product)	yes	28-11-2023	
52	23TWS-RD-DV01	47341	Dust	no	28-11-2023	
53	23TWS-RD-DV01	47341	Dust	no	28-11-2023	
54	23TWS-RD-DV01	47341	Dust	no	28-11-2023	
55	23TWS-RD-ZA-02	47342	Dust	no	28-11-2023	
56	23TWS-RD-ZA-02	47342	Dust	no	28-11-2023	
57	23TWS-RD-ZA-02	47342	Dust	no	28-11-2023	
58	23TWS-H20-CK-01	47343	Water	no	28-11-2023	
59	23TWS-SED-CK-01	47344	Sediment	no	28-11-2023	
60	23TWS-EGG-ZA-02	47562	Food, egg(product)	yes	28-11-2023	no
61	23TWS-EGG-ZA-02	47562	Food, egg(product)	yes	28-11-2023	no
62	23TWS-EGG-TNB-01	47563	Food, egg(product)	yes	28-11-2023	no
63	23TWS-EGG-TNB-01	47563	Food, egg(product)	yes	28-11-2023	no
64	23TWS-EGG-HS-01	47564	Food, egg(product)	yes	28-11-2023	no
65	23TWS-EGG-HS-01	47564	Food, egg(product)	yes	28-11-2023	no

For the method DR CALUX and the sum parameter PCDD/PCDF (separated TEQ) the used method is extraction with organic solvents; the extracts are cleaned on an acid silica column and separation is done with a florisil column. The cleaned extracts are dissolved in DMSO. The DR CALUX activity is determined (24h exposure) and benchmarked against 2,3,7,8-TCDD. The DR CALUX analysis is done according to p-bds-051

For the method DR CALUX and the sum parameter dl-PCBs (separated TEQ) the used method is extraction with organic solvents; the extracts are cleaned on an acid silica column and separation is done with a florisil column. The cleaned extracts are dissolved in DMSO. The DR CALUX activity is determined (24h exposure) and benchmarked against 2,3,7,8-TCDD. The DR CALUX analysis is done according to p-bds-051.

For the method PAH CALUX and the sum parameter Polycyclic aromatic hydrocarbons the used method is Extracts are dissolved in DMSO. The PAH CALUX activity is determined (4h exposure) and benchmarked against Benzo[a]pyrene.

For the method DR CALUX and the sum parameter PCDD/PCDF (BEQ; semi) the used method is shake extraction with organic solvents (hexane); the extracts are cleaned on an acid silica column. The cleaned extracts are dissolved in DMSO. The DR CALUX activity is determined (24h exposure). The response of the sample is corrected for the background and subsequently corrected for the apparent bioassay recovery with a reference sample at the level of interest. The evaluation was done on the maximum level for PCDD/F, from which a cut off value has been established (2/3 of maximum level) to determine if a sample is compliant or suspected. As a maximum level the level of the matrix as described in the table above is used. After the evaluation an estimation is given of the sample in the form of a BEQ outcome. The DR CALUX analysis is done according to p-bds-051.

For the method DR CALUX and the sum parameter PCDD/PCDF and dl-PCBs (BEQ; semi) the used method is shake extraction with organic solvents (hexane); the extracts are cleaned on an acid silica column. The cleaned extracts are dissolved in DMSO. The DR CALUX activity is determined (24h exposure). The response of the sample is corrected for the background and subsequently corrected for the apparent bioassay recovery with a reference sample at the level of interest. The evaluation was done on the maximum level for PCDD/F and dl-PCBs, from which a cut off value has been established (2/3 of maximum level) to determine if a sample is compliant or suspected. As a maximum level the level of the matrix as described in the table above is used. After the evaluation an estimation is given of the sample in the form of a BEQ outcome. The DR CALUX analysis is done according to p-bds-051.

All DR CALUX analysis results comply with EU requirements as indicated in Commission Regulation (EU) 2017/644 of 5 April 2017 laying down methods of sampling and analysis for the control of levels of dioxins, dioxin-like PCBs and non-dioxin-like PCBs in certain foodstuffs. Maximal levels according to Commission Regulation (EC) No 1881/2006.

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Analysis report

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Authorized by:
Emiel Felzel
Head of Testing Laboratory

Date report (dd-mm-yyyy):
08-01-2024

Information about report
The results of examination refer exclusively to the checked samples.
All analysis results comply with EU requirements as indicated in Commission Regulation (EU) 2017/644 of 5 April 2017 laying down methods of sampling and analysis for the control of levels of dioxins, dioxin-like PCBs and non-dioxin-like PCBs in certain foodstuffs. Maximal levels according to Commission Regulation (EC) No 1881/2006.
For the analyses on dioxins/furans/dl-PCBs/ndl-PCB the sample is extracted with organic solvents (hexane); the extracts are cleaned on an acid silica column/alumina/florisil/carbon. For recovery calculation all 13C labeled congeners are added. The concentrations are determined by GC-MS/MS.

Information about sample

BDS sample number	47338
Client identification	23TWS-EGG-ZA-02
Sample recieved on	28-11-2023
Start of test	30-11-2023
End of test	11-12-2023
Matrix	Food, egg(product)

Judgement

Non-compliant for maximal level limit (expressed as WHO PCDD/F + dl-PCBs TEQ) taking into account expanded measurement uncertainity.
Sample 23TWS-EGG-ZA-02 is above the maximal level of 5.0 pg TEQ / gram fat.

Test results:

WHO sum parameters (accredited under RvA L401)

WHO PCDD/F TEQ lowerbound 2005	2	pg TEQ / gram fat	U+/-	24%
WHO PCDD/F TEQ mediumbound 2005	2.2	pg TEQ / gram fat	U+/-	24%
WHO PCDD/F TEQ upperbound 2005	2.3	pg TEQ / gram fat	U+/-	24%
WHO dl-PCBs TEQ lowerbound 2005	6.6	pg TEQ / gram fat	U+/-	24%
WHO dl-PCBs TEQ mediumbound 2005	6.6	pg TEQ / gram fat	U+/-	24%
WHO dl-PCBs TEQ upperbound 2005	6.6	pg TEQ / gram fat	U+/-	24%
WHO PCDD/F/dl-PCBs TEQ lowerbound 2005	8.7	pg TEQ / gram fat	U+/-	23%
WHO PCDD/F/dl-PCBs TEQ mediumbound 2005	8.8	pg TEQ / gram fat	U+/-	23%
WHO PCDD/F/dl-PCBs TEQ upperbound 2005	8.9	pg TEQ / gram fat	U+/-	23%

Dioxins/furans (accredited under RvA L401)

2,3,7,8-Tetrachlorodibenzo-p-dioxin	<0.2	pg / gram fat	U+/-	44%
1,2,3,7,8-Pentachlorodibenzo-p-dioxin	0.27	pg / gram fat	U+/-	31%
1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin	0.44	pg / gram fat	U+/-	44%
1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin	0.54	pg / gram fat	U+/-	46%
1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin	0.19	pg / gram fat	U+/-	41%
1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin	1.1	pg / gram fat	U+/-	34%
Octachlorodibenzo-p-dioxin	2.8	pg / gram fat	U+/-	49%
2,3,7,8-Tetrachlorodibenzofuran	2.6	pg / gram fat	U+/-	27%
1,2,3,7,8-Pentachlorodibenzofuran	2.0	pg / gram fat	U+/-	31%
2,3,4,7,8-Pentachlorodibenzofuran	3.1	pg / gram fat	U+/-	29%
1,2,3,4,7,8-Hexachlorodibenzofuran	2.3	pg / gram fat	U+/-	37%
1,2,3,6,7,8-Hexachlorodibenzofuran	0.81	pg / gram fat	U+/-	25%

1,2,3,7,8,9-Hexachlorodibenzofuran	<0.2	pg / gram fat	U+/-	41%
2,3,4,6,7,8-Hexachlorodibenzofuran	0.84	pg / gram fat	U+/-	32%
1,2,3,4,6,7,8-Heptachlorodibenzofuran	0.78	pg / gram fat	U+/-	25%
1,2,3,4,7,8,9-Heptachlorodibenzofuran	<0.2	pg / gram fat	U+/-	28%
Octachlorodibenzofuran	<0.2	pg / gram fat	U+/-	37%

dl-PCBs (accredited under RvA L401)

3,3',4,4'-Tetrachlorobiphenyl (#77)	38	pg / gram fat	U+/-	39%
3,4,4',5-Tetrachlorobiphenyl (#81)	4.5	pg / gram fat	U+/-	32%
3,3',4,4',5-Pentachlorobiphenyl (#126)	57	pg / gram fat	U+/-	26%
3,3',4,4',5,5'-Hexachlorobiphenyl (#169)	5.6	pg / gram fat	U+/-	53%
2,3,3',4,4'-Pentachlorobiphenyl (#105)	2300	pg / gram fat	U+/-	51%
2,3,4,4',5-Pentachlorobiphenyl (#114)	70	pg / gram fat	U+/-	32%
2,3',4,4',5-Pentachlorobiphenyl (#118)	12000	pg / gram fat	U+/-	44%
2,3',4,4',5'-Pentachlorobiphenyl (#123)	210	pg / gram fat	U+/-	36%
2,3,3',4,4',5-Hexachlorobiphenyl (#156)	5100	pg / gram fat	U+/-	36%
2,3,3',4,4',5'-Hexachlorobiphenyl (#157)	640	pg / gram fat	U+/-	37%
2,3',4,4',5,5'-Hexachlorobiphenyl (#167)	2300	pg / gram fat	U+/-	35%
2,3,3',4,4',5,5'-Heptachlorobiphenyl (#189)	780	pg / gram fat	U+/-	37%

Results given behind the less than sign are the limit of quantification.

Recovery Dioxins/furans

2,3,7,8-Tetrachlorodibenzo-p-dioxin	85.2%
1,2,3,7,8-Pentachlorodibenzo-p-dioxin	93.4%
1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin	97%
1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin	91.8%
1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin	79.8%
1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin	96.1%
Octachlorodibenzo-p-dioxin	129.8%
2,3,7,8-Tetrachlorodibenzofuran	88.5%
1,2,3,7,8-Pentachlorodibenzofuran	71.2%
2,3,4,7,8-Pentachlorodibenzofuran	67%
1,2,3,4,7,8-Hexachlorodibenzofuran	78.7%
1,2,3,6,7,8-Hexachlorodibenzofuran	82%
1,2,3,7,8,9-Hexachlorodibenzofuran	157.7%
2,3,4,6,7,8-Hexachlorodibenzofuran	66.3%
1,2,3,4,6,7,8-Heptachlorodibenzofuran	97.8%
1,2,3,4,7,8,9-Heptachlorodibenzofuran	93.2%
Octachlorodibenzofuran	105.3%

Recovery dl-PCBs

3,3',4,4'-Tetrachlorobiphenyl (#77)	76.7%
3,4,4',5-Tetrachlorobiphenyl (#81)	83.2%
3,3',4,4',5-Pentachlorobiphenyl (#126)	83.4%
3,3',4,4',5,5'-Hexachlorobiphenyl (#169)	151.8%
2,3,3',4,4'-Pentachlorobiphenyl (#105)	78.2%
2,3,4,4',5-Pentachlorobiphenyl (#114)	82.2%
2,3',4,4',5-Pentachlorobiphenyl (#118)	74.4%
2,3',4,4',5'-Pentachlorobiphenyl (#123)	80%
2,3,3',4,4',5-Hexachlorobiphenyl (#156)	98%
2,3,3',4,4',5'-Hexachlorobiphenyl (#157)	88.9%
2,3',4,4',5,5'-Hexachlorobiphenyl (#167)	77.3%
2,3,3',4,4',5,5'-Heptachlorobiphenyl (#189)	108.6%

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Analysis report

Client:
Toxicowatch
Abel Arkenbout
info@toxicowatch.org

8861 CP
Harlingen
Nederland

Authorized by:
Emiel Felzel
Head of Testing Laboratory

Date report (dd-mm-yyyy):
08-01-2024

Information about report

The results of examination refer exclusively to the checked samples.
All analysis results comply with EU requirements as indicated in Commission Regulation (EU) 2017/644 of 5 April 2017 laying down methods of sampling and analysis for the control of levels of dioxins, dioxin-like PCBs and non-dioxin-like PCBs in certain foodstuffs. Maximal levels according to Commission Regulation (EC) No 1881/2006.
For the analyses on dioxins/furans/dl-PCBs/ndl-PCB the sample is extracted with organic solvents (hexane); the extracts are cleaned on an acid silica column/alumina/florisil/carbon. For recovery calculation all 13C labeled congeners are added. The concentrations are determined by GC-MS/MS.

