


Annex I

SAMPLE Plan 2021 region Pilsen, Czech Republic


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Annex I

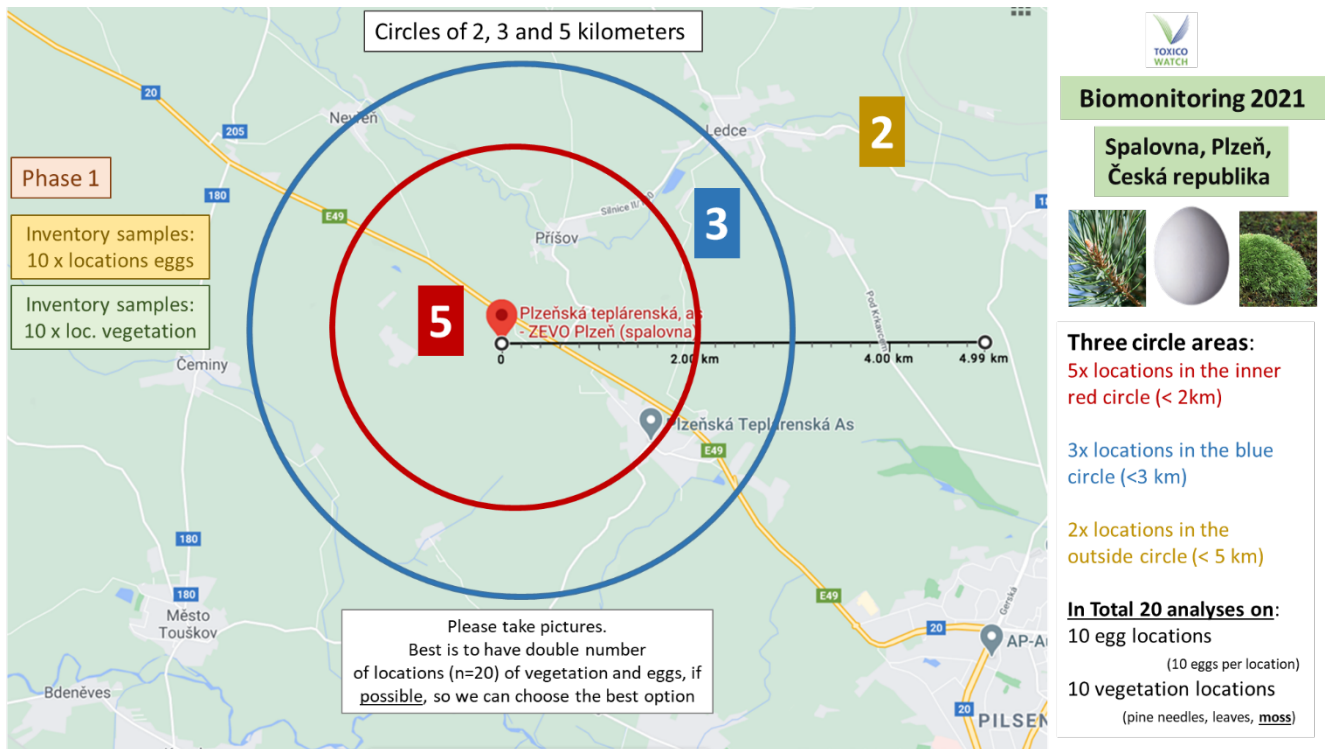
Biomonitoring
Research Pilsen
Czech Republic, 2021



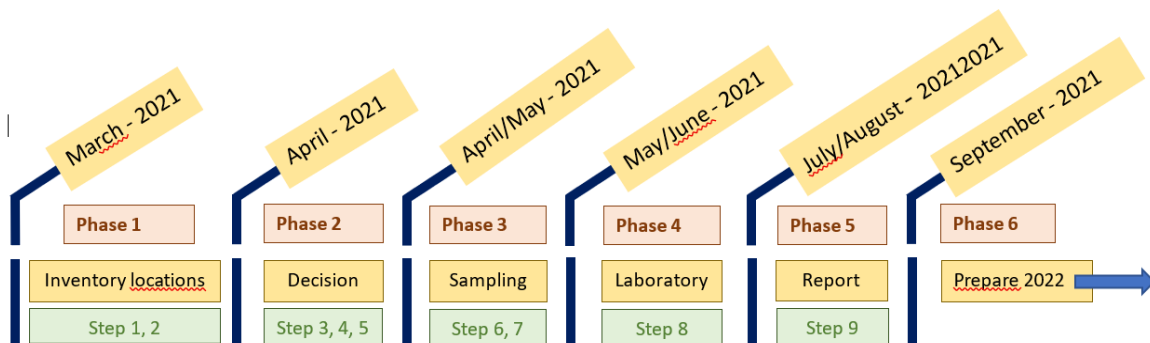
ZEVO Chotikov Incinerator
incineration



| TW Biomonitoring Eggs Backyard Chicken 2021 - Czech Rep. Plzeň | | |
|--|---|----------------------|
| Action | Action | 9 Steps EGG sampling |
| TW | CZ | |
| Phase 1 | | |
| Step 1 | Inventarisation of suitable Egg locations of backyard chicken < 2, < 3, < 5 km | |
| | 5x locations inner circle < 2 km, 3x locations <3 km, 2x locations outside circle < 5 km | |
| | Total: 10 selected vegetation samples | |
| | Please Provide TW Questionnaire Eggs of backyard Chicken to chicken coop owners and send it back to TW | |
| | Locations located IN the winddirection coming undisturbed from the waste incinerator | |
| | Locations at < 2km most wanted for research, at least 5 locations | |
| | Locations <3 km at least 3 locations | |
| | Locations outside circle < 5 km, at least 2 locations for reference research | |
| | TW will check by Google earth and other studies, data | |
| Step 2 | Check Chicken Coop owners willingness to Participate, Send back Questionnaire | |
| | Location visit chicken coop owners , please take pictures/photo's of chicken enclosures, fences, building material, like roofs, feed cribs, water containers with ordening of location nr. and coordinates of Egg, Feed, Soil samples | |
| | TW will assist you by mobile phone/video if needed directly on location | |
| | <2 km (5x vegetation locations needed for analyses, if possible 10x locations so we can choose) | |
| | Photo's/pictures needed to be made of: | |
| | 1. the whole area chicken coop | |
| | 2. enclosure fences | |
| | 3. building material chicken enclosure, like roofs, Henhouse, chicken brood boxes | |
| | 4. feed cribs, water container suppliers | |
| | 5. the chicken coop itself | |
| | SEND BACK the TW Questionnaire for Biomonitoring backyard Chicken Eggs | |
| | < 3 km (3x vegetation locations, if possible 6 x locations so TW can choose) | |
| | 3- 5 km (2x vegetation locations, if possible 4 x locations so TW can choose) | |
| Phase 2 | | |
| Step 3 | Sending all pictures/photo material to ToxicoWatch for study | |
| | with ordening of location+ photo nr. and coordinates of possible egg locations, if needed with TW assistance | |
| | TW will study on all the send photo material of Egg locations together with received questionnaires of Egg locations. | |
| | After studying this photo input, TW will select the best Egg locations options to use for sampling | |
| Step 4 | Review with CZ Team about possibilities of sampling by TW selected | |
| | Egg locations <2,<3, and <5 km (ideal 10 locations), 10 Egg samples/location! | |
| | 5x locations inner circle < 2 km, 3x locations <3 km, 2x locations outside circle < 5 km | |
| | Discussion of the selected Egg locations to make definitive selection of sample locations | |
| Step 5 | TW Providing Reference lab sample Nr (TW-REF-NR) for Egg samples | |
| | TW provides after studying the photomaterial of the Egg locations TW-REF-NR | |
| | i.e. TW-LT21-Egg-L01 | |
| | The TW-REF-NR is important for the Lab analyses needed to be handled/documentated very strictly | |
| Phase 3 | | |
| Step 6 | Second visit to selected vegetation locations for COLLECTING SAMPLES | |
| | Collecting the eggs (10 per location) at the selected Egg locations as discussed in Review, step 4. | |
| | The collecting of the Eggs needed AGAIN covered by pictures/video and documented/numbered | |
| | TW assisting by video and mobile during collecting samples | |
| | The photo material needs to be documented with numbers and data, (see Step 2) | |
| | Collected samples needed directly marked with a TW Reference/laboratorium number. | |
| | TW assist if needed by mobile/video connection | |
| | Collected Eggs needed to be stored as prescribed (dry, dark and cool) till shipping to NL | |
| Step 7 | Send/shipping all the collected Egg samples to TW as prescribed | |
| | Shipping of the collected Egg samples to the address of Laboratory | |
| | Please take photo of packed Egg sample before shipping to Lab | |
| | TW will provide prescription for sending/shipping | |
| Phase 4 | | |
| Step 8 | Handling by TW of all the received Egg samples at the Lab | |
| | TW Checking all the received Egg samples on, TW/lab nr/ grams | |
| | with the photo/video material and other data | |
| | Providing the collected samples to the lab with instructions for analyses | |
| | TW: Proposal discussions with Lab: analyse plan for this collected biomarkers | |
| Phase 5 | | |
| Step 9 | Lab Analyses results Egg samples, TW Report LT/Kaunas Biomonitoring 2021 | |
| | TW Studying, working out report CZ 21 | |
| | TW finalising research Report CZ Biomonitoring 2021 | |
| Phase 6 | | |
| | Prepare Biomonitoring Czech Rep., Plzeň 2022 on base of the results 2021 | |



The initial biomonitoring sample timeline plan:



| | | Biomonitoring Vegetation 2021 - Czech Rep. Plzeň | |
|----------------|--------|--|----------|
| | | Pine needles & Mosses | |
| Action | Action | 9 Steps Vegetation sampling | |
| TW | CZ | | |
| Phase 1 | | | |
| Step 1 | | Inventarisation of available common vegetation species | L |
| | | Please check if the vegetation (pine trees: <i>Picea abies</i> , <i>Pinus sylvestris</i> and mosses) can be found in the area around the incinerator. | |
| | | 5x locations inner circle < 2 km, 3x locations <3 km, 2x locations outside circle < 5 km | |
| | | Total: 10 selected vegetation samples | |
| | | TW will check availability of vegetation by Google maps/earth and other studies, data | |
| Step 2 | | Team CZ Check availability vegetation in the field circle: <2 km , <3km, <5km | |
| | | Location visit, making pictures/photo's with ordering of location nr. and coordinates of vegetation samples | |
| | | TW will assist you by mobile phone/video if needed directly on location | |
| | | Please select vegetation which is easy accessible and approachable, within: | |
| | | < 2 km (5x vegetation locations needed for analyses , if possible 10x locations so we can choose) | |
| | | < 3 km (3x vegetation locations, if possible 6 x locations so we can choose) | |
| | | 3- 5 km (2x vegetation locations, if possible 4 x locations so we can choose) | |
| | | Photo's/pictures needed to be made of: | |
| | | 1. the whole tree/shrub/plant in the environment | |
| | | 2. Close-up from the canopy of the tree | |
| | | 3. Close-up from the pine needles / Mosses | |
| | | 4. Close-up from the bark | |
| | | 5. Extra pictures i.e. leaves, flowers, soil, cones | |
| | | Use not only the youngest needles on a twig | |
| | | accessible: meaning it is physically possible to enter the needles on the twigs of a tree | |
| | | The trees need to be accessible for collecting the needles mosses + marking the wind direction. | |
| Phase 2 | | | |
| Step 3 | | Sending all pictures/photo material to ToxicoWatch | |
| | | with ordering of location+ photo nr. and coordinates of potential vegetation samples, if needed with TW assistance | |
| | | TW will identify the tree species and study on all the send photo material of vegetation. | |
| | | After studying this photo input, TW will select the best vegetation sample options to use for biomonitoring 2021 | |
| Step 4 | | Review with CZ Team about TW Decision of selected vegetation samples | |
| | | Discussion of the selected vegetation locations to make definitive selection of locations for biomonitoring | |
| Step 5 | | TW Providing TW-Reference-lab (TW-REF-NR) sample numbers | |
| | | TW provides after studying the photomaterial of the vegetation TW-REF-NR related to A. the location, B. The date of collecting, C. vegetation species and D. wind direction | |
| | | The TW-REF-NR is important for the Lab analyses and therefore, needed to be handled/documentated very strictly | |
| Phase 3 | | | |
| Step 6 | | Second visit to selected vegetation locations for COLLECTING SAMPLES | |
| | | Collecting the selected vegetation samples as discussed in Review, step 4. | |
| | | the collecting of the samples needed AGAIN covered by pictures/video and documented/numbered | |
| | | TW will assist you by video and mobile during collecting samples | |
| | | The photo material needs to be documented with numbers and data | |
| | | Samples needed marked by a TW-REF-NR/laboratorium number. | |
| | | TW will assist you with this as much as possible | |
| | | Collected samples needed stored as prescribed (dry, dark and cool) till shipping to NL | |
| Step 7 | | Sending/shipping all the collected vegetation samples to TW as prescribed | |
| | | Shipping of the collected vegetation samples to NL/TW | |
| | | as prescribed, TW will provide prescription for sending/shipping | |
| Phase 4 | | | |
| Step 8 | | Handling by TW of the received vegetation samples | |
| | | Checking all the received vegetation samples on species, TW/lab nr/ grams with the photo/video material and other data | |
| | | Providing the collected samples to the lab with instructions for analyses | |
| | | TW: Proposal discussions with Lab: analyse plan for this collected biomarkers | |
| Phase 5 | | | |
| Step 9 | | Analyse results vegetation samples, TW Report Biomonitoring CZ 2021 | |
| | | TW: Analyse results, studying and work out Report Biomonitoring CZ 2021 | |
| Phase 6 | | | |
| | | Prepare Biomonitoring 2022 on base of the results 2021 | |