Information about sample

BDS sample number	47339
Client identification	23TWS-EGG-TNB-01
Sample recieved on	28-11-2023
Start of test	30-11-2023
End of test	12-12-2023
Matrix	Food, egg(product)

Test results:

WHO sum parameters (accredited under RvA L401)

WHO PCDD/F TEQ lowerbound 2005	1.2	pg TEQ / gram fat	U+/-	24%
WHO PCDD/F TEQ mediumbound 2005	1.3	pg TEQ / gram fat	U+/-	24%
WHO PCDD/F TEQ upperbound 2005	1.5	pg TEQ / gram fat	U+/-	24%
WHO dl-PCBs TEQ lowerbound 2005	1.1	pg TEQ / gram fat	U+/-	24%
WHO dl-PCBs TEQ mediumbound 2005	1.1	pg TEQ / gram fat	U+/-	24%
WHO dl-PCBs TEQ upperbound 2005	1.1	pg TEQ / gram fat	U+/-	24%
WHO PCDD/F/dl-PCBs TEQ lowerbound 2005	2.4	pg TEQ / gram fat	U+/-	23%
WHO PCDD/F/dl-PCBs TEQ mediumbound 2005	2.5	pg TEQ / gram fat	U+/-	23%
WHO PCDD/F/dl-PCBs TEQ upperbound 2005	2.6	pg TEQ / gram fat	U+/-	23%

Dioxins/furans (accredited under RvA L401)

2,3,7,8-Tetrachlorodibenzo-p-dioxin	<0.2	pg / gram fat	U+/-	44%
1,2,3,7,8-Pentachlorodibenzo-p-dioxin	0.43	pg / gram fat	U+/-	31%
1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin	0.21	pg / gram fat	U+/-	44%
1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin	0.66	pg / gram fat	U+/-	46%
1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin	<0.2	pg / gram fat	U+/-	41%
1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin	1.3	pg / gram fat	U+/-	34%
Octachlorodibenzo-p-dioxin	5.0	pg / gram fat	U+/-	49%
2,3,7,8-Tetrachlorodibenzofuran	1.3	pg / gram fat	U+/-	27%
1,2,3,7,8-Pentachlorodibenzofuran	1.3	pg / gram fat	U+/-	31%
2,3,4,7,8-Pentachlorodibenzofuran	1.0	pg / gram fat	U+/-	29%
1,2,3,4,7,8-Hexachlorodibenzofuran	0.84	pg / gram fat	U+/-	37%
1,2,3,6,7,8-Hexachlorodibenzofuran	0.50	pg / gram fat	U+/-	25%
1,2,3,7,8,9-Hexachlorodibenzofuran	<0.2	pg / gram fat	U+/-	41%
2,3,4,6,7,8-Hexachlorodibenzofuran	0.64	pg / gram fat	U+/-	32%
1,2,3,4,6,7,8-Heptachlorodibenzofuran	1.4	pg / gram fat	U+/-	25%
1,2,3,4,7,8,9-Heptachlorodibenzofuran	<0.2	pg / gram fat	U+/-	28%

Octachlorodibenzofuran	0.43	pg / gram fat	U+/-	37%

dl-PCBs (accredited under RvA L401)

3,3',4,4'-Tetrachlorobiphenyl (#77)	18	pg / gram fat	U+/-	39%
3,4,4',5-Tetrachlorobiphenyl (#81)	2.4	pg / gram fat	U+/-	32%
3,3',4,4',5-Pentachlorobiphenyl (#126)	10	pg / gram fat	U+/-	26%
3,3',4,4',5,5'-Hexachlorobiphenyl (#169)	2.2	pg / gram fat	U+/-	53%
2,3,3',4,4'-Pentachlorobiphenyl (#105)	110	pg / gram fat	U+/-	51%
2,3,4,4',5-Pentachlorobiphenyl (#114)	<9	pg / gram fat	U+/-	32%
2,3',4,4',5-Pentachlorobiphenyl (#118)	300	pg / gram fat	U+/-	44%
2,3',4,4',5'-Pentachlorobiphenyl (#123)	<9	pg / gram fat	U+/-	36%
2,3,3',4,4',5-Hexachlorobiphenyl (#156)	130	pg / gram fat	U+/-	36%
2,3,3',4,4',5'-Hexachlorobiphenyl (#157)	16	pg / gram fat	U+/-	37%
2,3',4,4',5,5'-Hexachlorobiphenyl (#167)	71	pg / gram fat	U+/-	35%
2,3,3',4,4',5,5'-Heptachlorobiphenyl (#189)	35	pg / gram fat	U+/-	37%

Results given behind the less than sign are the limit of quantification.

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Analysis report

Client:
Toxicowatch
Abel Arkenbout
info@toxicowatch.org

8861 CP
Harlingen
Nederland

Authorized by:
Emiel Felzel
Head of Testing Laboratory

Date report (dd-mm-yyyy):
08-01-2024

Information about report

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For the analyses on dioxins/furans/dl-PCBs/ndl-PCB the sample is extracted with organic solvents (hexane); the extracts are cleaned on an acid silica column/alumina/florisil/carbon. For recovery calculation all 13C labeled congeners are added. The concentrations are determined by GC-MS/MS.

Information about sample

BDS sample number	47339
Client identification	23TWS-EGG-TNB-01
Sample recieved on	28-11-2023
Start of test	30-11-2023
End of test	12-12-2023
Matrix	Food, egg(product)

Test results:

WHO sum parameters (accredited under RvA L401)

WHO PCDD/F TEQ lowerbound 2005	1.2	pg TEQ / gram fat	U+/-	24%
WHO PCDD/F TEQ mediumbound 2005	1.3	pg TEQ / gram fat	U+/-	24%
WHO PCDD/F TEQ upperbound 2005	1.5	pg TEQ / gram fat	U+/-	24%
WHO dl-PCBs TEQ lowerbound 2005	1.1	pg TEQ / gram fat	U+/-	24%
WHO dl-PCBs TEQ mediumbound 2005	1.1	pg TEQ / gram fat	U+/-	24%
WHO dl-PCBs TEQ upperbound 2005	1.1	pg TEQ / gram fat	U+/-	24%
WHO PCDD/F/dl-PCBs TEQ lowerbound 2005	2.4	pg TEQ / gram fat	U+/-	23%
WHO PCDD/F/dl-PCBs TEQ mediumbound 2005	2.5	pg TEQ / gram fat	U+/-	23%
WHO PCDD/F/dl-PCBs TEQ upperbound 2005	2.6	pg TEQ / gram fat	U+/-	23%

Dioxins/furans (accredited under RvA L401)

2,3,7,8-Tetrachlorodibenzo-p-dioxin	<0.2	pg / gram fat	U+/-	44%
1,2,3,7,8-Pentachlorodibenzo-p-dioxin	0.43	pg / gram fat	U+/-	31%
1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin	0.21	pg / gram fat	U+/-	44%
1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin	0.66	pg / gram fat	U+/-	46%
1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin	<0.2	pg / gram fat	U+/-	41%
1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin	1.3	pg / gram fat	U+/-	34%
Octachlorodibenzo-p-dioxin	5.0	pg / gram fat	U+/-	49%
2,3,7,8-Tetrachlorodibenzofuran	1.3	pg / gram fat	U+/-	27%
1,2,3,7,8-Pentachlorodibenzofuran	1.3	pg / gram fat	U+/-	31%
2,3,4,7,8-Pentachlorodibenzofuran	1.0	pg / gram fat	U+/-	29%
1,2,3,4,7,8-Hexachlorodibenzofuran	0.84	pg / gram fat	U+/-	37%
1,2,3,6,7,8-Hexachlorodibenzofuran	0.50	pg / gram fat	U+/-	25%
1,2,3,7,8,9-Hexachlorodibenzofuran	<0.2	pg / gram fat	U+/-	41%
2,3,4,6,7,8-Hexachlorodibenzofuran	0.64	pg / gram fat	U+/-	32%
1,2,3,4,6,7,8-Heptachlorodibenzofuran	1.4	pg / gram fat	U+/-	25%
1,2,3,4,7,8,9-Heptachlorodibenzofuran	<0.2	pg / gram fat	U+/-	28%

Octachlorodibenzofuran	0.43	pg / gram fat	U+/-	37%

dl-PCBs (accredited under RvA L401)

3,3',4,4'-Tetrachlorobiphenyl (#77)	18	pg / gram fat	U+/-	39%
3,4,4',5-Tetrachlorobiphenyl (#81)	2.4	pg / gram fat	U+/-	32%
3,3',4,4',5-Pentachlorobiphenyl (#126)	10	pg / gram fat	U+/-	26%
3,3',4,4',5,5'-Hexachlorobiphenyl (#169)	2.2	pg / gram fat	U+/-	53%
2,3,3',4,4'-Pentachlorobiphenyl (#105)	110	pg / gram fat	U+/-	51%
2,3,4,4',5-Pentachlorobiphenyl (#114)	<9	pg / gram fat	U+/-	32%
2,3',4,4',5-Pentachlorobiphenyl (#118)	300	pg / gram fat	U+/-	44%
2,3',4,4',5'-Pentachlorobiphenyl (#123)	<9	pg / gram fat	U+/-	36%
2,3,3',4,4',5-Hexachlorobiphenyl (#156)	130	pg / gram fat	U+/-	36%
2,3,3',4,4',5'-Hexachlorobiphenyl (#157)	16	pg / gram fat	U+/-	37%
2,3',4,4',5,5'-Hexachlorobiphenyl (#167)	71	pg / gram fat	U+/-	35%
2,3,3',4,4',5,5'-Heptachlorobiphenyl (#189)	35	pg / gram fat	U+/-	37%

Results given behind the less than sign are the limit of quantification.

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Analysis report

Client:
Toxicowatch
Abel Arkenbout
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8861 CP
Harlingen
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Authorized by:
Emiel Felzel
Head of Testing Laboratory

Date report (dd-mm-yyyy):
08-01-2024

Information about report

The results of examination refer exclusively to the checked samples.
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For the analyses on dioxins/furans/dl-PCBs/ndl-PCB the sample is extracted with organic solvents (hexane); the extracts are cleaned on an acid silica column/alumina/florisil/carbon. For recovery calculation all 13C labeled congeners are added. The concentrations are determined by GC-MS/MS.

Information about sample

BDS sample number	47340
Client identification	23TWS-EGG-HS-01
Sample recieved on	28-11-2023
Start of test	30-11-2023
End of test	12-12-2023
Matrix	Food, egg(product)

Test results:

WHO sum parameters (accredited under RvA L401)

WHO PCDD/F TEQ lowerbound 2005	0.95	pg TEQ / gram fat	U+/-	24%
WHO PCDD/F TEQ mediumbound 2005	1.1	pg TEQ / gram fat	U+/-	24%
WHO PCDD/F TEQ upperbound 2005	1.2	pg TEQ / gram fat	U+/-	24%
WHO dl-PCBs TEQ lowerbound 2005	3.9	pg TEQ / gram fat	U+/-	24%
WHO dl-PCBs TEQ mediumbound 2005	3.9	pg TEQ / gram fat	U+/-	24%
WHO dl-PCBs TEQ upperbound 2005	3.9	pg TEQ / gram fat	U+/-	24%
WHO PCDD/F/dl-PCBs TEQ lowerbound 2005	4.8	pg TEQ / gram fat	U+/-	23%
WHO PCDD/F/dl-PCBs TEQ mediumbound 2005	4.9	pg TEQ / gram fat	U+/-	23%
WHO PCDD/F/dl-PCBs TEQ upperbound 2005	5.1	pg TEQ / gram fat	U+/-	23%

Dioxins/furans (accredited under RvA L401)

2,3,7,8-Tetrachlorodibenzo-p-dioxin	<0.2	pg / gram fat	U+/-	44%
1,2,3,7,8-Pentachlorodibenzo-p-dioxin	0.18	pg / gram fat	U+/-	31%
1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin	<0.2	pg / gram fat	U+/-	44%
1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin	0.41	pg / gram fat	U+/-	46%
1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin	<0.2	pg / gram fat	U+/-	41%
1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin	0.74	pg / gram fat	U+/-	34%
Octachlorodibenzo-p-dioxin	2.8	pg / gram fat	U+/-	49%
2,3,7,8-Tetrachlorodibenzofuran	1.5	pg / gram fat	U+/-	27%
1,2,3,7,8-Pentachlorodibenzofuran	1.1	pg / gram fat	U+/-	31%
2,3,4,7,8-Pentachlorodibenzofuran	1.3	pg / gram fat	U+/-	29%
1,2,3,4,7,8-Hexachlorodibenzofuran	0.58	pg / gram fat	U+/-	37%
1,2,3,6,7,8-Hexachlorodibenzofuran	0.58	pg / gram fat	U+/-	25%
1,2,3,7,8,9-Hexachlorodibenzofuran	<0.2	pg / gram fat	U+/-	41%
2,3,4,6,7,8-Hexachlorodibenzofuran	0.36	pg / gram fat	U+/-	32%
1,2,3,4,6,7,8-Heptachlorodibenzofuran	0.47	pg / gram fat	U+/-	25%
1,2,3,4,7,8,9-Heptachlorodibenzofuran	<0.2	pg / gram fat	U+/-	28%

Octachlorodibenzofuran	0.52	pg / gram fat	U+/-	37%

dl-PCBs (accredited under RvA L401)

3,3',4,4'-Tetrachlorobiphenyl (#77)	22	pg / gram fat	U+/-	39%
3,4,4',5-Tetrachlorobiphenyl (#81)	<2	pg / gram fat	U+/-	32%
3,3',4,4',5-Pentachlorobiphenyl (#126)	36	pg / gram fat	U+/-	26%
3,3',4,4',5,5'-Hexachlorobiphenyl (#169)	4.7	pg / gram fat	U+/-	53%
2,3,3',4,4'-Pentachlorobiphenyl (#105)	270	pg / gram fat	U+/-	51%
2,3,4,4',5-Pentachlorobiphenyl (#114)	9.1	pg / gram fat	U+/-	32%
2,3',4,4',5-Pentachlorobiphenyl (#118)	1500	pg / gram fat	U+/-	44%
2,3',4,4',5'-Pentachlorobiphenyl (#123)	24	pg / gram fat	U+/-	36%
2,3,3',4,4',5-Hexachlorobiphenyl (#156)	1300	pg / gram fat	U+/-	36%
2,3,3',4,4',5'-Hexachlorobiphenyl (#157)	110	pg / gram fat	U+/-	37%
2,3',4,4',5,5'-Hexachlorobiphenyl (#167)	750	pg / gram fat	U+/-	35%
2,3,3',4,4',5,5'-Heptachlorobiphenyl (#189)	390	pg / gram fat	U+/-	37%

Results given behind the less than sign are the limit of quantification.

compound out of recovery range

3,3',4,4',5-Pentachlorobiphenyl (#126)	48.8%

Fruit

5 PFAS

Analysecertificaat

Normec Groen Agro Control

KLANT

Klantnaam	: ToxicoWatch Consultancy Abraham Kuyperstraat 6 8862 VS HARLINGEN
Klantnummer	: 11492
Klantlocatie*	: ToxicoWatch Consultancy

RAPPORT

Rapportnummer	: C6637355	Bemonsterd	: niet door NGAC
Monstercode	: BPV240226165		
Datum ontvangst	: 26-2-2024		
Startdatum analyse	: 26-2-2024		
Datum rapport	: 4-3-2024		
Gebruikte methoden	: PFAS LCMSMS (A195, eigen methode)		

MONSTER*

Omschrijving	: 23TWS-Ap-Dv01
Variëteit	: fruit - appel

De resultaten in het rapport zijn van toepassing op het onderzochte monster, zoals deze is ontvangen.

RESULTATEN

Methode	Component	Eenheid	Concentratie
PFAS LCMSMS	Perfluor-1-octaansulfonaat (PFOS) Q	µg/kg	<0.1
PFAS LCMSMS	Perfluor-n-octaanzuur (PFOA) Q	µg/kg	<0.1
PFAS LCMSMS	Perfluor-n-nonaanzuur (PFNA) Q	µg/kg	<0.1
PFAS LCMSMS	Perfluor-1-hexaansulfonaat (PFHxS) Q	µg/kg	<0.1
PFAS LCMSMS	Perfluor-n-butaanzuur (PFBA) Q	µg/kg	<0.5
PFAS LCMSMS	Perfluor-n-pentaanzuur (PFPeA) Q	µg/kg	<0.1
PFAS LCMSMS	Perfluor-n-hexaanzuur (PFHxA) Q	µg/kg	<0.1
PFAS LCMSMS	Perfluor-n-heptaanzuur (PFHpA) Q	µg/kg	<0.1
PFAS LCMSMS	Perfluor-n-decaanzuur (PFDA) Q	µg/kg	<0.1
PFAS LCMSMS	Perfluor-n-undecaanzuur (PFUnDA) Q	µg/kg	<0.1
PFAS LCMSMS	Perfluor-n-dodecaanzuur (PFDoA) Q	µg/kg	<0.1
PFAS LCMSMS	Perfluor-n-tridecaanzuur (PFTrDA) Q	µg/kg	<0.1
PFAS LCMSMS	Perfluor-n-tetradecaanzuur (PFTeDA) Q	µg/kg	<0.1
PFAS LCMSMS	Perfluor-1-butaansulfonaat (PFBS) Q	µg/kg	<0.1
PFAS LCMSMS	Perfluor-1-heptaansulfonaat (PFHpS) Q	µg/kg	<0.1
PFAS LCMSMS	Perfluor-1-decaansulfonaat (PFDS) Q	µg/kg	<0.1
PFAS LCMSMS	Perfluor-1-dodecaansulfonaat (PFDoS) Q	µg/kg	<0.1
PFAS LCMSMS	Perfluor-1-nonaansulfonaat (PFNS) Q	µg/kg	<0.1
PFAS LCMSMS	Perfluor-1-pentaansulfonaat (PFPeS) Q	µg/kg	<0.1
PFAS LCMSMS	Perfluorhexaansulfonaat (4:2FTS) Q	µg/kg	<0.1
PFAS LCMSMS	Perfluoroctaansulfonaat (6:2FTS) Q	µg/kg	<0.1
PFAS LCMSMS	Perfluordecaansulfonaat (8:2FTS) Q	µg/kg	<0.1
PFAS LCMSMS	Hexafluorpropyleenoxide dimeer zuur (HFPO-DA of GenX) Q	µg/kg	<0.1

* informatie verkregen van de klant

Algemeen directeur

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Analysecertificaat

Normec
Groen Agro Control

KLANT

Klantnaam	: ToxicoWatch Consultancy Abraham Kuyperstraat 6 8862 VS HARLINGEN
Klantnummer	: 11492
Klantlocatie*	: ToxicoWatch Consultancy

RAPPORT

Rapportnummer	: C6637356	Bemonsterd	: niet door NGAC
Monstercode	: BPV240226167		
Datum ontvangst	: 26-2-2024		
Startdatum analyse	: 26-2-2024		
Datum rapport	: 4-3-2024		
Gebruikte methoden	: PFAS LCMSMS (A195, eigen methode)		

MONSTER*

Omschrijving	: 23TWS-Grp-Dv01
Variëteit	: fruit - druif

De resultaten in het rapport zijn van toepassing op het onderzochte monster, zoals deze is ontvangen.

RESULTATEN

Methode	Component	Eenheid	Concentratie
PFAS LCMSMS	Perfluor-1-octaansulfonaat (PFOS) Q	µg/kg	<0.1
PFAS LCMSMS	Perfluor-n-octaanzuur (PFOA) Q	µg/kg	<0.1
PFAS LCMSMS	Perfluor-n-nonaanzuur (PFNA) Q	µg/kg	<0.1
PFAS LCMSMS	Perfluor-1-hexaansulfonaat (PFHxS) Q	µg/kg	<0.1
PFAS LCMSMS	Perfluor-n-butaanzuur (PFBA) Q	µg/kg	<0.5
PFAS LCMSMS	Perfluor-n-pentaanzuur (PFPeA) Q	µg/kg	<0.1
PFAS LCMSMS	Perfluor-n-hexaanzuur (PFHxA) Q	µg/kg	<0.1
PFAS LCMSMS	Perfluor-n-heptaanzuur (PFHpA) Q	µg/kg	<0.1
PFAS LCMSMS	Perfluor-n-decaanzuur (PFDA) Q	µg/kg	<0.1
PFAS LCMSMS	Perfluor-n-undecaanzuur (PFUnDA) Q	µg/kg	<0.1
PFAS LCMSMS	Perfluor-n-dodecaanzuur (PFDoA) Q	µg/kg	<0.1
PFAS LCMSMS	Perfluor-n-tridecaanzuur (PFTrDA) Q	µg/kg	<0.1
PFAS LCMSMS	Perfluor-n-tetradecaanzuur (PFTeDA) Q	µg/kg	<0.1
PFAS LCMSMS	Perfluor-1-butaansulfonaat (PFBS) Q	µg/kg	<0.1
PFAS LCMSMS	Perfluor-1-heptaansulfonaat (PFHpS) Q	µg/kg	<0.1
PFAS LCMSMS	Perfluor-1-decaansulfonaat (PFDS) Q	µg/kg	<0.1
PFAS LCMSMS	Perfluor-1-dodecaansulfonaat (PFDoS) Q	µg/kg	<0.1
PFAS LCMSMS	Perfluor-1-nonaansulfonaat (PFNS) Q	µg/kg	<0.1
PFAS LCMSMS	Perfluor-1-pentaansulfonaat (PFPeS) Q	µg/kg	<0.1
PFAS LCMSMS	Perfluorhexaansulfonaat (4:2FTS) Q	µg/kg	<0.1
PFAS LCMSMS	Perfluoroctaansulfonaat (6:2FTS) Q	µg/kg	<0.1
PFAS LCMSMS	Perfluordecaansulfonaat (8:2FTS) Q	µg/kg	<0.1
PFAS LCMSMS	Hexafluorpropyleenoxide dimeer zuur (HFPO-DA of GenX) Q	µg/kg	<0.1

* informatie verkregen van de klant

Algemeen directeur

ir. J. de Vriend

Analysecertificaat

Normec
Groen Agro Control

KLANT

Klantnaam	: ToxicoWatch Consultancy Abraham Kuyperstraat 6 8862 VS HARLINGEN
Klantnummer	: 11492
Klantlocatie*	: ToxicoWatch Consultancy

RAPPORT

Rapportnummer	: C6637357	Bemonsterd	: niet door NGAC
Monstercode	: BPV240226168		
Datum ontvangst	: 26-2-2024		
Startdatum analyse	: 26-2-2024		
Datum rapport	: 4-3-2024		
Gebruikte methoden	: PFAS LCMSMS (A195, eigen methode)		

MONSTER*

Omschrijving	: 23TWS-Grp-Vc01
Variëteit	: fruit - druif

De resultaten in het rapport zijn van toepassing op het onderzochte monster, zoals deze is ontvangen.