Annex II

Egg locations region Pilsen, Czech Republic 2021

Dioxins (PCDD/F/dl-PCB), PAH, PFAS emissions

Biomonitoring
Research Pilsen
Czech Republic, 2021

Eggs
Backyard chicken



ZEVO Chotikov Incinerator
incineration



Biomonitoring
Research Pilsen
Czech Republic, 2021

Eggs

Backyard chicken

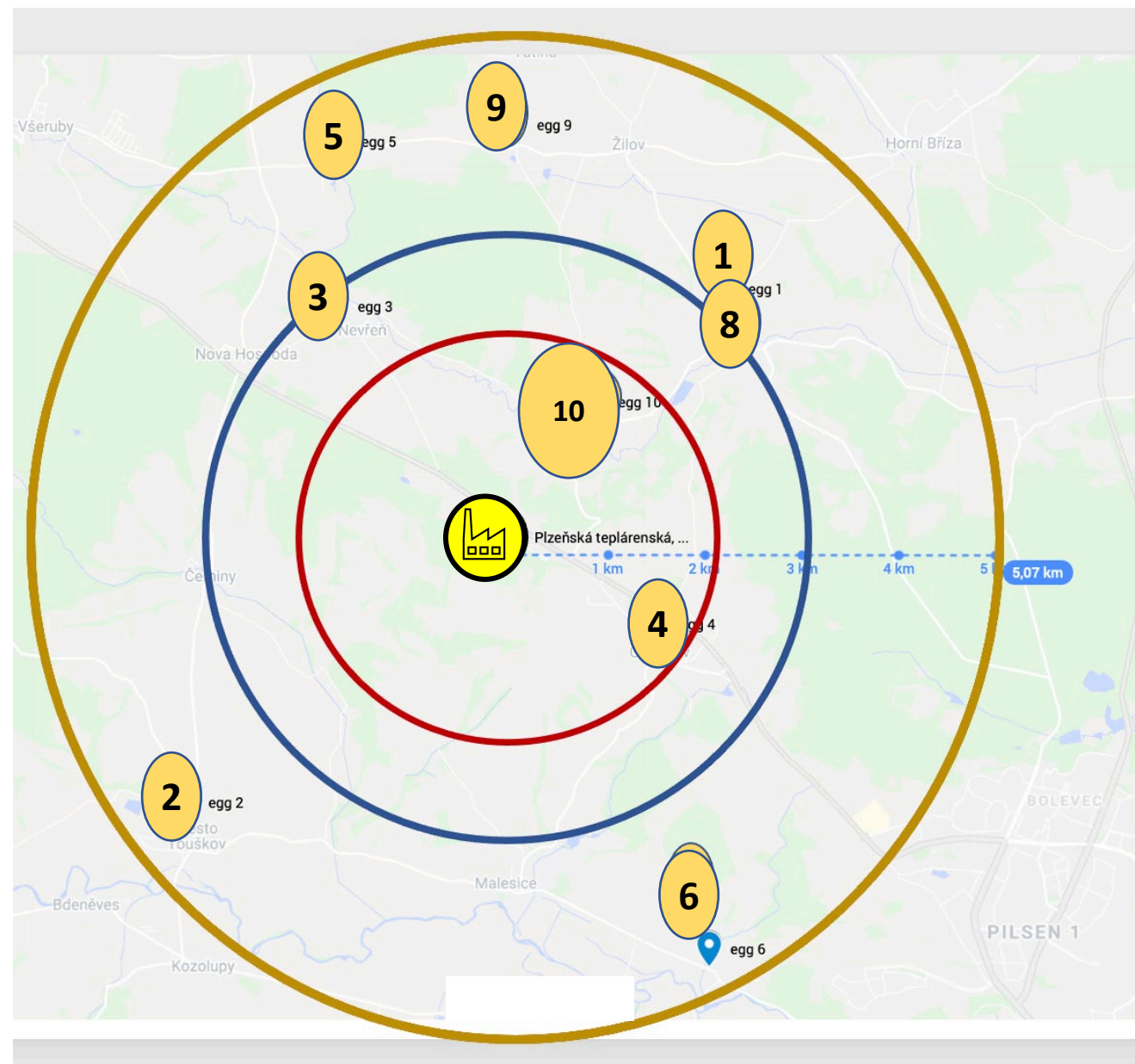


ZEVO Chotikov Incinerator
incineration



Sample locations eggs chicken eggs, Pilsen Czech 2021

| Eggs Czech Rep. | | |
|-----------------|---------------|--------------|
| Location | TW-REF-NR | Distance (m) |
| EGG01 | TW-CZ21-Egg01 | 3250 |
| EGG02 | TW-CZ21-Egg02 | 4290 |
| EGG03 | TW-CZ21-Egg03 | 3000 |
| EGG04 | TW-CZ21-Egg04 | 1780 |
| EGG05 | TW-CZ21-Egg05 | 4400 |
| EGG06 | TW-CZ21-Egg06 | 4700 |
| EGG07 | TW-CZ21-Egg07 | reference |
| EGG08 | TW-CZ21-Egg08 | 3170 |
| EGG09 | TW-CZ21-Egg09 | 4240 |
| EGG10 | TW-CZ21-Egg10 | 1630 |



Chemical analysis (GC-MS) vs Bioassay (CALUX)

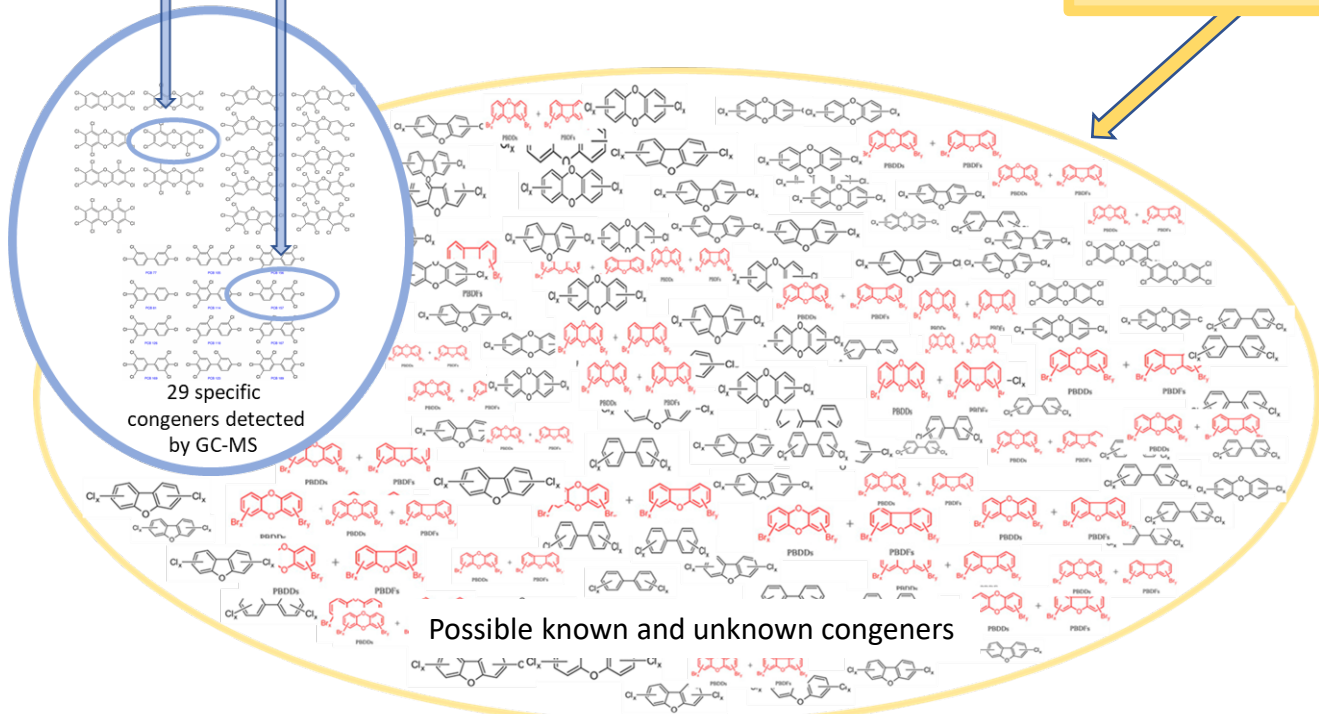
Halogen elements:

Chlorine (Cl)
Bromine (Br)
Fluorine (F)
Iodine (I)



GC-MS individual chemical analyses

DR CALUX, analyses of the whole group of dioxin-like activity



Chlorine can be substituted by an other halogen in dioxins, UPOP

| TW Indicative scale for Non-food DR CALUX | |
|---|-----------------------|
| > 5.0 | pg TCDD eq./g product |
| > 2.0 | pg TCDD eq./g product |
| 1.0 - 2.0 | pg TCDD eq./g product |
| 0.5 - 1.0 | pg TCDD eq./g product |
| < 0.5 | pg TCDD eq./g product |

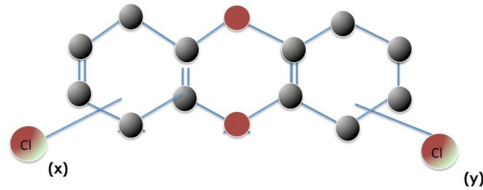
| DR CALUX Food (Eggs) | |
|----------------------|--------------------------------|
| pg BEQ / g fat | |
| ≥ 1.7 | EU Cut-off-Value PCDD/F |
| ≥ 3.3 | EU Cut-off-Value PCDD/F/dl-PCB |

GC-MS chlorinated dioxins (PCDD/F/dl-PCB)

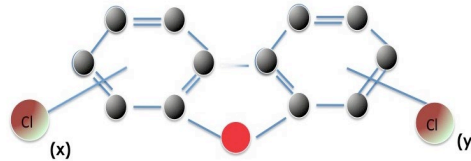
Halogen elements:

Chlorine (Cl)
Bromine (Br)
Fluorine (F)
Iodine (I)

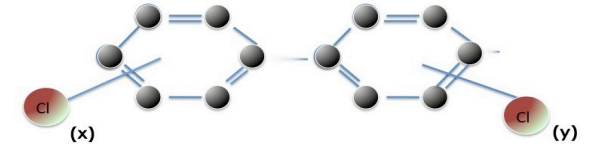
Dioxin
PCDD (75)
n = 7



Furan
PCDF (135)
n = 10



dioxin-like Polychlorinated biphenyl
dl-PCB (209)
n = 12



Congeners of chlorinated compounds (chemical GC-MS analysis)