RESULTATEN

Methode	Component	Eenheid	Concentratie
PFAS LCMSMS	Perfluor-1-octaansulfonaat (PFOS) Q	µg/kg	<0.1
PFAS LCMSMS	Perfluor-n-octaanzuur (PFOA) Q	µg/kg	<0.1
PFAS LCMSMS	Perfluor-n-nonaanzuur (PFNA) Q	µg/kg	<0.1
PFAS LCMSMS	Perfluor-1-hexaansulfonaat (PFHxS) Q	µg/kg	<0.1
PFAS LCMSMS	Perfluor-n-butaanzuur (PFBA) Q	µg/kg	<0.5
PFAS LCMSMS	Perfluor-n-pentaanzuur (PFPeA) Q	µg/kg	<0.1
PFAS LCMSMS	Perfluor-n-hexaanzuur (PFHxA) Q	µg/kg	<0.1
PFAS LCMSMS	Perfluor-n-heptaanzuur (PFHpA) Q	µg/kg	<0.1
PFAS LCMSMS	Perfluor-n-decaanzuur (PFDA) Q	µg/kg	<0.1
PFAS LCMSMS	Perfluor-n-undecaanzuur (PFUnDA) Q	µg/kg	<0.1
PFAS LCMSMS	Perfluor-n-dodecaanzuur (PFDoA) Q	µg/kg	<0.1
PFAS LCMSMS	Perfluor-n-tridecaanzuur (PFTrDA) Q	µg/kg	<0.1
PFAS LCMSMS	Perfluor-n-tetradecaanzuur (PFTeDA) Q	µg/kg	<0.1
PFAS LCMSMS	Perfluor-1-butaansulfonaat (PFBS) Q	µg/kg	<0.1
PFAS LCMSMS	Perfluor-1-heptaansulfonaat (PFHpS) Q	µg/kg	<0.1
PFAS LCMSMS	Perfluor-1-decaansulfonaat (PFDS) Q	µg/kg	<0.1
PFAS LCMSMS	Perfluor-1-dodecaansulfonaat (PFDoS) Q	µg/kg	<0.1
PFAS LCMSMS	Perfluor-1-nonaansulfonaat (PFNS) Q	µg/kg	<0.1
PFAS LCMSMS	Perfluor-1-pentaansulfonaat (PFPeS) Q	µg/kg	<0.1
PFAS LCMSMS	Perfluorhexaansulfonaat (4:2FTS) Q	µg/kg	<0.1
PFAS LCMSMS	Perfluoroctaansulfonaat (6:2FTS) Q	µg/kg	0.14
PFAS LCMSMS	Perfluordecaansulfonaat (8:2FTS) Q	µg/kg	<0.1
PFAS LCMSMS	Hexafluorpropyleenoxide dimeer zuur (HFPO-DA of GenX) Q	µg/kg	<0.1

* informatie verkregen van de klant

TESTEN RvA L 335

Normec Groen Agro Control is ingeschreven in het register van de Raad voor Accreditatie voor testlaboratoria onder nr. L335 conform ISO/IEC 17025. De met 'Q' gemarkeerde parameters zijn onder accreditatie geanalyseerd. Details over de gebruikte methoden en meetonzekerheid per parameter zijn beschikbaar op aanvraag.
Dit rapport mag zonder schriftelijke toestemming niet anders dan in zijn geheel worden gereproduceerd.

Algemeen directeur

ir. J. de Vriend

Analysecertificaat

Normec
Groen Agro Control

KLANT

Klantnaam	: ToxicoWatch Consultancy Abraham Kuyperstraat 6 8862 VS HARLINGEN
Klantnummer	: 11492
Klantlocatie*	: ToxicoWatch Consultancy

RAPPORT

Rapportnummer	: C6637358	Bemonsterd	: niet door NGAC
Monstercode	: BPV240226169		
Datum ontvangst	: 26-2-2024		
Startdatum analyse	: 26-2-2024		
Datum rapport	: 4-3-2024		
Gebruikte methoden	: PFAS LCMSMS (A195, eigen methode)		

MONSTER*

Omschrijving	: 23TWS_Fig-02-Dv02
Variëteit	: pine needles

De resultaten in het rapport zijn van toepassing op het onderzochte monster, zoals deze is ontvangen.

RESULTATEN

Methode	Component	Eenheid	Concen-tratie
PFAS LCMSMS	Perfluor-1-octaansulfonaat (PFOS)	µg/kg	<0.1
PFAS LCMSMS	Perfluor-n-octaanzuur (PFOA)	µg/kg	<0.1
PFAS LCMSMS	Perfluor-n-nonaanzuur (PFNA)	µg/kg	<0.1
PFAS LCMSMS	Perfluor-1-hexaansulfonaat (PFHxS)	µg/kg	<0.1
PFAS LCMSMS	Perfluor-n-butaanzuur (PFBA)	µg/kg	<0.5
PFAS LCMSMS	Perfluor-n-pentaanzuur (PFPeA)	µg/kg	<0.1
PFAS LCMSMS	Perfluor-n-hexaanzuur (PFHxA)	µg/kg	<0.1
PFAS LCMSMS	Perfluor-n-heptaanzuur (PFHpA)	µg/kg	<0.1
PFAS LCMSMS	Perfluor-n-decaanzuur (PFDA)	µg/kg	<0.1
PFAS LCMSMS	Perfluor-n-undecaanzuur (PFUnDA)	µg/kg	<0.1
PFAS LCMSMS	Perfluor-n-dodecaanzuur (PFDoA)	µg/kg	<0.1
PFAS LCMSMS	Perfluor-n-tridecaanzuur (PFTrDA)	µg/kg	<0.1
PFAS LCMSMS	Perfluor-n-tetradecaanzuur (PFTeDA)	µg/kg	<0.1
PFAS LCMSMS	Perfluor-1-butaansulfonaat (PFBS)	µg/kg	<0.1
PFAS LCMSMS	Perfluor-1-heptaansulfonaat (PFHpS)	µg/kg	<0.1
PFAS LCMSMS	Perfluor-1-decaansulfonaat (PFDS)	µg/kg	<0.1
PFAS LCMSMS	Perfluor-1-dodecaansulfonaat (PFDoS)	µg/kg	<0.1
PFAS LCMSMS	Perfluor-1-nonaansulfonaat (PFNS)	µg/kg	<0.1
PFAS LCMSMS	Perfluor-1-pentaansulfonaat (PFPeS)	µg/kg	<0.1
PFAS LCMSMS	Perfluorhexaansulfonaat (4:2FTS)	µg/kg	<0.1
PFAS LCMSMS	Perfluoroctaansulfonaat (6:2FTS)	µg/kg	0.22
PFAS LCMSMS	Perfluordecaansulfonaat (8:2FTS)	µg/kg	<0.1
PFAS LCMSMS	Hexafluorpropyleenoxide dimeer zuur (HFPO-DA of GenX)	µg/kg	<0.1

* informatie verkregen van de klant

Algemeen directeur

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KLANT

Klantnaam	: ToxicoWatch Consultancy Abraham Kuyperstraat 6 8862 VS HARLINGEN
Klantnummer	: 11492
Klantlocatie*	: ToxicoWatch Consultancy

RAPPORT

Rapportnummer	: C6636890	Bemonsterd	: niet door NGAC
Monstercode	: BPV240228567		
Datum ontvangst	: 28-2-2024		
Startdatum analyse	: 28-2-2024		
Datum rapport	: 1-3-2024		
Gebruikte methoden	: PFAS LCMSMS (A195, eigen methode)		

MONSTER*

Omschrijving	: 23TWS-Ap-TnB01
Variëteit	: Fruit - appel

De resultaten in het rapport zijn van toepassing op het onderzochte monster, zoals deze is ontvangen.

RESULTATEN

Methode	Component	Eenheid	Concen-tratie
PFAS LCMSMS	Perfluor-1-octaansulfonaat (PFOS) Q	µg/kg	<0.1
PFAS LCMSMS	Perfluor-n-octaanzuur (PFOA) Q	µg/kg	<0.1
PFAS LCMSMS	Perfluor-n-nonaanzuur (PFNA) Q	µg/kg	<0.1
PFAS LCMSMS	Perfluor-1-hexaansulfonaat (PFHxS) Q	µg/kg	<0.1
PFAS LCMSMS	Perfluor-n-butaanzuur (PFBA) Q	µg/kg	<0.5
PFAS LCMSMS	Perfluor-n-pentaanzuur (PFPeA) Q	µg/kg	<0.1
PFAS LCMSMS	Perfluor-n-hexaanzuur (PFHxA) Q	µg/kg	<0.1
PFAS LCMSMS	Perfluor-n-heptaanzuur (PFHpA) Q	µg/kg	<0.1
PFAS LCMSMS	Perfluor-n-decaanzuur (PFDA) Q	µg/kg	<0.1
PFAS LCMSMS	Perfluor-n-undecaanzuur (PFUnDA) Q	µg/kg	<0.1
PFAS LCMSMS	Perfluor-n-dodecaanzuur (PFDoA) Q	µg/kg	<0.1
PFAS LCMSMS	Perfluor-n-tridecaanzuur (PFTrDA) Q	µg/kg	<0.1
PFAS LCMSMS	Perfluor-n-tetradecaanzuur (PFTeDA) Q	µg/kg	<0.1
PFAS LCMSMS	Perfluor-1-butaansulfonaat (PFBS) Q	µg/kg	<0.1
PFAS LCMSMS	Perfluor-1-heptaansulfonaat (PFHpS) Q	µg/kg	<0.1
PFAS LCMSMS	Perfluor-1-decaansulfonaat (PFDS) Q	µg/kg	<0.1
PFAS LCMSMS	Perfluor-1-dodecaansulfonaat (PFDoS) Q	µg/kg	<0.1
PFAS LCMSMS	Perfluor-1-nonaansulfonaat (PFNS) Q	µg/kg	<0.1
PFAS LCMSMS	Perfluor-1-pentaansulfonaat (PFPeS) Q	µg/kg	<0.1
PFAS LCMSMS	Perfluorhexaansulfonaat (4:2FTS) Q	µg/kg	<0.1
PFAS LCMSMS	Perfluoroctaansulfonaat (6:2FTS) Q	µg/kg	<0.1
PFAS LCMSMS	Perfluordecaansulfonaat (8:2FTS) Q	µg/kg	<0.1
PFAS LCMSMS	Hexafluorpropyleenoxide dimeer zuur (HFPO-DA of GenX) Q	µg/kg	<0.1

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Eggs

4 PFAS

Analysecertificaat

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KLANT

Klantnaam	: ToxicoWatch Consultancy Abraham Kuyperstraat 6 8862 VS HARLINGEN
Klantnummer	: 11492
Klantlocatie*	: ToxicoWatch Consultancy

RAPPORT

Rapportnummer	: C6637378	Bemonsterd	: niet door NGAC
Monstercode	: BPV240226157		
Datum ontvangst	: 26-2-2024		
Startdatum analyse	: 4-3-2024		
Datum rapport	: 4-3-2024		
Gebruikte methoden	: PFAS LCMSMS (A195, eigen methode)		

MONSTER*

Omschrijving	: 23TWS-EGG-DV-02
Variëteit	: Egg

De resultaten in het rapport zijn van toepassing op het onderzochte monster, zoals deze is ontvangen.