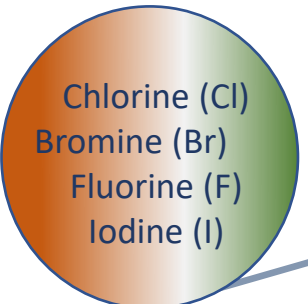
| Dioxins, furans (PCDD/F) and dioxin-like PCBs | | |
|---|---|--------|
| Abbreviation | Congeners | TEF |
| Dioxins (n=7) | | |
| TCDD | 2,3,7,8-Tetrachlorodibenzo-p-dioxin | 1 |
| PCDD | 1,2,3,7,8-Pentachlorodibenzo-p-dioxin | 1 |
| HxCDD1 | 1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin | 0,1 |
| HxCDD2 | 1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin | 0,1 |
| HxCDD3 | 1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin | 0,1 |
| HpCDD | 1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin | 0,01 |
| OCDD | Octachlorodibenzo-p-dioxin | 0,0003 |

| Furans (n=10) | | |
|----------------------|---------------------------------------|--------|
| TCDF | 2,3,7,8-Tetrachlorodibenzofuran | 0,1 |
| PCDF1 | 1,2,3,7,8-Pentachlorodibenzofuran | 0,03 |
| PCDF2 | 2,3,4,7,8-Pentachlorodibenzofuran | 0,3 |
| HxCDF1 | 1,2,3,4,7,8-Hexachlorodibenzofuran | 0,1 |
| HxCDF2 | 1,2,3,6,7,8-Hexachlorodibenzofuran | 0,1 |
| HxCDF3 | 1,2,3,7,8,9-Hexachlorodibenzofuran | 0,1 |
| HxCDF4 | 2,3,4,6,7,8-Hexachlorodibenzofuran | 0,1 |
| HPCDF1 | 1,2,3,4,6,7,8-Heptachlorodibenzofuran | 0,01 |
| HPCDF2 | 1,2,3,4,7,8,9-Heptachlorodibenzofuran | 0,01 |
| OCDF | Octachlorodibenzofuran | 0,0003 |

| Polychlorinated biphenyl (n=12) | | |
|--|---|---------|
| PCB77 | 3,3',4,4'-Tetrachlorobiphenyl (#77) | 0,0001 |
| PCB81 | 3,4,4',5-Tetrachlorobiphenyl (#81) | 0,0003 |
| PCB126 | 3,3',4,4',5-Pentachlorobiphenyl (#126) | 0,1 |
| PCB169 | 3,3',4,4',5,5'-Hexachlorobiphenyl (#169) | 0,03 |
| PCB105 | 2,3,3',4,4'-Pentachlorobiphenyl (#105) | 0,00003 |
| PCB114 | 2,3,4,4',5-Pentachlorobiphenyl (#114) | 0,00003 |
| PCB118 | 2,3',4,4',5-Pentachlorobiphenyl (#118) | 0,00003 |
| PCB123 | 2,3,4,4',5-Pentachlorobiphenyl (#123) | 0,00003 |
| PCB156 | 2,3,3',4,4',5-Hexachlorobiphenyl (#156) | 0,00003 |
| PCB157 | 2,3,3',4,4',5'-Hexachlorobiphenyl (#157) | 0,00003 |
| PCB167 | 2,3',4,4',5,5'-Hexachlorobiphenyl (#167) | 0,00003 |
| PCB189 | 2,3,3',4,4',5,5'-Heptachlorobiphenyl (#189) | 0,00003 |

EU regulations for (sum of)dioxins (PCDD/F/dl-PCB)

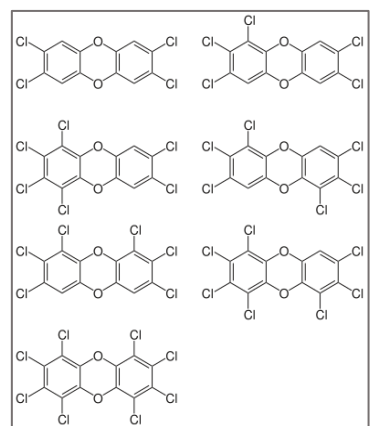
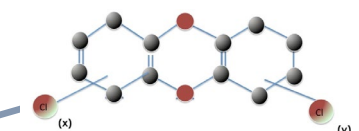
Halogen elements:



Chlorine can be substituted by an other halogen in dioxins, UPOP

EU Regulated only the chlorinated sum of dioxins (PCDD/F/dl-PCB) for food and only dioxins (PCDD/F) in emissions

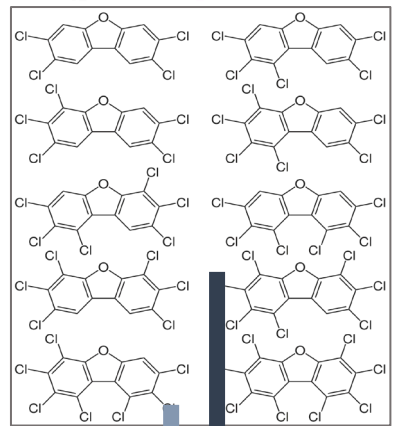
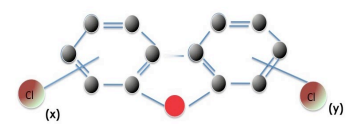
Dioxin
PCDD (75)
n = 7



0.1 ng TEQ/Nm3

| Food (Eggs) | GC-MS | pg TEQ/g fat |
|------------------|------------------------|-----------------|
| Non-food | GC-MS | pgTEQ/g product |
| > 2.5 | EU Limit PCDD/F | |
| > 1.75 | EU Action level PCDD/F | |

Furan
PCDF (135)
n = 10

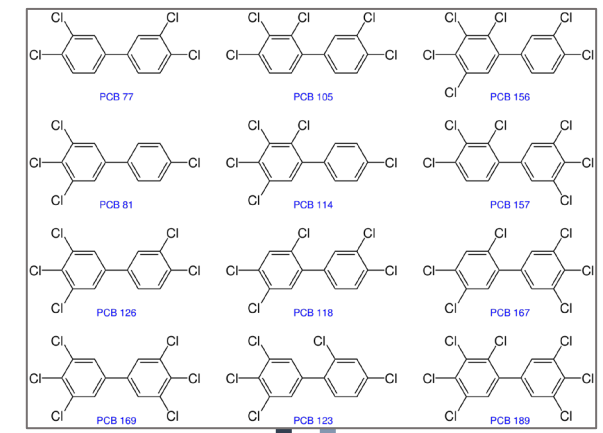
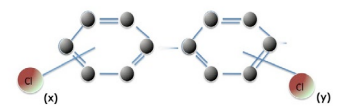


0.1 ng TEQ/Nm3

| Food (Eggs) | GC-MS | pg TEQ/g fat |
|-----------------|------------------------|-----------------|
| Non-food | GC-MS | pgTEQ/g product |
| > 5.0 | EU Limit PCDD/F/dl-PCB | |

| Food (Eggs) | GC-MS | pg TEQ/g fat |
|------------------|------------------------|-----------------|
| Non-food | GC-MS | pgTEQ/g product |
| > 2.5 | EU Limit PCDD/F | |
| > 1.75 | EU Action level PCDD/F | |

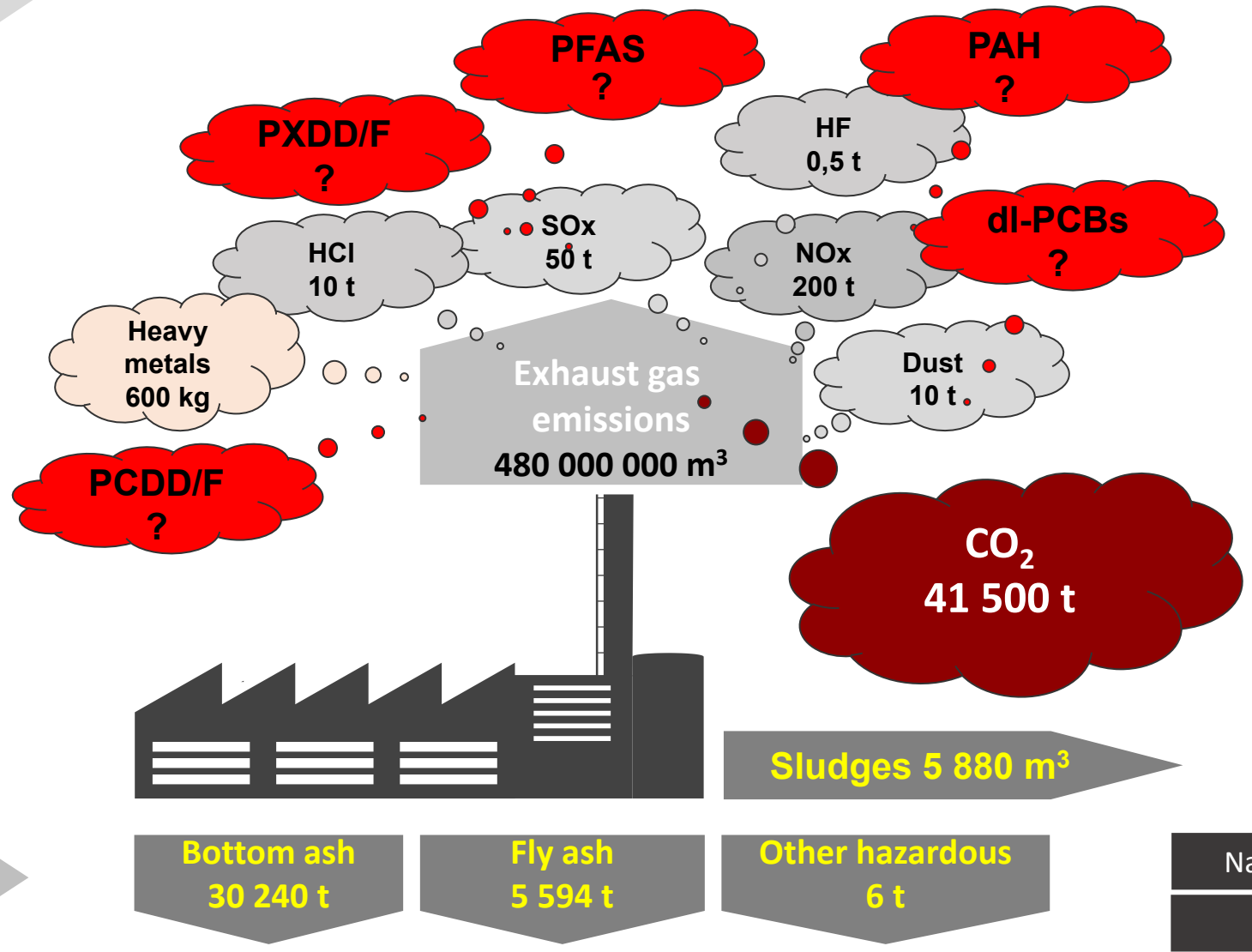
dioxin-like Polychlorinated biphenyl
dl-PCB (209)
n = 12



| Food (Eggs) | GC-MS | pg TEQ/g fat |
|------------------|------------------------|-----------------|
| Non-food | GC-MS | pgTEQ/g product |
| > 1.75 | EU Action level dl-PCB | |

What are the real emissions & residues of a modern waste (WtE) incineration plant ?

Does the emissions of waste incineration comply with EU emission standard ?

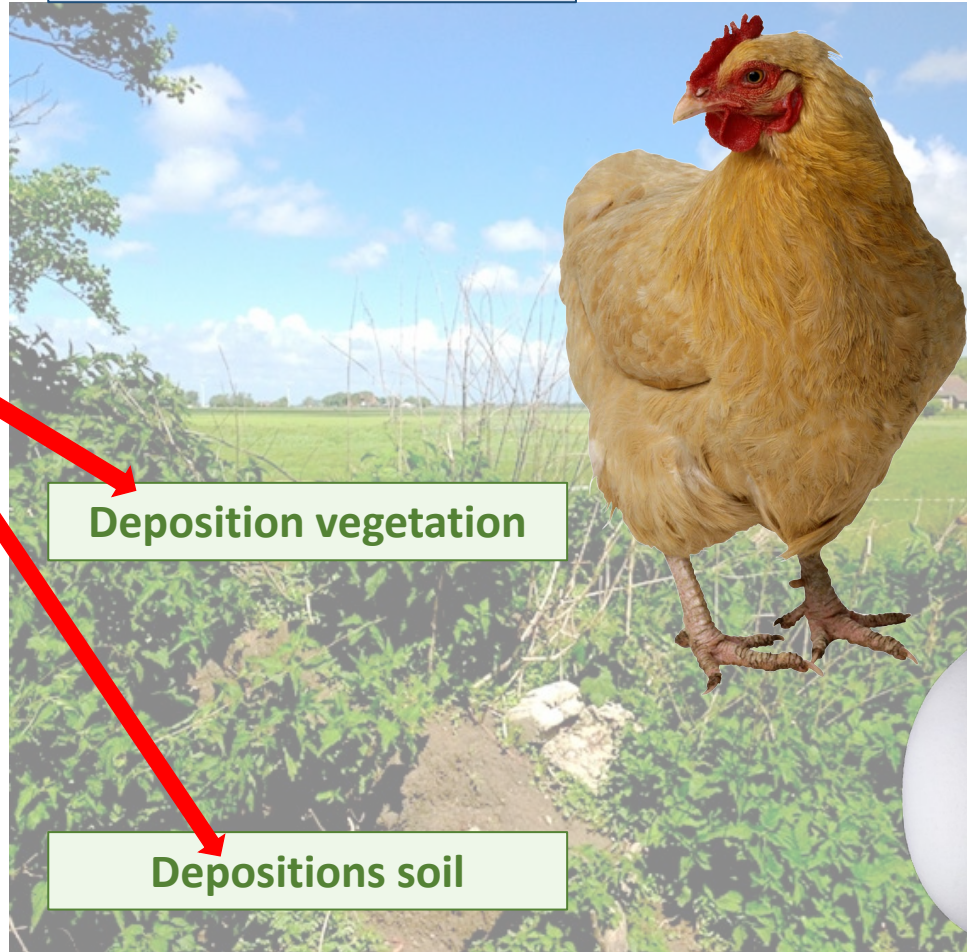


Why use eggs of backyard chicken for biomonitoring?