RESULTATEN

Methode	Component	Eenheid	Concen-tratie	Norm EU	Norm EU %
PFAS LCMSMS	Perfluor-1-octaansulfonzuur (PFOS) Q	µg/kg	0.43	1.0	43.0
PFAS LCMSMS	Perfluor-n-octaanzuur (PFOA) Q	µg/kg	<0.1		
PFAS LCMSMS	Perfluor-n-nonaanzuur (PFNA) Q	µg/kg	<0.1		
PFAS LCMSMS	Perfluor-1-hexaansulfonzuur (PFHxS) Q	µg/kg	<0.1		
PFAS LCMSMS	Som van PFOS, PFOA, PFNA en PFHxS	µg/kg	0.43	1.7	25.3
PFAS LCMSMS	Perfluor-n-butaanzuur (PFBA) Q	µg/kg	<0.5		
PFAS LCMSMS	Perfluor-n-pentaanzuur (PFPeA) Q	µg/kg	<0.1		
PFAS LCMSMS	Perfluor-n-hexaanzuur (PFHxA) Q	µg/kg	<0.1		
PFAS LCMSMS	Perfluor-n-heptaanzuur (PFHpA) Q	µg/kg	<0.1		
PFAS LCMSMS	Perfluor-n-decaanzuur (PFDA) Q	µg/kg	<0.1		
PFAS LCMSMS	Perfluor-n-undecaanzuur (PFUnDA) Q	µg/kg	<0.1		
PFAS LCMSMS	Perfluor-n-dodecaanzuur (PFDoA) Q	µg/kg	<0.1		
PFAS LCMSMS	Perfluor-n-tridecaanzuur (PFTrDA) Q	µg/kg	<0.1		
PFAS LCMSMS	Perfluor-n-tetradecaanzuur (PFTeDA) Q	µg/kg	<0.1		
PFAS LCMSMS	Perfluor-1-butaansulfonzuur (PFBS) Q	µg/kg	<0.1		
PFAS LCMSMS	Perfluor-1-heptaansulfonzuur (PFHpS) Q	µg/kg	<0.1		
PFAS LCMSMS	Perfluor-1-decaansulfonzuur (PFDS) Q	µg/kg	<0.1		
PFAS LCMSMS	Perfluor-1-dodecaansulfonzuur (PFDoS) Q	µg/kg	<0.1		
PFAS LCMSMS	Perfluor-1-nonaansulfonzuur (PFNS) Q	µg/kg	<0.1		
PFAS LCMSMS	Perfluor-1-pentaansulfonzuur (PFPeS) Q	µg/kg	<0.1		
PFAS LCMSMS	4:2 Fluortelomeersulfonzuur (4:2FTS) Q	µg/kg	<0.1		
PFAS LCMSMS	6:2 Fluortelomeersulfonzuur (6:2FTS) Q	µg/kg	<0.1		
PFAS LCMSMS	8:2 Fluortelomeersulfonzuur (8:2FTS) Q	µg/kg	<0.1		
PFAS LCMSMS	Hexafluorpropyleenoxide dimeer zuur (HFPO-DA of GenX) Q	µg/kg	<0.1		

* informatie verkregen van de klant
Norm EU: Het maximumgehalte conform verordening (EG) nr. 2023/915, geconsolideerde versie.

TESTEN RvA L 335

Normec Groen Agro Control is ingeschreven in het register van de Raad voor Accreditatie voor testlaboratoria onder nr. L335 conform ISO/IEC 17025. De met 'Q' gemarkeerde parameters zijn onder accreditatie geanalyseerd. Details over de gebruikte methoden en meetonzekerheid per parameter zijn beschikbaar op aanvraag.
Dit rapport mag zonder schriftelijke toestemming niet anders dan in zijn geheel worden gereproduceerd.

Algemeen directeur

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Analysecertificaat

Normec
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KLANT

Klantnaam	: ToxicoWatch Consultancy Abraham Kuyperstraat 6 8862 VS HARLINGEN
Klantnummer	: 11492
Klantlocatie*	: ToxicoWatch Consultancy

RAPPORT

Rapportnummer	: C6637381	Bemonsterd	: niet door NGAC
Monstercode	: BPV240226160		
Datum ontvangst	: 26-2-2024		
Startdatum analyse	: 26-2-2024		
Datum rapport	: 4-3-2024		
Gebruikte methoden	: PFAS LCMSMS (A195, eigen methode)		

MONSTER*

Omschrijving	: 23TWS-EGG-HS-01
Variëteit	: Egg

De resultaten in het rapport zijn van toepassing op het onderzochte monster, zoals deze is ontvangen.

RESULTATEN

Methode	Component	Eenheid	Concen-tratie	Norm EU	Norm EU %
PFAS LCMSMS	Perfluor-1-octaansulfonzuur (PFOS) Q	µg/kg	0.43	1.0	43.0
PFAS LCMSMS	Perfluor-n-octaanzuur (PFOA) Q	µg/kg	<0.1		
PFAS LCMSMS	Perfluor-n-nonaanzuur (PFNA) Q	µg/kg	<0.1		
PFAS LCMSMS	Perfluor-1-hexaansulfonzuur (PFHxS) Q	µg/kg	<0.1		
PFAS LCMSMS	Som van PFOS, PFOA, PFNA en PFHxS	µg/kg	0.43	1.7	25.3
PFAS LCMSMS	Perfluor-n-butaanzuur (PFBA) Q	µg/kg	<0.5		
PFAS LCMSMS	Perfluor-n-pentaanzuur (PFPeA) Q	µg/kg	<0.1		
PFAS LCMSMS	Perfluor-n-hexaanzuur (PFHxA) Q	µg/kg	<0.1		
PFAS LCMSMS	Perfluor-n-heptaanzuur (PFHpA) Q	µg/kg	<0.1		
PFAS LCMSMS	Perfluor-n-decaanzuur (PFDA) Q	µg/kg	<0.1		
PFAS LCMSMS	Perfluor-n-undecaanzuur (PFUnDA) Q	µg/kg	<0.1		
PFAS LCMSMS	Perfluor-n-dodecaanzuur (PFDoA) Q	µg/kg	<0.1		
PFAS LCMSMS	Perfluor-n-tridecaanzuur (PFTrDA) Q	µg/kg	<0.1		
PFAS LCMSMS	Perfluor-n-tetradecaanzuur (PFTeDA) Q	µg/kg	<0.1		
PFAS LCMSMS	Perfluor-1-butaansulfonzuur (PFBS) Q	µg/kg	<0.1		
PFAS LCMSMS	Perfluor-1-heptaansulfonzuur (PFHpS) Q	µg/kg	<0.1		
PFAS LCMSMS	Perfluor-1-decaansulfonzuur (PFDS) Q	µg/kg	<0.1		
PFAS LCMSMS	Perfluor-1-dodecaansulfonzuur (PFDoS) Q	µg/kg	<0.1		
PFAS LCMSMS	Perfluor-1-nonaansulfonzuur (PFNS) Q	µg/kg	<0.1		
PFAS LCMSMS	Perfluor-1-pentaansulfonzuur (PFPeS) Q	µg/kg	<0.1		
PFAS LCMSMS	4:2 Fluortelomeersulfonzuur (4:2FTS) Q	µg/kg	<0.1		
PFAS LCMSMS	6:2 Fluortelomeersulfonzuur (6:2FTS) Q	µg/kg	<0.1		
PFAS LCMSMS	8:2 Fluortelomeersulfonzuur (8:2FTS) Q	µg/kg	<0.1		
PFAS LCMSMS	Hexafluorpropyleenoxide dimeer zuur (HFPO-DA of GenX) Q	µg/kg	<0.1		

* informatie verkregen van de klant
Norm EU: Het maximumgehalte conform verordening (EG) nr. 2023/915, geconsolideerde versie.

TESTEN RvA L 335

Normec Groen Agro Control is ingeschreven in het register van de Raad voor Accreditatie voor testlaboratoria onder nr. L335 conform ISO/IEC 17025. De met 'Q' gemarkeerde parameters zijn onder accreditatie geanalyseerd. Details over de gebruikte methoden en meetonzekerheid per parameter zijn beschikbaar op aanvraag.
Dit rapport mag zonder schriftelijke toestemming niet anders dan in zijn geheel worden gereproduceerd.

Algemeen directeur

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Analysecertificaat

Normec
Groen Agro Control

KLANT

Klantnaam	: ToxicoWatch Consultancy Abraham Kuyperstraat 6 8862 VS HARLINGEN
Klantnummer	: 11492
Klantlocatie*	: ToxicoWatch Consultancy

RAPPORT

Rapportnummer	: C6637380	Bemonsterd	: niet door NGAC
Monstercode	: BPV240226159		
Datum ontvangst	: 26-2-2024		
Startdatum analyse	: 26-2-2024		
Datum rapport	: 4-3-2024		
Gebruikte methoden	: PFAS LCMSMS (A195, eigen methode)		

MONSTER*

Omschrijving	: 23TWS-EGG-TNB-01
Variëteit	: Egg

De resultaten in het rapport zijn van toepassing op het onderzochte monster, zoals deze is ontvangen.

RESULTATEN

Methode	Component	Eenheid	Concen-tratie	Norm EU	Norm EU %
PFAS LCMSMS	Perfluor-1-octaansulfonzuur (PFOS) Q	µg/kg	0.75	1.0	75.0
PFAS LCMSMS	Perfluor-n-octaanzuur (PFOA) Q	µg/kg	<0.1		
PFAS LCMSMS	Perfluor-n-nonaanzuur (PFNA) Q	µg/kg	0.13	0.7	18.6
PFAS LCMSMS	Perfluor-1-hexaansulfonzuur (PFHxS) Q	µg/kg	<0.1		
PFAS LCMSMS	Som van PFOS, PFOA, PFNA en PFHxS	µg/kg	0.88	1.7	51.8
PFAS LCMSMS	Perfluor-n-butaanzuur (PFBA) Q	µg/kg	<0.5		
PFAS LCMSMS	Perfluor-n-pentaanzuur (PFPeA) Q	µg/kg	<0.1		
PFAS LCMSMS	Perfluor-n-hexaanzuur (PFHxA) Q	µg/kg	<0.1		
PFAS LCMSMS	Perfluor-n-heptaanzuur (PFHpA) Q	µg/kg	<0.1		
PFAS LCMSMS	Perfluor-n-decaanzuur (PFDA) Q	µg/kg	0.11		
PFAS LCMSMS	Perfluor-n-undecaanzuur (PFUnDA) Q	µg/kg	0.17		
PFAS LCMSMS	Perfluor-n-dodecaanzuur (PFDoA) Q	µg/kg	<0.1		
PFAS LCMSMS	Perfluor-n-tridecaanzuur (PFTrDA) Q	µg/kg	0.11		
PFAS LCMSMS	Perfluor-n-tetradecaanzuur (PFTeDA) Q	µg/kg	<0.1		
PFAS LCMSMS	Perfluor-1-butaansulfonzuur (PFBS) Q	µg/kg	<0.1		
PFAS LCMSMS	Perfluor-1-heptaansulfonzuur (PFHpS) Q	µg/kg	<0.1		
PFAS LCMSMS	Perfluor-1-decaansulfonzuur (PFDS) Q	µg/kg	<0.1		
PFAS LCMSMS	Perfluor-1-dodecaansulfonzuur (PFDoS) Q	µg/kg	<0.1		
PFAS LCMSMS	Perfluor-1-nonaansulfonzuur (PFNS) Q	µg/kg	<0.1		
PFAS LCMSMS	Perfluor-1-pentaansulfonzuur (PFPeS) Q	µg/kg	<0.1		
PFAS LCMSMS	4:2 Fluortelomeersulfonzuur (4:2FTS) Q	µg/kg	<0.1		
PFAS LCMSMS	6:2 Fluortelomeersulfonzuur (6:2FTS) Q	µg/kg	0.27		
PFAS LCMSMS	8:2 Fluortelomeersulfonzuur (8:2FTS) Q	µg/kg	<0.1		
PFAS LCMSMS	Hexafluorpropyleenoxide dimeer zuur (HFPO-DA of GenX) Q	µg/kg	<0.1		

* informatie verkregen van de klant

Norm EU: Het maximumgehalte conform verordening (EG) nr. 2023/915, geconsolideerde versie.

RvA TESTEN RvA L 335

Normec Groen Agro Control is ingeschreven in het register van de Raad voor Accreditatie voor testlaboratoria onder nr. L335 conform ISO/IEC 17025. De met 'Q' gemarkeerde parameters zijn onder accreditatie geanalyseerd. Details over de gebruikte methoden en meetonzekerheid per parameter zijn beschikbaar op aanvraag.
Dit rapport mag zonder schriftelijke toestemming niet anders dan in zijn geheel worden gereproduceerd.

Algemeen directeur

ir. J. de Vriend

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Analysecertificaat

Normec
Groen Agro Control

KLANT

Klantnaam	: ToxicoWatch Consultancy Abraham Kuyperstraat 6 8862 VS HARLINGEN
Klantnummer	: 11492
Klantlocatie*	: ToxicoWatch Consultancy

RAPPORT

Rapportnummer	: C6637379	Bemonsterd	: niet door NGAC
Monstercode	: BPV240226158		
Datum ontvangst	: 26-2-2024		
Startdatum analyse	: 26-2-2024		
Datum rapport	: 4-3-2024		
Gebruikte methoden	: PFAS LCMSMS (A195, eigen methode)		

MONSTER*

Omschrijving	: 23TWS-EGG-ZA-02
Variëteit	: Egg

De resultaten in het rapport zijn van toepassing op het onderzochte monster, zoals deze is ontvangen.

RESULTATEN

Methode	Component	Eenheid	Concen-tratie	Norm EU	Norm EU %
PFAS LCMSMS	Perfluor-1-octaansulfonzuur (PFOS) Q	µg/kg	**3.0**	1.0	300
PFAS LCMSMS	Perfluor-n-octaanzuur (PFOA) Q	µg/kg	<0.1		
PFAS LCMSMS	Perfluor-n-nonaanzuur (PFNA) Q	µg/kg	<0.1		
PFAS LCMSMS	Perfluor-1-hexaansulfonzuur (PFHxS) Q	µg/kg	<0.1		
PFAS LCMSMS	Som van PFOS, PFOA, PFNA en PFHxS	µg/kg	**3.0**	1.7	176
PFAS LCMSMS	Perfluor-n-butaanzuur (PFBA) Q	µg/kg	<0.5		
PFAS LCMSMS	Perfluor-n-pentaanzuur (PFPeA) Q	µg/kg	<0.1		
PFAS LCMSMS	Perfluor-n-hexaanzuur (PFHxA) Q	µg/kg	<0.1		
PFAS LCMSMS	Perfluor-n-heptaanzuur (PFHpA) Q	µg/kg	<0.1		
PFAS LCMSMS	Perfluor-n-decaanzuur (PFDA) Q	µg/kg	<0.1		
PFAS LCMSMS	Perfluor-n-undecaanzuur (PFUnDA) Q	µg/kg	0.15		
PFAS LCMSMS	Perfluor-n-dodecaanzuur (PFDoA) Q	µg/kg	<0.1		
PFAS LCMSMS	Perfluor-n-tridecaanzuur (PFTrDA) Q	µg/kg	0.12		
PFAS LCMSMS	Perfluor-n-tetradecaanzuur (PFTeDA) Q	µg/kg	<0.1		
PFAS LCMSMS	Perfluor-1-butaansulfonzuur (PFBS) Q	µg/kg	<0.1		
PFAS LCMSMS	Perfluor-1-heptaansulfonzuur (PFHpS) Q	µg/kg	<0.1		
PFAS LCMSMS	Perfluor-1-decaansulfonzuur (PFDS) Q	µg/kg	<0.1		
PFAS LCMSMS	Perfluor-1-dodecaansulfonzuur (PFDoS) Q	µg/kg	<0.1		
PFAS LCMSMS	Perfluor-1-nonaansulfonzuur (PFNS) Q	µg/kg	<0.1		
PFAS LCMSMS	Perfluor-1-pentaansulfonzuur (PFPeS) Q	µg/kg	<0.1		
PFAS LCMSMS	4:2 Fluortelomeersulfonzuur (4:2FTS) Q	µg/kg	<0.1		
PFAS LCMSMS	6:2 Fluortelomeersulfonzuur (6:2FTS) Q	µg/kg	<0.1		
PFAS LCMSMS	8:2 Fluortelomeersulfonzuur (8:2FTS) Q	µg/kg	<0.1		
PFAS LCMSMS	Hexafluorpropyleenoxide dimeer zuur (HFPO-DA of GenX) Q	µg/kg	<0.1		

* informatie verkregen van de klant

Norm EU: Het maximumgehalte conform verordening (EG) nr. 2023/915, geconsolideerde versie.

RvA TESTEN L 335

Normec Groen Agro Control is ingeschreven in het register van de Raad voor Accreditatie voor testlaboratoria onder nr. L335 conform ISO/IEC 17025. De met 'Q' gemarkeerde parameters zijn onder accreditatie geanalyseerd. Details over de gebruikte methoden en meetonzekerheid per parameter zijn beschikbaar op aanvraag.

Algemeen directeur

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Fruit

PAH 2 x

Pine needles

PAH 1 x

Mos

PAH 7 x

Analysis certificate

Normec Groen Agro Control

CUSTOMER

Customer name	: ToxicoWatch Consultancy Abraham Kuyperstraat 6 8862 VS HARLINGEN
Customer no.	: 11492
Customer location*	: ToxicoWatch Consultancy

REPORT

Report code	: C6642576	Sampled by	: not by NGAC
Sample code	: U183240228569		
Date of receipt	: 28-2-2024		
Analysis start date	: 28-2-2024		
Report date	: 14-3-2024		

SAMPLE*

Description	: 23TWS-Grp-Vc01
Variety	: Fruit - druif

The results in the report apply to the investigated sample as received.

PAHs analysis	Results	Unit	Method
Acenaphthylene	<1,0	µg/kg	GC-MS/MS
Acenaphthene	<1,0	µg/kg	
Fluoren	<1,0	µg/kg	
Phenanthrene	9,5	µg/kg	
Anthracene	1,5	µg/kg	
Fluoranthene	8,6	µg/kg	
Pyren	6,7	µg/kg	
Benzo(a)anthracene	<1,0	µg/kg	
Chrysen	1,2	µg/kg	
Benzo(b)fluoranthene	<1,0	µg/kg	
Benzo(k)fluoranthene	<1,0	µg/kg	
Benzo(a)pyrene	<1,0	µg/kg	
Dibenz(ah)anthracene	<1,0	µg/kg	
Benzo(g,h,i)perylene	<1,0	µg/kg	
Indeno(1,2,3cd)pyrene	<1,0	µg/kg	
Sum Chr, B(b)f, B(a)p, B(a)a	1,2	µg/kg	

* information provided by customer

Disclaimer

The analysis on this sample have been outsourced.

General manager

ir. J. de Vriend

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Analysis certificate

Normec Groen Agro Control

CUSTOMER

Customer name : ToxicoWatch Consultancy
Abraham Kuyperstraat 6
8862 VS HARLINGEN
Customer no. : 11492
Customer location* : ToxicoWatch Consultancy

REPORT

Report code : C6642575
Sample code : U183240228568
Date of receipt : 28-2-2024
Analysis start date : 28-2-2024
Report date : 14-3-2024
Sampled by : not by NGAC

SAMPLE*

Description : 23TWS-Grp-Dv01
Variety : Fruit - druif
The results in the report apply to the investigated sample as received.

PAHs analysis	Results	Unit	Method
Acenaphthylene	<1,0	µg/kg	GC-MS/MS
Acenaphthene	<1,0	µg/kg	
Fluoren	<1,0	µg/kg	
Phenanthrene	4,8	µg/kg	
Anthracene	<1,0	µg/kg	
Fluoranthene	4,8	µg/kg	
Pyren	3,5	µg/kg	
Benzo(a)anthracene	<1,0	µg/kg	
Chrysen	<1,0	µg/kg	
Benzo(b)fluoranthene	<1,0	µg/kg	
Benzo(k)fluoranthene	<1,0	µg/kg	
Benzo(a)pyrene	<1,0	µg/kg	
Dibenz(ah)anthracene	<1,0	µg/kg	
Benzo(g,h,i)perylene	<1,0	µg/kg	
Indeno(1,2,3cd)pyrene	<1,0	µg/kg	
Sum Chr, B(b)f, B(a)p, B(a)a	--	µg/kg	

* information provided by customer

Disclaimer

The analysis on this sample have been outsourced.

General manager

ir. J. de Vriend

MOS

7 x PAH

Analysis certificate

Normec Groen Agro Control

CUSTOMER

Customer name : ToxicoWatch Consultancy
Abraham Kuyperstraat 6
8862 VS HARLINGEN
Customer no. : 11492
Customer location* : ToxicoWatch Consultancy

REPORT

Report code : C6642134
Sample code : U183240226171
Date of receipt : 26-2-2024
Analysis start date : 26-2-2024
Report date : 14-3-2024
Sampled by : not by NGAC

SAMPLE*

Description : 23TWS-PN-DV01
Variety : Mos

The results in the report apply to the investigated sample as received.

PAHs analysis	Results	Unit	Method
Acenaphthylene	<1,0	µg/kg	GC-MS/MS
Acenaphthene	<1,0	µg/kg	
Fluoren	<1,0	µg/kg	
Phenanthrene	6,0	µg/kg	
Anthracene	<1,0	µg/kg	
Fluoranthene	9,2	µg/kg	
Pyren	12,0	µg/kg	
Benzo(a)anthracene	3,0	µg/kg	
Chrysen	8,5	µg/kg	
Benzo(b)fluoranthene	2,6	µg/kg	
Benzo(k)fluoranthene	1,2	µg/kg	
Benzo(a)pyrene	<1,0	µg/kg	
Dibenz(ah)anthracene	<1,0	µg/kg	
Benzo(g,h,i)perylene	<1,0	µg/kg	
Indeno(1,2,3cd)pyrene	<1,0	µg/kg	
Sum Chr, B(b)f, B(a)p, B(a)a	14,1	µg/kg	

* information provided by customer

Disclaimer

The analysis on this sample have been outsourced.

General manager

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Analysis certificate

Normec Groen Agro Control

CUSTOMER

Customer name	: ToxicoWatch Consultancy Abraham Kuyperstraat 6 8862 VS HARLINGEN
Customer no.	: 11492
Customer location*	: ToxicoWatch Consultancy

REPORT

Report code	: C6642135	Sampled by	: not by NGAC
Sample code	: U183240226172		
Date of receipt	: 26-2-2024		
Analysis start date	: 26-2-2024		
Report date	: 14-3-2024		

SAMPLE*

Description	: 23TWS-MOS-DV03
Variety	: Mos

The results in the report apply to the investigated sample as received.