WtE incineration
Emissions SVHC



Air emissions



Deposition vegetation

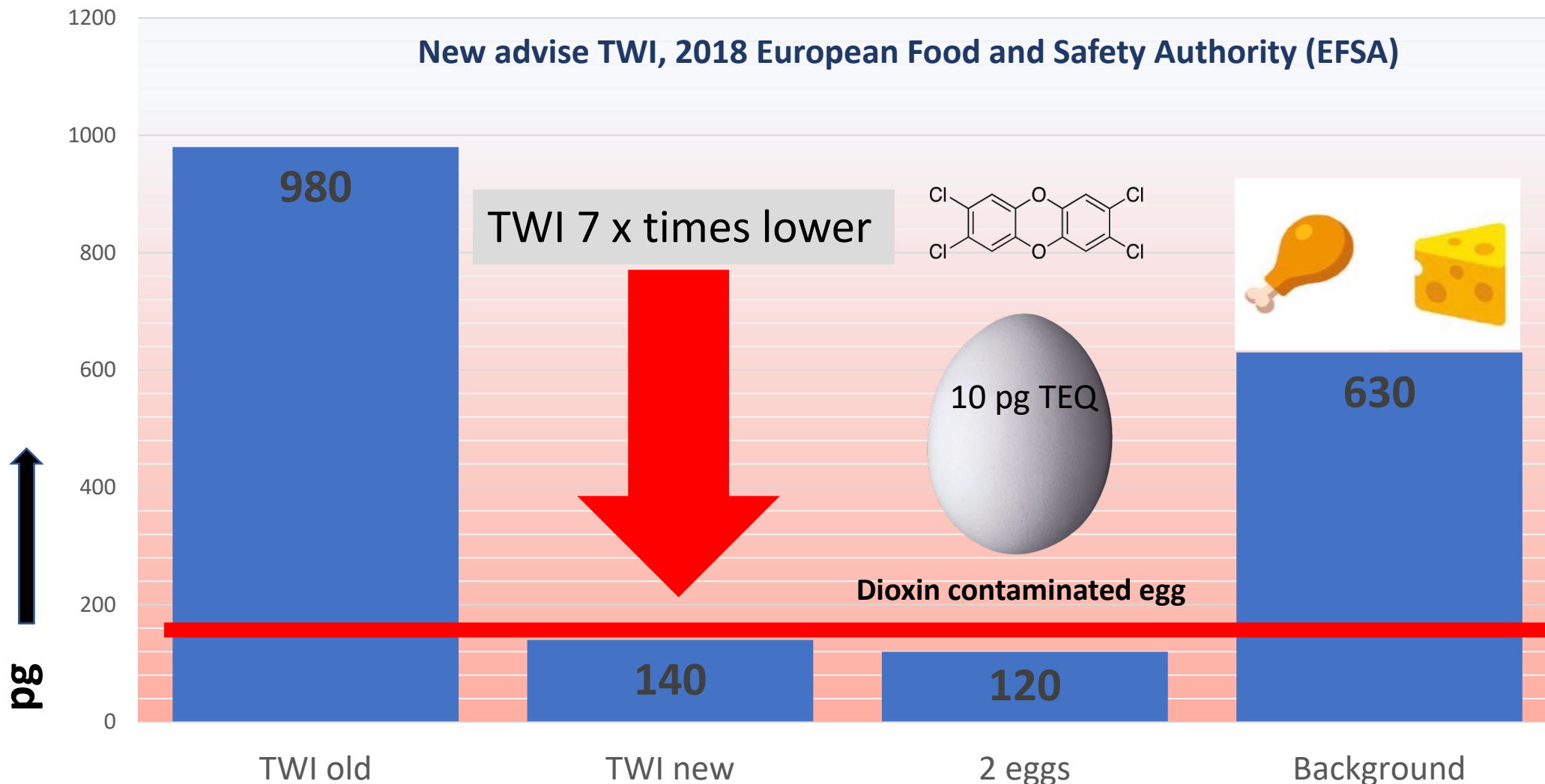
Depositions soil



Bioaccumulation
Biomagnification
Biotransformation
Xenobiotical metabolism

EFSA advise: Tolerable Weekly Intake (TWI) dioxins

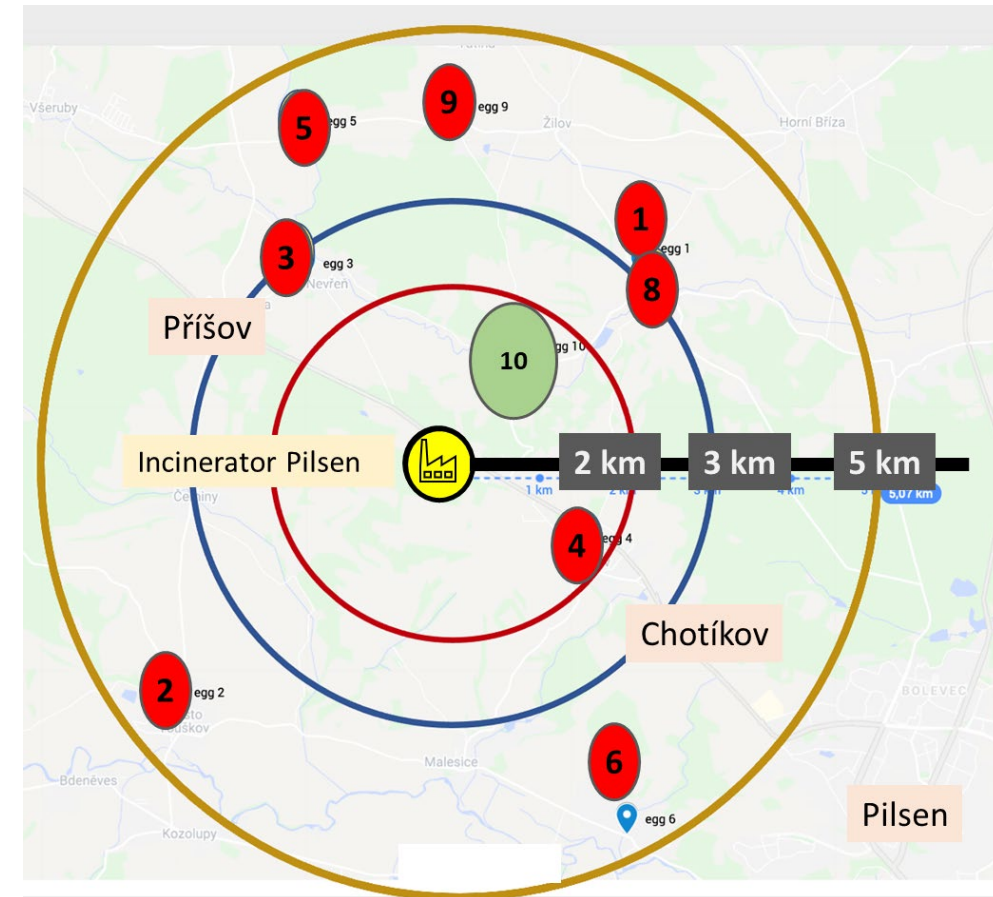
■ Person 70 kg



Red line: New TWI EFSA : 2 pg TEQ/kg bodyweight/ PER WEEK (old: 2 pg/day)

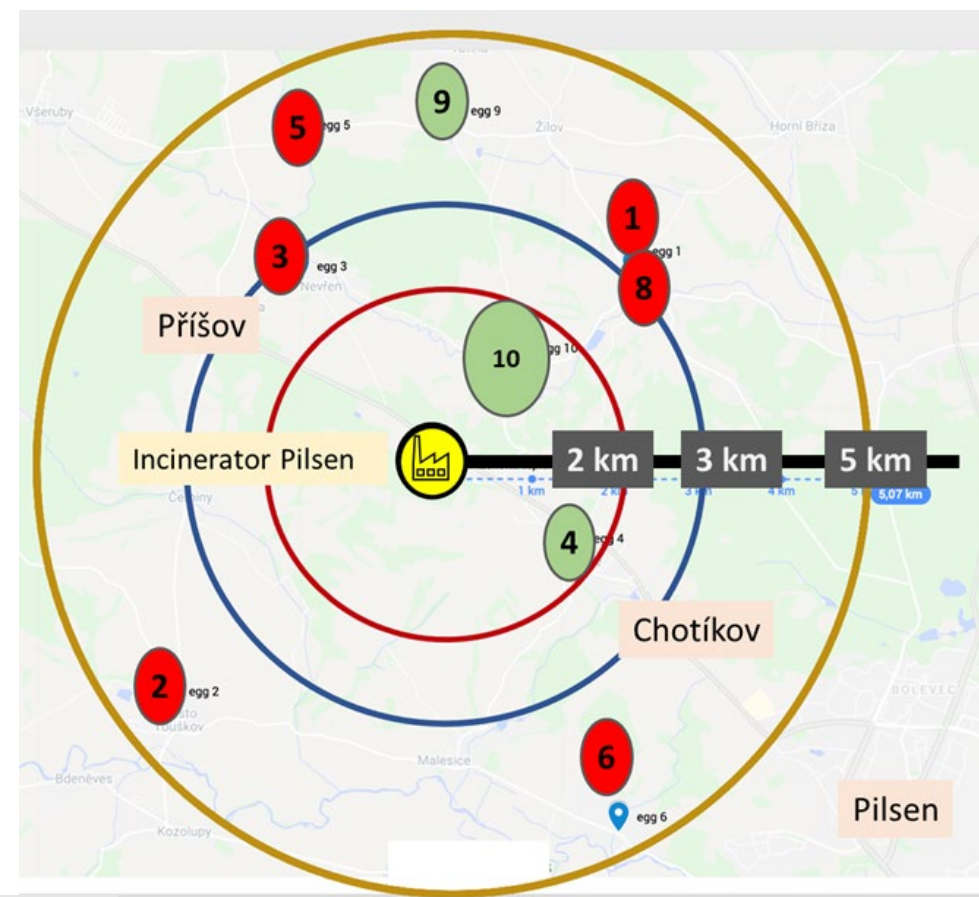
Results sum of dioxins (PCDD/F/dl-PCB) eggs Pilsen - 2021

| Eggs Czech Rep. | | Results eggs Pilsen, Czech Rep. - 2021 | | | | |
|-----------------|----------|--|-----------------|-------------------------------------|-------------|--------|
| Sample Date | Location | TW-REF-NR | Distance (m) | PCDD/F/dl-PCB | PCDD/F | dl-PCB |
| | | | | DR CALUX <i>pg BEQ/g fat</i> | | |
| 28-7-2021 | EGG01 | TW-CZ21-Egg-01 | 3250 | 3.80 | 2.10 | 1.70 |
| 28-7-2021 | EGG02 | TW-CZ21-Egg-02 | 4290 | 20.00 | 10.00 | 10.00 |
| 28-7-2021 | EGG03 | TW-CZ21-Egg-03 | 3000 | 4.30 | 1.70 | 2.60 |
| 28-7-2021 | EGG04 | TW-CZ21-Egg-04 | 1780 | 3.30 | 1.30 | 2.00 |
| 28-7-2021 | EGG05 | TW-CZ21-Egg-05 | 4400 | 18.00 | 11.00 | 7.00 |
| 28-7-2021 | EGG06 | TW-CZ21-Egg-06 | 4700 | 7.80 | 2.50 | 5.30 |
| 28-7-2021 | EGG07 | TW-CZ21-Egg-07 | reference | 0.71 | 0.30 | 0.41 |
| 28-7-2021 | EGG08 | TW-CZ21-Egg-08 | 3170 | 9.80 | 2.10 | 7.70 |
| 28-7-2021 | EGG09 | TW-CZ21-Egg-09 | 4240 | 3.40 | 0.66 | 2.74 |
| 28-7-2021 | EGG10 | TW-CZ21-Egg-10 | 1630 | 0.95 | 0.41 | 0.54 |
| | | Cut-off | DR CALUX | 3.30 | 1.70 | |