PAHs analysis	Results	Unit	Method
Acenaphthylene	<1,0	µg/kg	GC-MS/MS
Acenaphthene	<1,0	µg/kg	
Fluoren	<1,0	µg/kg	
Phenanthrene	5,6	µg/kg	
Anthracene	<1,0	µg/kg	
Fluoranthene	16,9	µg/kg	
Pyren	11,4	µg/kg	
Benzo(a)anthracene	2,8	µg/kg	
Chrysen	10,1	µg/kg	
Benzo(b)fluoranthene	14,0	µg/kg	
Benzo(k)fluoranthene	5,1	µg/kg	
Benzo(a)pyrene	5,7	µg/kg	
Dibenz(ah)anthracene	1,2	µg/kg	
Benzo(g,h,i)perylene	9,3	µg/kg	
Indeno(1,2,3cd)pyrene	11,2	µg/kg	
Sum Chr, B(b)f, B(a)p, B(a)a	32,6	µg/kg	

* information provided by customer

Disclaimer

The analysis on this sample have been outsourced.

General manager

ir. J. de Vriend

Analysis certificate

Normec
Groen Agro Control

CUSTOMER

Customer name	: ToxicoWatch Consultancy Abraham Kuyperstraat 6 8862 VS HARLINGEN
Customer no.	: 11492
Customer location*	: ToxicoWatch Consultancy

REPORT

Report code	: C6642136	Sampled by	: not by NGAC
Sample code	: U183240226173		
Date of receipt	: 26-2-2024		
Analysis start date	: 26-2-2024		
Report date	: 14-3-2024		

SAMPLE*

Description	: 23TWS-MOS-DV01
Variety	: Mos

The results in the report apply to the investigated sample as received.

PAHs analysis	Results	Unit	Method
Acenaphthylene	<1,0	µg/kg	GC-MS/MS
Acenaphthene	<1,0	µg/kg	
Fluoren	1,5	µg/kg	
Phenanthrene	32,2	µg/kg	
Anthracene	2,8	µg/kg	
Fluoranthene	95,5	µg/kg	
Pyren	68,7	µg/kg	
Benzo(a)anthracene	25,9	µg/kg	
Chrysen	53,7	µg/kg	
Benzo(b)fluoranthene	66,1	µg/kg	
Benzo(k)fluoranthene	24,3	µg/kg	
Benzo(a)pyrene	40,2	µg/kg	
Dibenz(ah)anthracene	6,2	µg/kg	
Benzo(g,h,i)perylene	46,2	µg/kg	
Indeno(1,2,3cd)pyrene	52,3	µg/kg	
Sum Chr, B(b)f, B(a)p, B(a)a	186	µg/kg	

* information provided by customer

Disclaimer

The analysis on this sample have been outsourced.

General manager

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Analysis certificate

Normec Groen Agro Control

CUSTOMER

Customer name	: ToxicoWatch Consultancy Abraham Kuyperstraat 6 8862 VS HARLINGEN
Customer no.	: 11492
Customer location*	: ToxicoWatch Consultancy

REPORT

Report code	: C6642137	Sampled by	: not by NGAC
Sample code	: U183240226174		
Date of receipt	: 26-2-2024		
Analysis start date	: 26-2-2024		
Report date	: 14-3-2024		

SAMPLE*

Description	: 23TWS-MOS-HS01
Variety	: Mos

The results in the report apply to the investigated sample as received.

PAHs analysis	Results	Unit	Method
Acenaphthylene	<1,0	µg/kg	GC-MS/MS
Acenaphthene	1,8	µg/kg	
Fluoren	1,3	µg/kg	
Phenanthrene	38,7	µg/kg	
Anthracene	5,1	µg/kg	
Fluoranthene	182	µg/kg	
Pyren	153	µg/kg	
Benzo(a)anthracene	82,1	µg/kg	
Chrysen	112	µg/kg	
Benzo(b)fluoranthene	131	µg/kg	
Benzo(k)fluoranthene	52,8	µg/kg	
Benzo(a)pyrene	97,6	µg/kg	
Dibenz(ah)anthracene	18,6	µg/kg	
Benzo(g,h,i)perylene	86,4	µg/kg	
Indeno(1,2,3cd)pyrene	103	µg/kg	
Sum Chr, B(b)f, B(a)p, B(a)a	423	µg/kg	

* information provided by customer

Disclaimer

The analysis on this sample have been outsourced.

General manager

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Analysis certificate

Normec
Groen Agro Control

CUSTOMER

Customer name	: ToxicoWatch Consultancy Abraham Kuyperstraat 6 8862 VS HARLINGEN
Customer no.	: 11492
Customer location*	: ToxicoWatch Consultancy

REPORT

Report code	: C6642138	Sampled by	: not by NGAC
Sample code	: U183240226175		
Date of receipt	: 26-2-2024		
Analysis start date	: 26-2-2024		
Report date	: 14-3-2024		

SAMPLE*

Description	: 23TWS-MOS-ZA02
Variety	: eierschaal

The results in the report apply to the investigated sample as received.

PAHs analysis	Results	Unit	Method
Acenaphthylene	<1,0	µg/kg	GC-MS/MS
Acenaphthene	<1,0	µg/kg	
Fluoren	1,3	µg/kg	
Phenanthrene	38,1	µg/kg	
Anthracene	3,2	µg/kg	
Fluoranthene	154	µg/kg	
Pyren	114	µg/kg	
Benzo(a)anthracene	35,8	µg/kg	
Chrysen	84,1	µg/kg	
Benzo(b)fluoranthene	123	µg/kg	
Benzo(k)fluoranthene	42,9	µg/kg	
Benzo(a)pyrene	68,7	µg/kg	
Dibenz(ah)anthracene	14,1	µg/kg	
Benzo(g,h,i)perylene	92,1	µg/kg	
Indeno(1,2,3cd)pyrene	113	µg/kg	
Sum Chr, B(b)f, B(a)p, B(a)a	312	µg/kg	

* information provided by customer

Disclaimer

The analysis on this sample have been outsourced.

General manager

ir. J. de Vriend

Analysis certificate

Normec
Groen Agro Control

CUSTOMER

Customer name : ToxicoWatch Consultancy
Abraham Kuyperstraat 6
8862 VS HARLINGEN
Customer no. : 11492
Customer location* : ToxicoWatch Consultancy

REPORT

Report code : C6642139
Sample code : U183240226176
Date of receipt : 26-2-2024
Analysis start date : 26-2-2024
Report date : 14-3-2024
Sampled by : not by NGAC

SAMPLE*

Description : 23TWS-MOS-VC01
Variety : eierschaal
The results in the report apply to the investigated sample as received.

PAHs analysis	Results	Unit	Method
Acenaphthylene	<1,0	µg/kg	GC-MS/MS
Acenaphthene	<1,0	µg/kg	
Fluoren	<1,0	µg/kg	
Phenanthrene	13,5	µg/kg	
Anthracene	1,3	µg/kg	
Fluoranthene	48,2	µg/kg	
Pyren	39,3	µg/kg	
Benzo(a)anthracene	16,3	µg/kg	
Chrysen	30,6	µg/kg	
Benzo(b)fluoranthene	42,3	µg/kg	
Benzo(k)fluoranthene	16,7	µg/kg	
Benzo(a)pyrene	27,4	µg/kg	
Dibenz(ah)anthracene	6,2	µg/kg	
Benzo(g,h,i)perylene	35,1	µg/kg	
Indeno(1,2,3cd)pyrene	35,2	µg/kg	
Sum Chr, B(b)f, B(a)p, B(a)a	117	µg/kg	

* information provided by customer

Disclaimer

The analysis on this sample have been outsourced.

General manager

ir. J. de Vriend

Analysis certificate

Normec
Groen Agro Control

CUSTOMER

Customer name	: ToxicoWatch Consultancy Abraham Kuyperstraat 6 8862 VS HARLINGEN
Customer no.	: 11492
Customer location*	: ToxicoWatch Consultancy

REPORT

Report code	: C6642577	Sampled by	: not by NGAC
Sample code	: U183240228570		
Date of receipt	: 28-2-2024		
Analysis start date	: 28-2-2024		
Report date	: 14-3-2024		

SAMPLE*

Description	: 23TWS-Mos-Hs01
Variety	: Mos

The results in the report apply to the investigated sample as received.

PAHs analysis	Results	Unit	Method
Acenaphthylene	1,2	µg/kg	GC-MS/MS
Acenaphthene	2,4	µg/kg	
Fluoren	2,5	µg/kg	
Phenanthrene	50,7	µg/kg	
Anthracene	6,7	µg/kg	
Fluoranthene	147	µg/kg	
Pyren	123	µg/kg	
Benzo(a)anthracene	56,3	µg/kg	
Chrysen	83,4	µg/kg	
Benzo(b)fluoranthene	99,4	µg/kg	
Benzo(k)fluoranthene	36,9	µg/kg	
Benzo(a)pyrene	63,9	µg/kg	
Dibenz(ah)anthracene	11,9	µg/kg	
Benzo(g,h,i)perylene	66,6	µg/kg	
Indeno(1,2,3cd)pyrene	63,4	µg/kg	
Sum Chr, B(b)f, B(a)p, B(a)a	303	µg/kg	

* information provided by customer

Disclaimer

The analysis on this sample have been outsourced.

General manager

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Analysis certificate

Normec Groen Agro Control

CUSTOMER

Customer name	: ToxicoWatch Consultancy Abraham Kuyperstraat 6 8862 VS HARLINGEN
Customer no.	: 11492
Customer location*	: ToxicoWatch Consultancy

REPORT

Report code	: C6642578	Sampled by	: not by NGAC
Sample code	: U183240228571		
Date of receipt	: 28-2-2024		
Analysis start date	: 28-2-2024		
Report date	: 14-3-2024		

SAMPLE*

Description	: 23TWS-Mos-Vc01
Variety	: Mos

The results in the report apply to the investigated sample as received.

PAHs analysis	Results	Unit	Method
Acenaphthylene	<1,0	µg/kg	GC-MS/MS
Acenaphthene	<1,0	µg/kg	
Fluoren	<1,0	µg/kg	
Phenanthrene	9,0	µg/kg	
Anthracene	<1,0	µg/kg	
Fluoranthene	38,1	µg/kg	
Pyren	30,9	µg/kg	
Benzo(a)anthracene	13,2	µg/kg	
Chrysen	23,7	µg/kg	
Benzo(b)fluoranthene	30,9	µg/kg	
Benzo(k)fluoranthene	12,3	µg/kg	
Benzo(a)pyrene	20,4	µg/kg	
Dibenz(ah)anthracene	4,7	µg/kg	
Benzo(g,h,i)perylene	25,2	µg/kg	
Indeno(1,2,3cd)pyrene	22,5	µg/kg	
Sum Chr, B(b)f, B(a)p, B(a)a	88,2	µg/kg	

* information provided by customer

Disclaimer

The analysis on this sample have been outsourced.

General manager

ir. J. de Vriend

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Heavy metals

Pine needles 2 x

Mos 2 x

Analysecertificaat

Normec
Groen Agro Control

KLANT

Klantnaam	: ToxicoWatch Consultancy Abraham Kuyperstraat 6 8862 VS HARLINGEN
Klantnummer	: 11492
Klantlocatie*	: ToxicoWatch Consultancy

RAPPORT

Rapportnummer	: C6637488	Bemonsterd	: niet door NGAC
Monstercode	: EZB240226225		
Datum ontvangst	: 26-2-2024		
Startdatum analyse	: 27-2-2024		
Datum rapport	: 5-3-2024		
Gebruikte methoden	: ICP-MS zwaremetalen (A068+A095)		

MONSTER*

Omschrijving	: 23TWS-PN-HS02
Variëteit	: pine needles

De resultaten in het rapport zijn van toepassing op het onderzochte monster, zoals deze is ontvangen.