Results dioxins DR CALUX (PCDD/F) eggs Pilsen - 2021

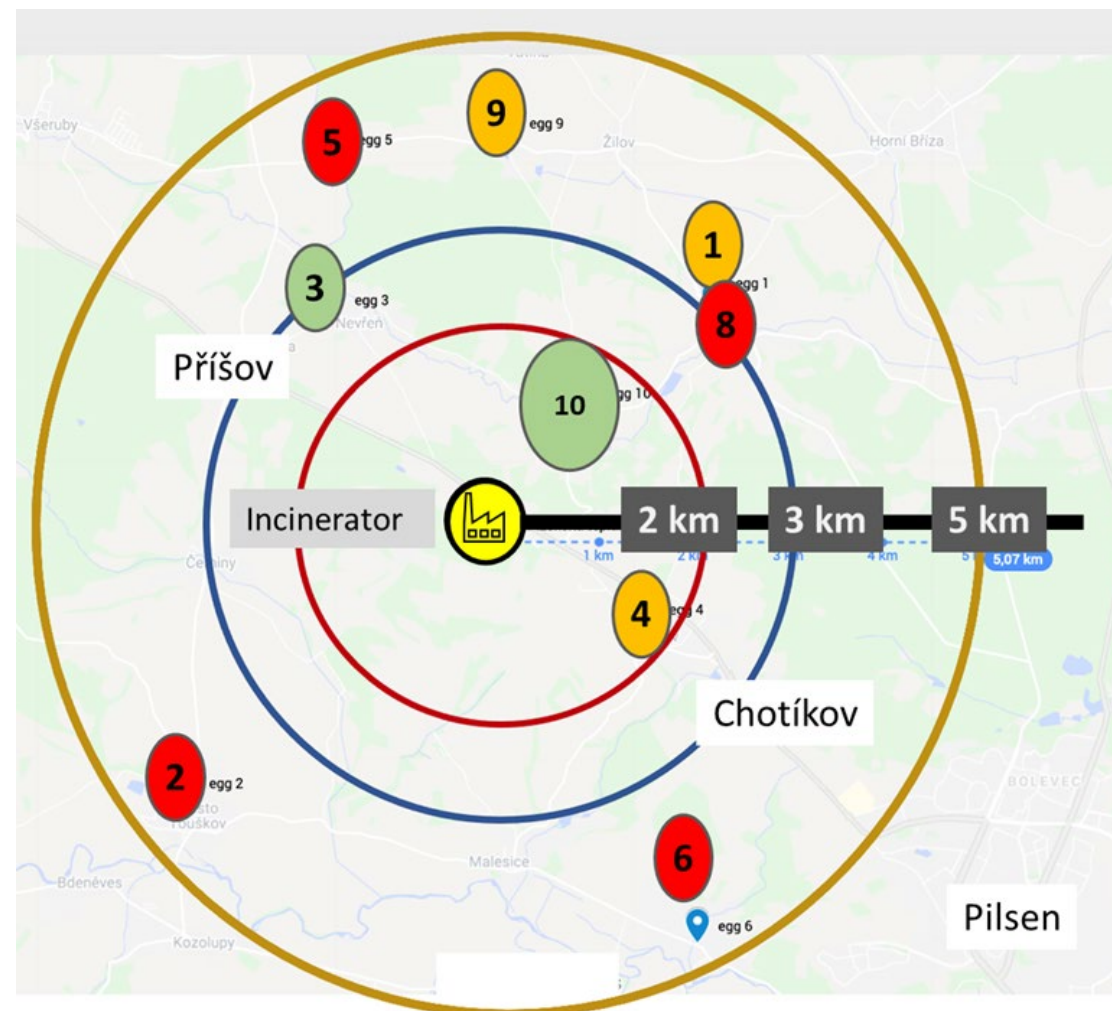
| Eggs Czech Rep. | | Results eggs Pilsen, Czech Rep. - 2021 | | | | |
|-----------------|----------|--|-----------------|-------------------------------------|--------------|--------------|
| Sample Date | Location | TW-REF-NR | Distance (m) | PCDD/F/dl-PCB | PCDD/F | dl-PCB |
| | | | | DR CALUX <i>pg BEQ/g fat</i> | | |
| 28-7-2021 | EGG01 | TW-CZ21-Egg-01 | 3250 | 3.80 | 2.10 | 1.70 |
| 28-7-2021 | EGG02 | TW-CZ21-Egg-02 | 4290 | 20.00 | 10.00 | 10.00 |
| 28-7-2021 | EGG03 | TW-CZ21-Egg-03 | 3000 | 4.30 | 1.70 | 2.60 |
| 28-7-2021 | EGG04 | TW-CZ21-Egg-04 | 1780 | 3.30 | 1.30 | 2.00 |
| 28-7-2021 | EGG05 | TW-CZ21-Egg-05 | 4400 | 18.00 | 11.00 | 7.00 |
| 28-7-2021 | EGG06 | TW-CZ21-Egg-06 | 4700 | 7.80 | 2.50 | 5.30 |
| 28-7-2021 | EGG07 | TW-CZ21-Egg-07 | reference | 0.71 | 0.30 | 0.41 |
| 28-7-2021 | EGG08 | TW-CZ21-Egg-08 | 3170 | 9.80 | 2.10 | 7.70 |
| 28-7-2021 | EGG09 | TW-CZ21-Egg-09 | 4240 | 3.40 | 0.66 | 2.74 |
| 28-7-2021 | EGG10 | TW-CZ21-Egg-10 | 1630 | 0.95 | 0.41 | 0.54 |
| | | Cut-off | DR CALUX | 3.30 | 1.70 | |



Results GC-MS sum of dioxins (PCDD/F/dl-PCB) eggs Pilsen - 2021

| Eggs Pilsen, Czech Republic - 2021 | | | | | |
|------------------------------------|---------------------|--------------|---------------------------|-------------|-------------|
| Location | TW-REF-NR | Distance (m) | PCDD/F/dl-PCB | PCDD/F | dl-PCB |
| | | | GC-MS <i>pg TEQ/g fat</i> | | |
| EGG01 | TW-CZ21-Egg01 | 3250 | 3.60 | 2.20 | 1.40 |
| EGG02 | TW-CZ21-Egg02 | 4290 | 22.00 | 6.70 | 16.00 |
| EGG03 | TW-CZ21-Egg03 | 3000 | 2.20 | 1.00 | 1.20 |
| EGG04 | TW-CZ21-Egg04 | 1780 | 4.00 | 0.95 | 3.00 |
| EGG05 | TW-CZ21-Egg05 | 4400 | 14.00 | 8.90 | 5.00 |
| EGG06 | TW-CZ21-Egg06 | 4700 | 9.20 | 1.70 | 7.40 |
| EGG07 | TW-CZ21-Egg07 | reference | 0.69 | 0.63 | 0.06 |
| EGG08 | TW-CZ21-Egg08 | 3170 | 9.70 | 1.30 | 8.40 |
| EGG09 | TW-CZ21-Egg09 | 4240 | 3.50 | 0.74 | 2.80 |
| EGG10 | TW-CZ21-Egg10 | 1630 | NA | NA | NA |
| | Cut-off | GC-MS | 5.00 | 2.50 | |
| | Action limit | GC-MS | | 1.75 | 1.75 |

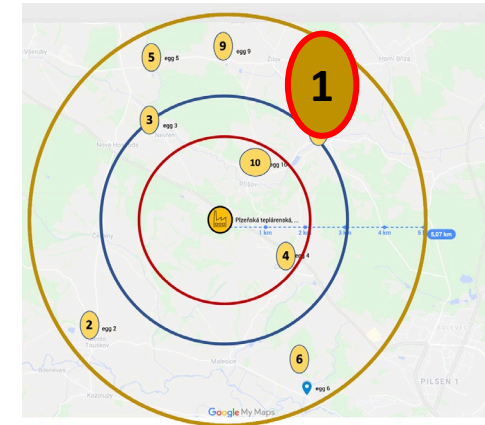
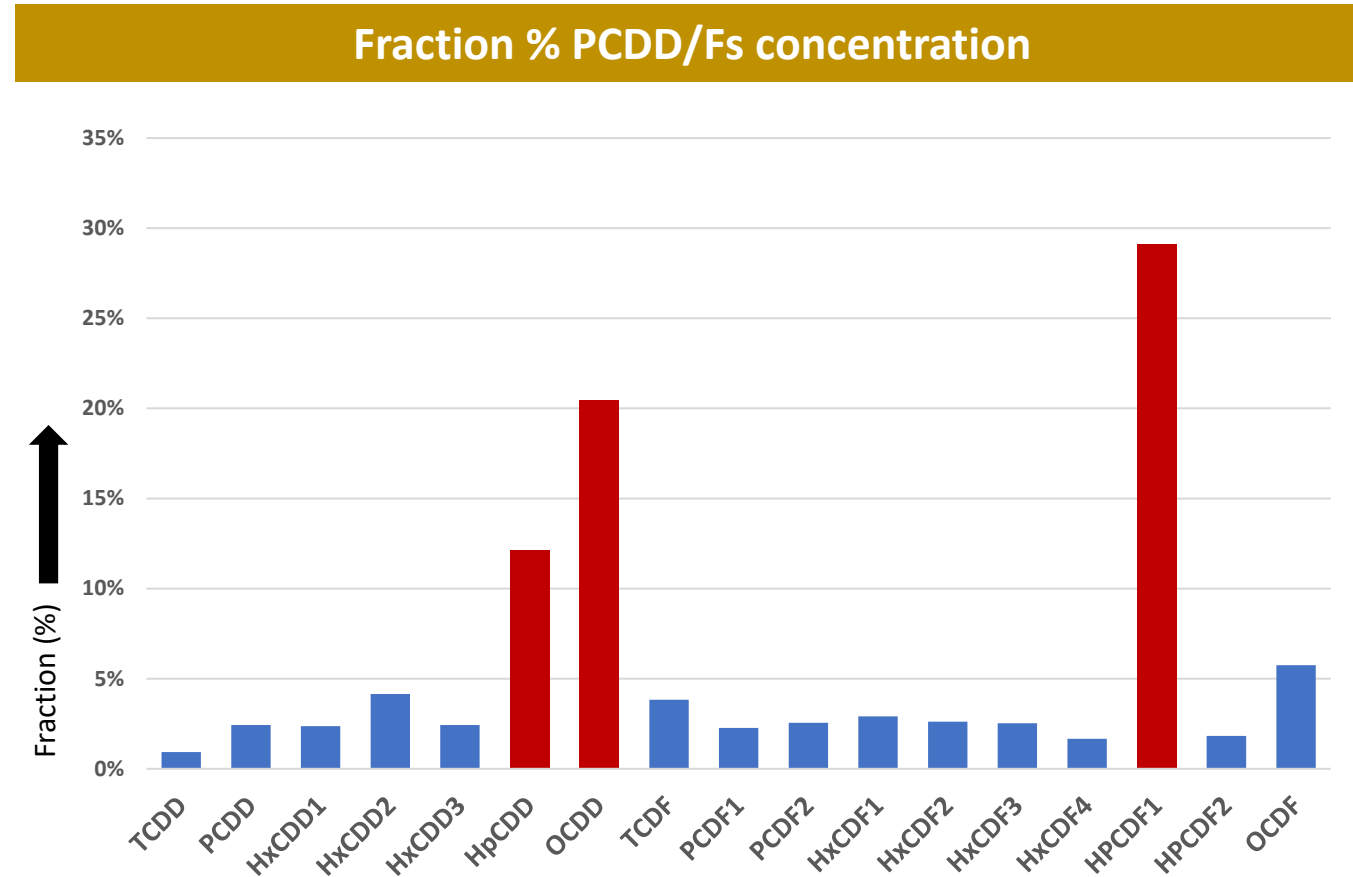
| Food (Eggs) | GC-MS <i>pg TEQ/g fat</i> |
|-------------|---------------------------|
| ≥ 2.5 | EU Limit PCDD/F |
| ≥ 5.0 | EU Limit PCDD/F/dl-PCB |
| ≥ 1.75 | EU Action level PCDD/F |
| ≥ 1.75 | EU Action level dl-PCB |



Egg location 1

Pilsen Czech Rep. - 2021

| | |
|---------------------|---------------|
| TW-REF-NR | TW-CZ21-Egg01 |
| Sample date | 28/07/2021 |
| Distance | 3400 |
| N hens | 20 |
| N rooster | - |
| Age | - |
| Eggs/month | 240 |
| Area m2 | 360 |
| Outdoor fireplace | moderate |
| Wood burning stove | many times |
| Pesticides use | no |
| Industry nearby | no |
| Highway nearby | no |
| DR CALUX BEQ | |
| PCDD/F | 2.10 |
| dl-PCB | 1.70 |
| PCDD/F/dl-PCB | 3.80 |
| GC-MS TEQ | |
| PCDD/F | 2.20 |
| dl-PCB | 1.40 |
| PCDD/F/dl-PCB | 3.60 |



GC-MS analysis complies with EU limit of dioxins in food

DR CALUX PCDD/F and PCDD/F/dl/PCB are suspect

Action level for PCDD/F is exceeded

Egg location 1

Pilsen Czech Rep. - 2021

| | |
|---------------------|---------------|
| TW-REF-NR | TW-CZ21-Egg01 |
| Sample date | 28/07/2021 |
| Distance | 3400 |
| N hens | 20 |
| Age | - |
| Eggs/month | 240 |
| DR CALUX BEQ | |
| PCDD/F BEQ | 2,10 |
| dl-PCB | 1,70 |
| PCDD/F/dl-PCB | 3,80 |
| GC-MS TEQ | |
| PCDD/F BEQ | 2,20 |
| dl-PCB | 1,40 |
| PCDD/F/dl-PCB | 3,60 |



Exceeding limit PCDD/F and PCDD/F/dl/PCB with DR CALUX bioassay

GC-MS analysis complies with EU limit of dioxins in food

Action level for PCDD/F



Egg location 1

Pilsen Czech Rep. - 2021

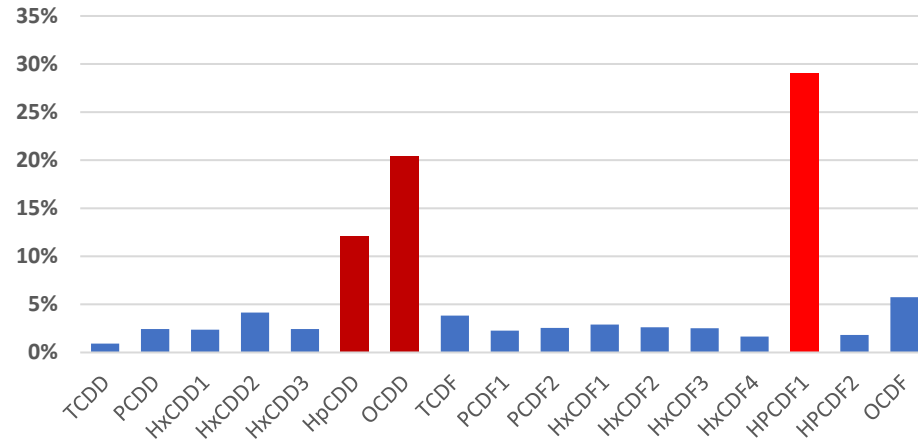
| | |
|---------------|---------------|
| TW-REF-NR | TW-CZ21-Egg01 |
| Sample date | 28/07/2021 |
| Distance | 3400 |
| N hens | 20 |
| Age | - |
| Eggs/month | 240 |
| DR CALUX BEQ | |
| PCDD/F BEQ | 2,10 |
| dl-PCB | 1,70 |
| PCDD/F/dl-PCB | 3,80 |
| GC-MS TEQ | |
| PCDD/F BEQ | 2,20 |
| dl-PCB | 1,40 |
| PCDD/F/dl-PCB | 3,60 |

Exceeding limit PCDD/F and PCDD/F/dl/PCB with DR CALUX bioassay

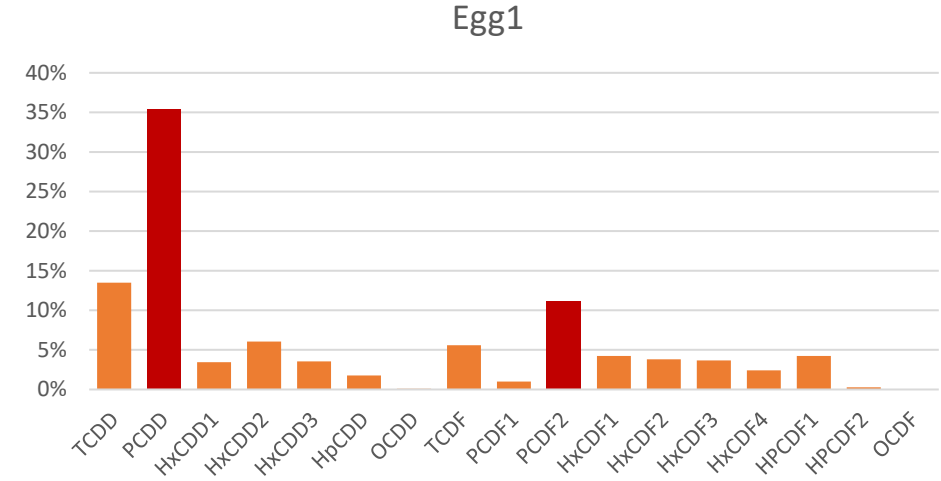
GC-MS analysis complies with EU limit of dioxins in food

Action level for PCDD/F

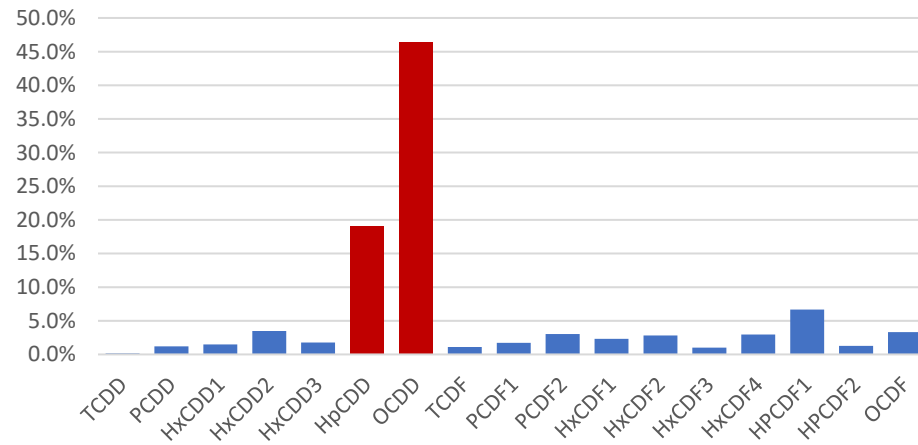
Fraction of total (%)



Fraction of total TEQ (%)

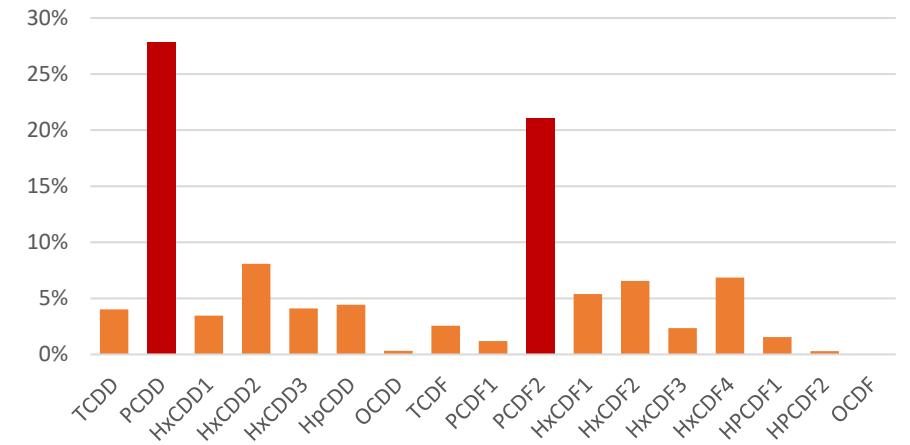


Fraction of total (%)



Incinerator REC (20,000 hrs)

Fraction of total TEQ (%)



Egg location 2

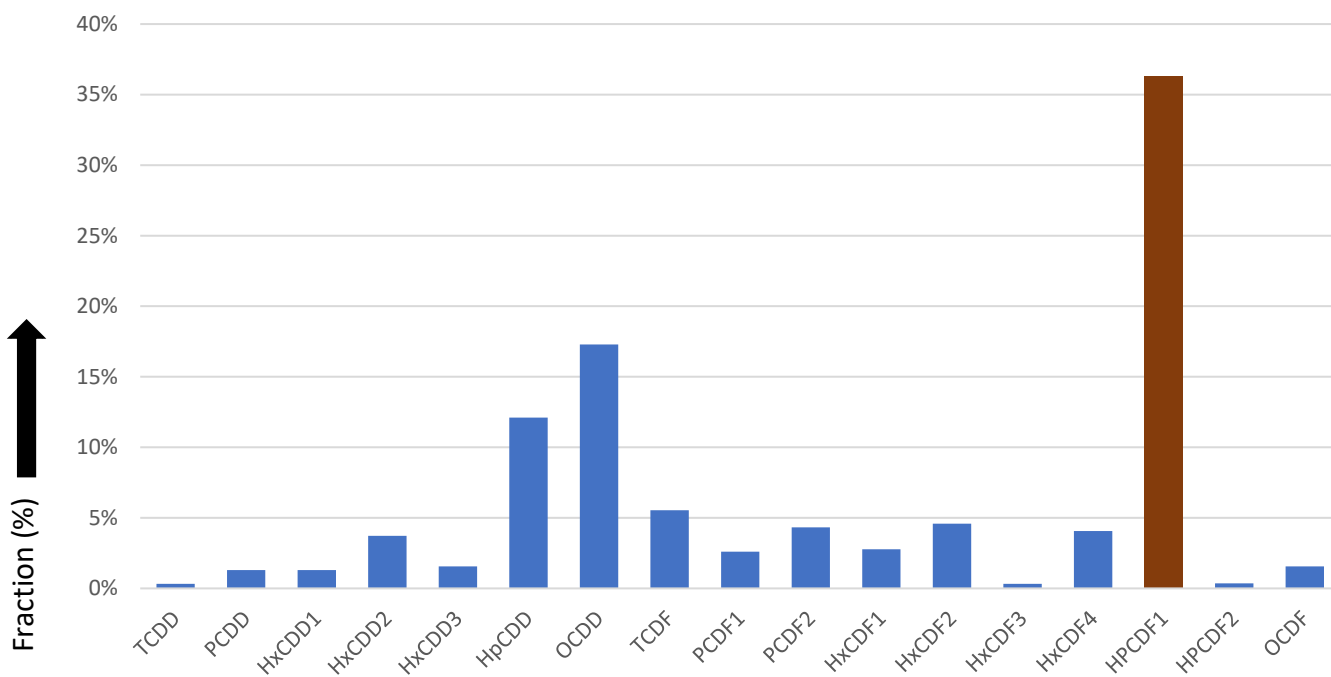
Pilsen Czech Rep. - 2021

| | |
|--------------------|---------------|
| TW-REF-NR | TW-CZ21-Egg02 |
| Sample date | 28/07/2021 |
| Distance | 4300 |
| N hens | 12 |
| N rooster | - |
| Age | 12 mnd |
| Eggs/month | 240 |
| Area m2 | 40 |
| Outdoor fireplace | no |
| Wood burning stove | not |
| Pesticides use | not |
| Industry nearby | no |
| Highway nearby | no |

| DR CALUX BEQ | |
|---------------|-------|
| PCDD/F | 10.0 |
| dl-PCB | 10.0 |
| PCDD/F/dl-PCB | 20.0 |
| GC-MS TEQ | |
| PCDD/F | 6.70 |
| dl-PCB | 16.00 |
| PCDD/F/dl-PCB | 22.00 |

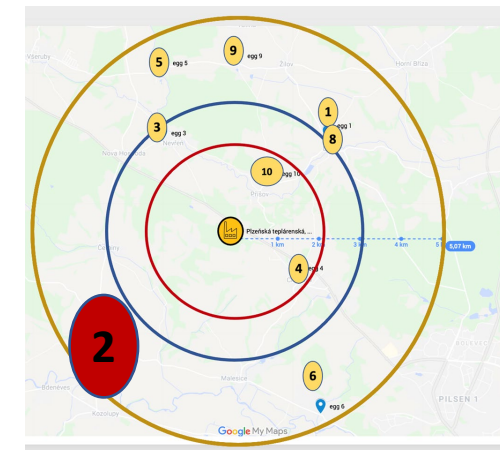
DR CALUX PCDD/F and PCDD/F/dl/PCB are suspect

Fraction % PCDD/Fs concentration



NOT Complying with EU limit of PCDD/F and the sum of PCDD/F/dl-PCBs TEQ.