RESULTATEN

Methode	Component	Eenheid	Concen-tratie
ICP-MS zwaremetalen	Aluminium (Al)	mg/kg DS	99
ICP-MS zwaremetalen	Zilver (Ag)	mg/kg DS	< 0.01
ICP-MS zwaremetalen	Arseen (As)	mg/kg DS	0.066
ICP-MS zwaremetalen	Barium (Ba)	mg/kg DS	67
ICP-MS zwaremetalen	Cadmium (Cd)	mg/kg DS	< 0.01
ICP-MS zwaremetalen	Cobalt (Co)	mg/kg DS	0.061
ICP-MS zwaremetalen	Kwik (Hg)	mg/kg DS	0.026
ICP-MS zwaremetalen	Chroom (Cr)	mg/kg DS	0.28
ICP-MS zwaremetalen	Koper (Cu)	mg/kg DS	4.8
ICP-MS zwaremetalen	Nikkel (Ni)	mg/kg DS	0.28
ICP-MS zwaremetalen	Lood (Pb)	mg/kg DS	0.33
ICP-MS zwaremetalen	Tin (Sn)	mg/kg DS	0.040
ICP-MS zwaremetalen	Zink (Zn)	mg/kg DS	41

* informatie verkregen van de klant

'<': Element niet gedetecteerd boven de weergegeven aantoonbaarheidsgrens. M.O. = Meetonzekerheid.

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Analysecertificaat

Normec
Groen Agro Control

KLANT

Klantnaam	: ToxicoWatch Consultancy Abraham Kuyperstraat 6 8862 VS HARLINGEN
Klantnummer	: 11492
Klantlocatie*	: ToxicoWatch Consultancy

RAPPORT

Rapportnummer	: C6637781	Bemonsterd	: niet door NGAC
Monstercode	: EGT240226232	Type monster	: Gewas
Datum ontvangst	: 26-2-2024		
Startdatum analyse	: 27-2-2024		
Datum rapport	: 5-3-2024		
Gebruikte methoden	: ICP (A068+A094, eigen methode, analyse na destructie)		

MONSTER*

Omschrijving	: 23TWS-PN-HS02
Variëteit	: pine needles

De resultaten in het rapport zijn van toepassing op het onderzochte monster, zoals deze is ontvangen.

RESULTATEN

Methode	Parameter	Eenheid	Concentratie
ICP	Mangaan (Mn)	mg/kg DS	55.1

* informatie verkregen van de klant

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KLANT

Klantnaam	: ToxicoWatch Consultancy Abraham Kuyperstraat 6 8862 VS HARLINGEN
Klantnummer	: 11492
Klantlocatie*	: ToxicoWatch Consultancy

RAPPORT

Rapportnummer	: C6637489	Bemonsterd	: niet door NGAC
Monstercode	: EZB240226226		
Datum ontvangst	: 26-2-2024		
Startdatum analyse	: 27-2-2024		
Datum rapport	: 5-3-2024		
Gebruikte methoden	: ICP-MS zwaremetalen (A068+A095)		

MONSTER*

Omschrijving	: 23TWS-PN-VC02 DEN
Variëteit	: Mos

De resultaten in het rapport zijn van toepassing op het onderzochte monster, zoals deze is ontvangen.

RESULTATEN

Methode	Component	Eenheid	Concentratie
ICP-MS zwaremetalen	Aluminium (Al)	mg/kg DS	155
ICP-MS zwaremetalen	Zilver (Ag)	mg/kg DS	< 0.01
ICP-MS zwaremetalen	Arseen (As)	mg/kg DS	0.083
ICP-MS zwaremetalen	Barium (Ba)	mg/kg DS	61
ICP-MS zwaremetalen	Cadmium (Cd)	mg/kg DS	0.011
ICP-MS zwaremetalen	Cobalt (Co)	mg/kg DS	< 0.05
ICP-MS zwaremetalen	Kwik (Hg)	mg/kg DS	0.028
ICP-MS zwaremetalen	Chroom (Cr)	mg/kg DS	0.33
ICP-MS zwaremetalen	Koper (Cu)	mg/kg DS	3.1
ICP-MS zwaremetalen	Nikkel (Ni)	mg/kg DS	0.24
ICP-MS zwaremetalen	Lood (Pb)	mg/kg DS	0.41
ICP-MS zwaremetalen	Tin (Sn)	mg/kg DS	0.053
ICP-MS zwaremetalen	Zink (Zn)	mg/kg DS	36

* informatie verkregen van de klant

'<': Element niet gedetecteerd boven de weergegeven aantoonbaarheidsgrens. M.O. = Meetonzekerheid.

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Analysecertificaat

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KLANT

Klantnaam	:	ToxicoWatch Consultancy Abraham Kuyperstraat 6 8862 VS HARLINGEN
Klantnummer	:	11492
Klantlocatie*	:	ToxicoWatch Consultancy

RAPPORT

Rapportnummer	:	C6637786	Bemonsterd	: niet door NGAC
Monstercode	:	EGT240226238	Type monster	: Gewas
Datum ontvangst	:	26-2-2024		
Startdatum analyse	:	27-2-2024		
Datum rapport	:	5-3-2024		
Gebruikte methoden	:	ICP (A068+A094, eigen methode, analyse na destructie)		

MONSTER*

Omschrijving	:	23TWS-PN-VC02 DEN
Variëteit	:	eierschaal

De resultaten in het rapport zijn van toepassing op het onderzochte monster, zoals deze is ontvangen.

RESULTATEN

Methode	Parameter	Eenheid	Concentratie
ICP	Mangaan (Mn)	mg/kg DS	13.0

* informatie verkregen van de klant

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KLANT

Klantnaam	: ToxicoWatch Consultancy Abraham Kuyperstraat 6 8862 VS HARLINGEN
Klantnummer	: 11492
Klantlocatie*	: ToxicoWatch Consultancy

RAPPORT

Rapportnummer	: C6637491	Bemonsterd	: niet door NGAC
Monstercode	: EZB240226228		
Datum ontvangst	: 26-2-2024		
Startdatum analyse	: 27-2-2024		
Datum rapport	: 5-3-2024		
Gebruikte methoden	: ICP-MS zwaremetalen (A068+A095)		

MONSTER*

Omschrijving	: 23TWS-MOS-HS02
Variëteit	: Soil

De resultaten in het rapport zijn van toepassing op het onderzochte monster, zoals deze is ontvangen.

RESULTATEN

Methode	Component	Eenheid	Concen-tratie
ICP-MS zwaremetalen	Aluminium (Al)	mg/kg DS	8789
ICP-MS zwaremetalen	Zilver (Ag)	mg/kg DS	0.11
ICP-MS zwaremetalen	Arseen (As)	mg/kg DS	3.9
ICP-MS zwaremetalen	Barium (Ba)	mg/kg DS	141
ICP-MS zwaremetalen	Cadmium (Cd)	mg/kg DS	1.3
ICP-MS zwaremetalen	Cobalt (Co)	mg/kg DS	17
ICP-MS zwaremetalen	Kwik (Hg)	mg/kg DS	0.086
ICP-MS zwaremetalen	Chroom (Cr)	mg/kg DS	23
ICP-MS zwaremetalen	Koper (Cu)	mg/kg DS	26
ICP-MS zwaremetalen	Nikkel (Ni)	mg/kg DS	26
ICP-MS zwaremetalen	Lood (Pb)	mg/kg DS	47
ICP-MS zwaremetalen	Tin (Sn)	mg/kg DS	2.2
ICP-MS zwaremetalen	Zink (Zn)	mg/kg DS	135

* informatie verkregen van de klant
M.O. = Meetonzekerheid.

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Analysecertificaat

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KLANT

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Klantnummer	:	11492
Klantlocatie*	:	ToxicoWatch Consultancy

RAPPORT

Rapportnummer	:	C6637783	Bemonsterd	: niet door NGAC
Monstercode	:	EGT240226234	Type monster	: Gewas
Datum ontvangst	:	26-2-2024		
Startdatum analyse	:	27-2-2024		
Datum rapport	:	5-3-2024		
Gebruikte methoden	:	ICP (A068+A094, eigen methode, analyse na destructie)		

MONSTER*

Omschrijving	:	23TWS-MOS-HS02
Variëteit	:	Soil

De resultaten in het rapport zijn van toepassing op het onderzochte monster, zoals deze is ontvangen.

RESULTATEN

Methode	Parameter	Eenheid	Concentratie
ICP	Mangaan (Mn)	mg/kg DS	561

* informatie verkregen van de klant

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KLANT

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Klantnummer	: 11492
Klantlocatie*	: ToxicoWatch Consultancy

RAPPORT

Rapportnummer	: C6637490	Bemonsterd	: niet door NGAC
Monstercode	: EZB240226227		
Datum ontvangst	: 26-2-2024		
Startdatum analyse	: 27-2-2024		
Datum rapport	: 5-3-2024		
Gebruikte methoden	: ICP-MS zwaremetalen (A068+A095)		

MONSTER*

Omschrijving	: 23TWS-MOS-ZA01
Variëteit	: Fruit - Fig

De resultaten in het rapport zijn van toepassing op het onderzochte monster, zoals deze is ontvangen.

RESULTATEN

Methode	Component	Eenheid	Concen-tratie
ICP-MS zwaremetalen	Aluminium (Al)	mg/kg DS	14727
ICP-MS zwaremetalen	Zilver (Ag)	mg/kg DS	0.15
ICP-MS zwaremetalen	Arseen (As)	mg/kg DS	4.5
ICP-MS zwaremetalen	Barium (Ba)	mg/kg DS	216
ICP-MS zwaremetalen	Cadmium (Cd)	mg/kg DS	2.2
ICP-MS zwaremetalen	Cobalt (Co)	mg/kg DS	32
ICP-MS zwaremetalen	Kwik (Hg)	mg/kg DS	0.11
ICP-MS zwaremetalen	Chroom (Cr)	mg/kg DS	64
ICP-MS zwaremetalen	Koper (Cu)	mg/kg DS	22
ICP-MS zwaremetalen	Nikkel (Ni)	mg/kg DS	71
ICP-MS zwaremetalen	Lood (Pb)	mg/kg DS	76
ICP-MS zwaremetalen	Tin (Sn)	mg/kg DS	3.5
ICP-MS zwaremetalen	Zink (Zn)	mg/kg DS	6293

* informatie verkregen van de klant
M.O. = Meetonzekerheid.

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KLANT

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Klantnummer	: 11492
Klantlocatie*	: ToxicoWatch Consultancy

RAPPORT

Rapportnummer	: C6637782	Bemonsterd	: niet door NGAC
Monstercode	: EGT240226233	Type monster	: Gewas
Datum ontvangst	: 26-2-2024		
Startdatum analyse	: 27-2-2024		
Datum rapport	: 5-3-2024		
Gebruikte methoden	: ICP (A068+A094, eigen methode, analyse na destructie)		

MONSTER*

Omschrijving	: 23TWS-MOS-ZA01
Variëteit	: Fruit - Fig

De resultaten in het rapport zijn van toepassing op het onderzochte monster, zoals deze is ontvangen.

RESULTATEN

Methode	Parameter	Eenheid	Concentratie
ICP	Mangaan (Mn)	mg/kg DS	918

* informatie verkregen van de klant

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