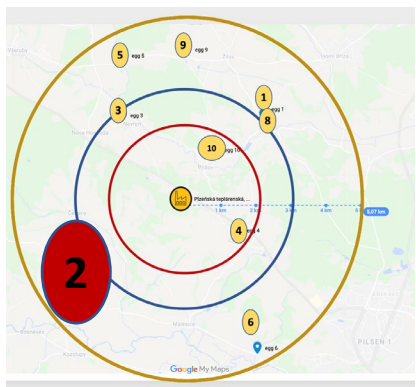
Action level dl-PCB is exceeded



Egg location 2

Pilsen Czech Rep. - 2021

| | |
|---------------|---------------|
| TW-REF-NR | TW-CZ21-Egg02 |
| Sample date | 28/07/2021 |
| Distance | 4300 |
| N hens | 12 |
| Age | 12 mnd |
| Eggs/month | 240 |
| DR CALUX BEQ | |
| PCDD/F BEQ | 10.00 |
| dl-PCB | 10.00 |
| PCDD/F/dl-PCB | 20.00 |
| GC-MS TEQ | |
| PCDD/F BEQ | 6.70 |
| dl-PCB | 16.00 |
| PCDD/F/dl-PCB | 22.00 |



Egg location 2

Pilsen Czech Rep. - 2021

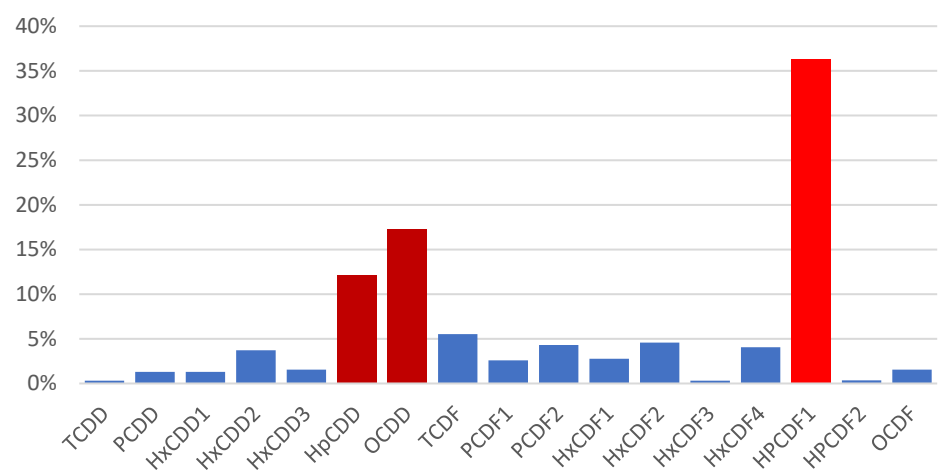
| | |
|---------------|---------------|
| TW-REF-NR | TW-CZ21-Egg02 |
| Sample date | 28/07/2021 |
| Distance | 4300 |
| N hens | 12 |
| Age | 12 mnd |
| Eggs/month | 240 |
| DR CALUX BEQ | |
| PCDD/F BEQ | 10.00 |
| dl-PCB | 10.00 |
| PCDD/F/dl-PCB | 20.00 |
| GC-MS TEQ | |
| PCDD/F BEQ | 6.70 |
| dl-PCB | 16.00 |
| PCDD/F/dl-PCB | 22.00 |

Exceeding limit PCDD/F and PCDD/F/dl/PCB with DR CALUX bioassay

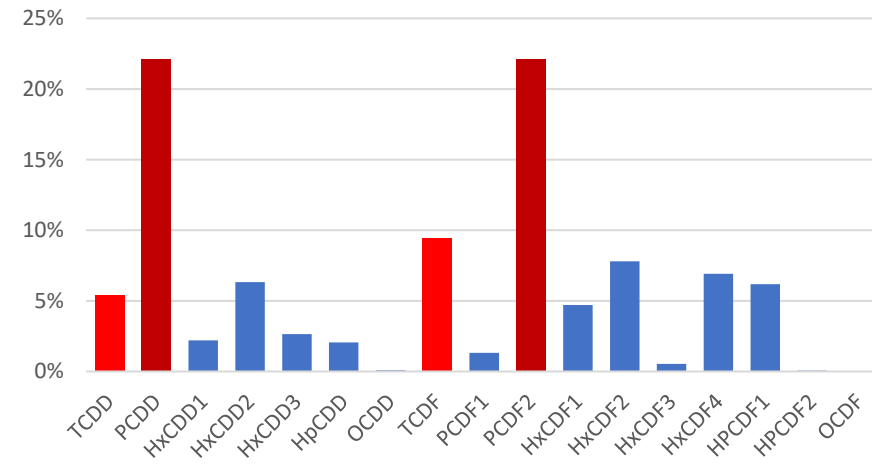
Action level dl-PCB

NOT Complying with EU limit of PCDD/F and the sum of PCDD/F/dl-PCBs TEQ.

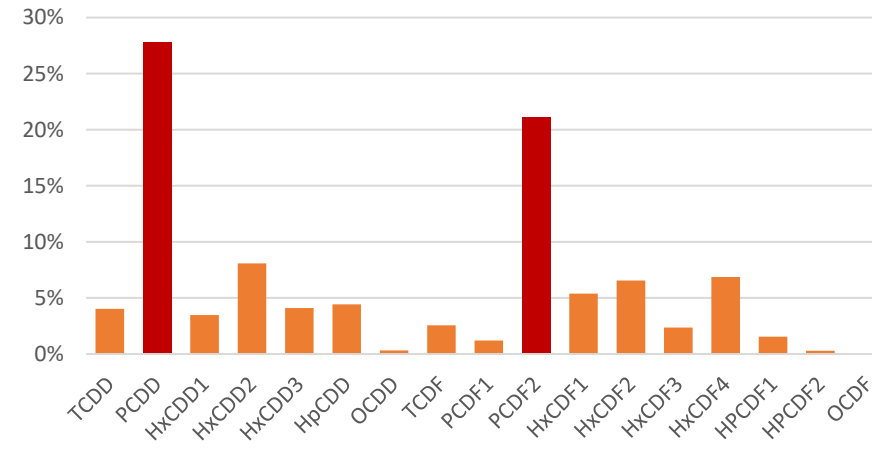
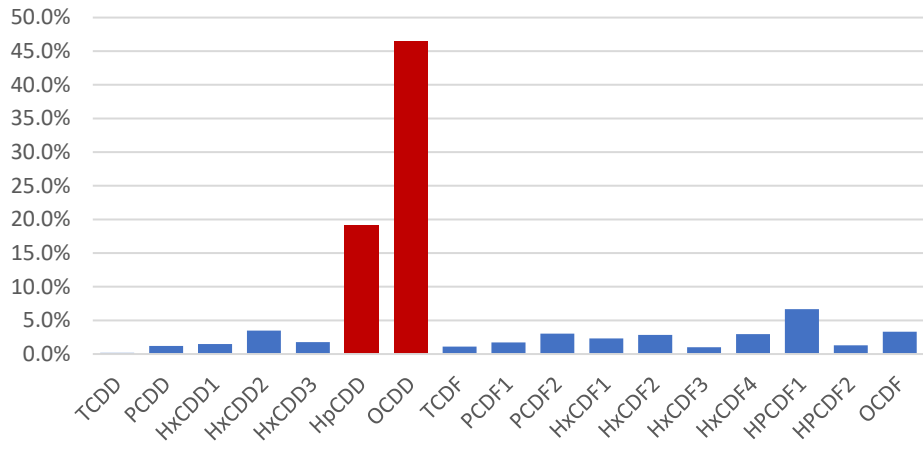
Fraction of total (%)



Fraction of total TEQ (%)



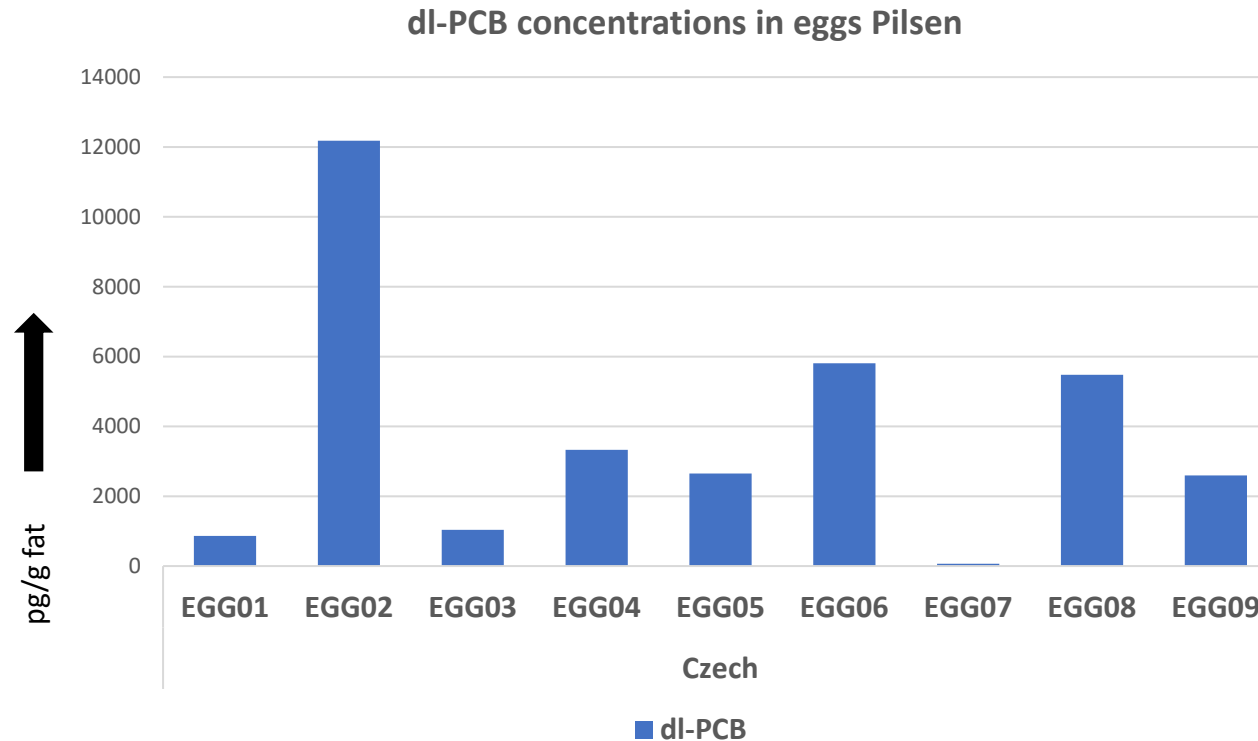
Fraction of total (%) Incinerator REC (20,000 hrs) Fraction of total TEQ (%)



Egg location 2

dl-PCB Pilsen Czech Rep. - 2021

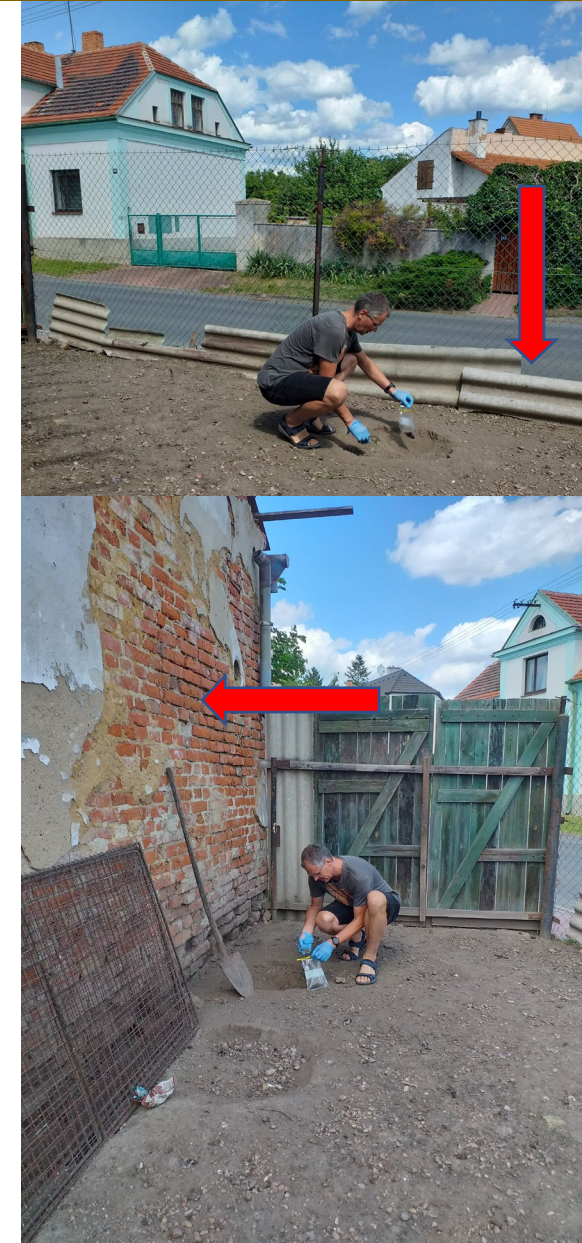
| TW-CZ21-Egg02 | |
|---------------|--------|
| pg/g fat | Egg-02 |
| PCB77 | 270 |
| PCB81 | 12 |
| PCB126 | 150 |
| PCB169 | 20 |
| PCB105 | 840 |
| PCB114 | 44 |
| PCB118 | 5400 |
| PCB123 | < 2 |
| PCB156 | 3200 |
| PCB157 | 400 |
| PCB167 | 1200 |
| PCB189 | 640 |
| dl-PCB sum | 12178 |
| dl-PCB TEQ | 16.00 |



dl-PCB: 12178 pg/g fat = 16.00 pg TEQ/g fat

Action level dl-PCB TEQ is exceeded on location egg 2

NOT Complying with EU limit of PCDD/F and the sum of PCDD/F/dl-PCBs TEQ.



Egg location 2

dl-PCB Pilsen Czech Rep. - 2021

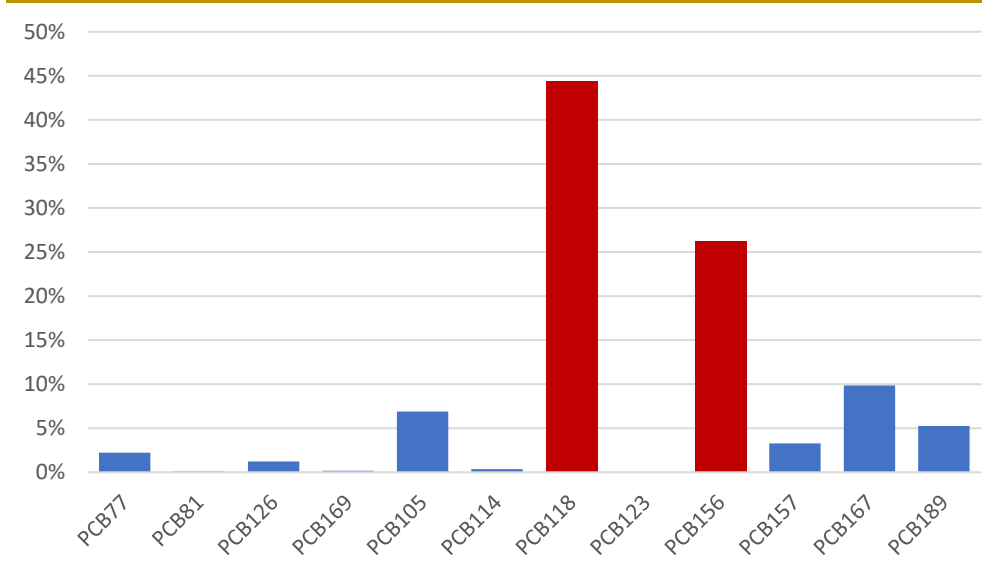
| TW-CZ21-Egg02 | |
|---------------|--------|
| pg/g fat | Egg-02 |
| PCB77 | 270 |
| PCB81 | 12 |
| PCB126 | 150 |
| PCB169 | 20 |
| PCB105 | 840 |
| PCB114 | 44 |
| PCB118 | 5400 |
| PCB123 | < 2 |
| PCB156 | 3200 |
| PCB157 | 400 |
| PCB167 | 1200 |
| PCB189 | 640 |
| | |
| dl-PCB sum | 12178 |
| dl-PCB TEQ | 16.00 |

dl-PCB: 12178 pg/g fat

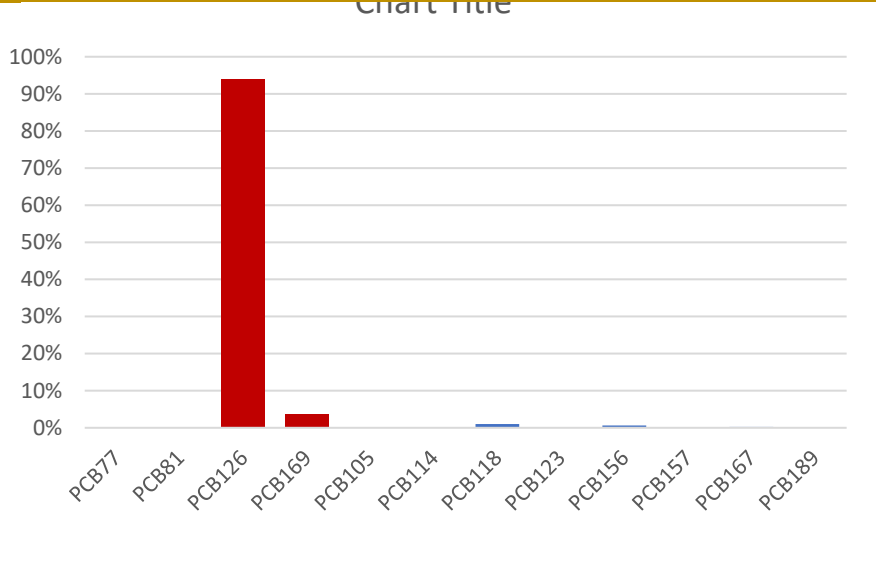
Action level dl-PCB TEQ is exceeded

NOT Complying with EU limit of PCDD/F and the sum of PCDD/F/dl-PCBs TEQ.

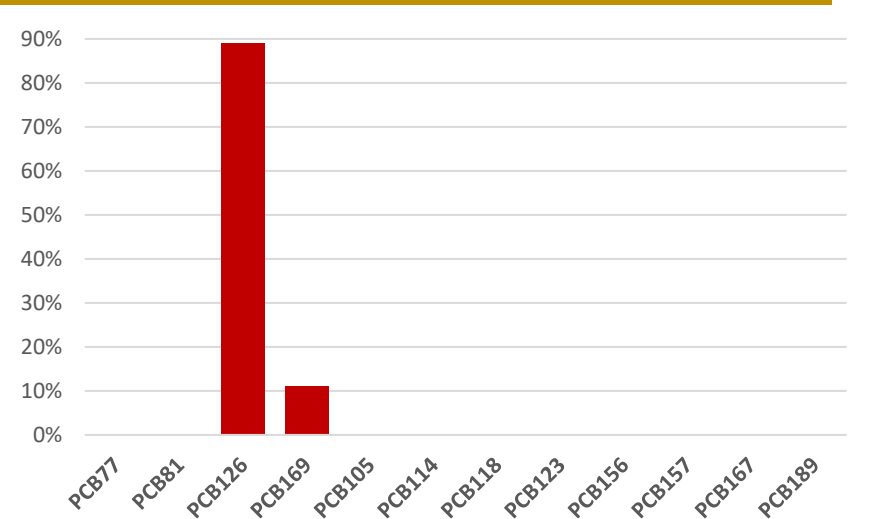
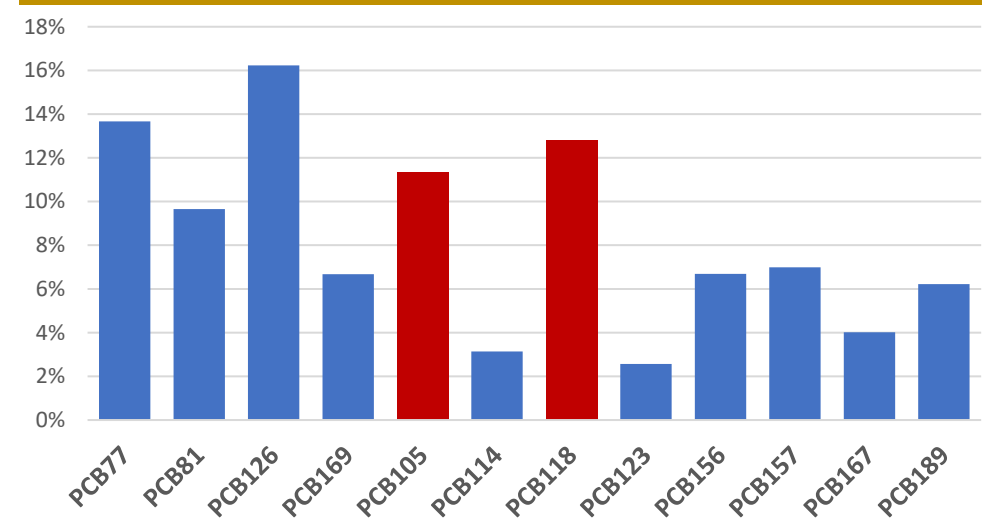
Fraction of total DL-PCB (%)



Fraction of TEQ DL-PCB (%)



Incinerator PCB pattern (REC NL)



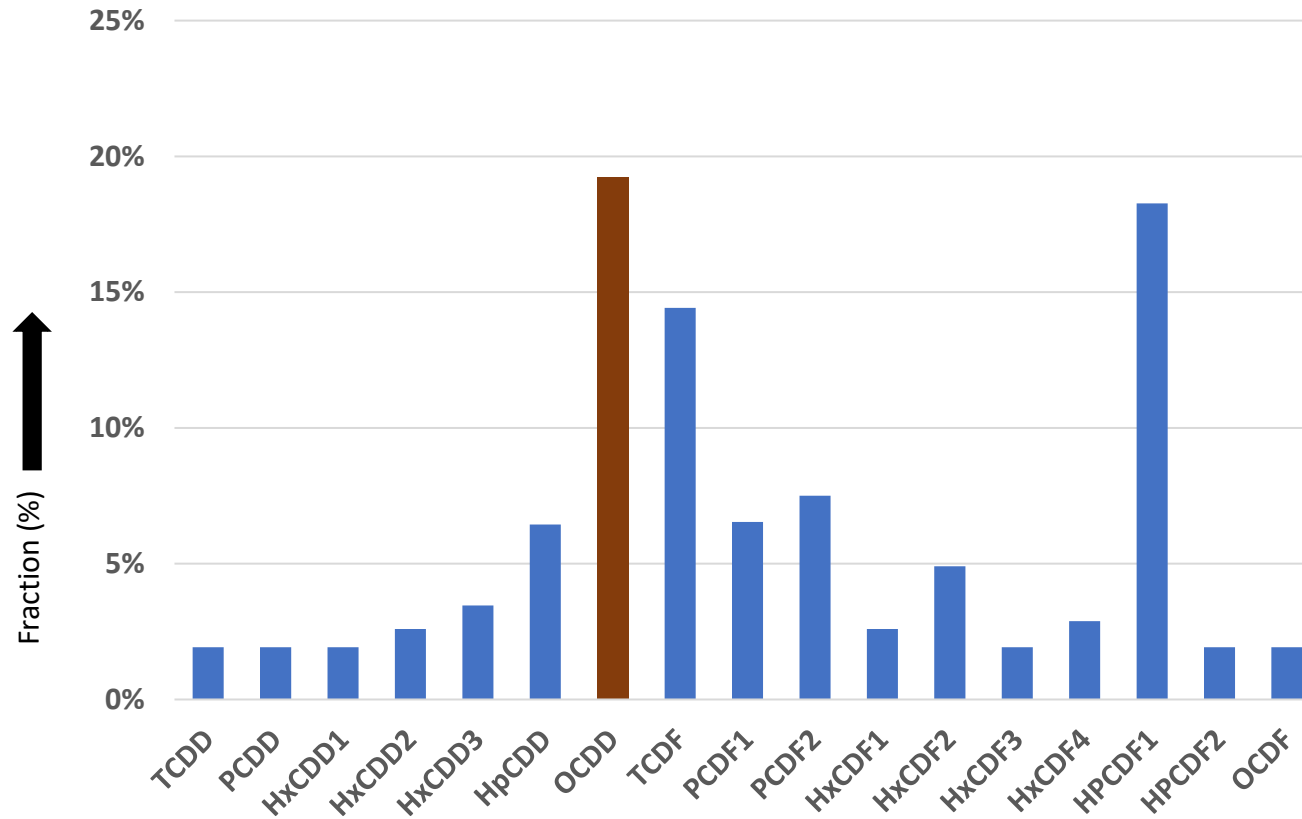
Egg location 3

Pilsen Czech Rep. - 2021

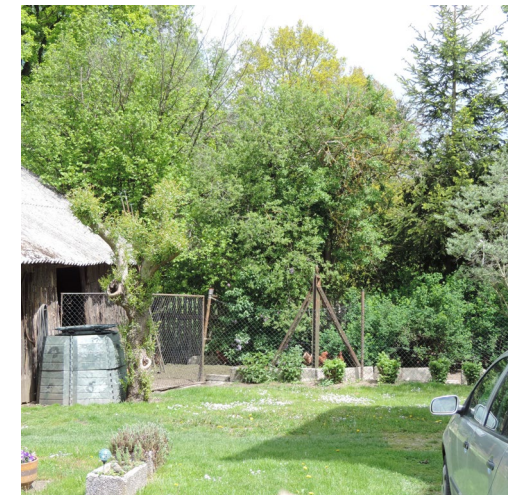
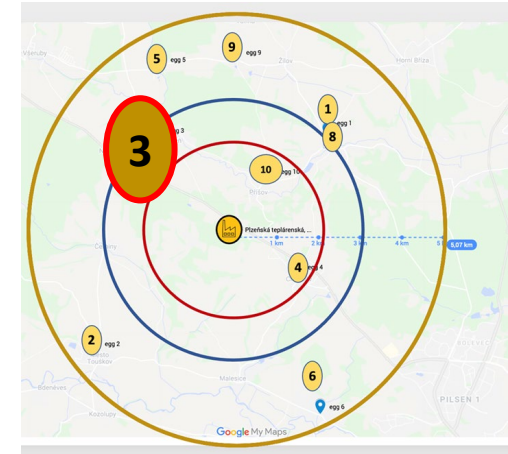
| | |
|---------------------|---------------|
| TW-REF-NR | TW-CZ21-Egg03 |
| Sample date | 28/07/2021 |
| Distance | 3000 |
| N hens | 20 |
| N rooster | - |
| Age | - |
| Eggs/month | 300 |
| Area m2 | 160 |
| Outdoor fireplace | moderate |
| Wood burning stove | often |
| Pesticides use | not |
| Industry nearby | no |
| Highway nearby | no |
| DR CALUX BEQ | |
| PCDD/F | 1.70 |
| dI-PCB | 2.60 |
| PCDD/F/dI-PCB | 4.30 |
| GC-MS TEQ | |
| PCDD/F | 1.00 |
| dI-PCB | 1.20 |
| PCDD/F/dI-PCB | 2.20 |

DR CALUX PCDD/F and PCDD/F/dI/PCB are suspect

Fraction % PCDD/Fs concentration



GC-MS analysis complies with EU limit of dioxins in food



Egg location 3

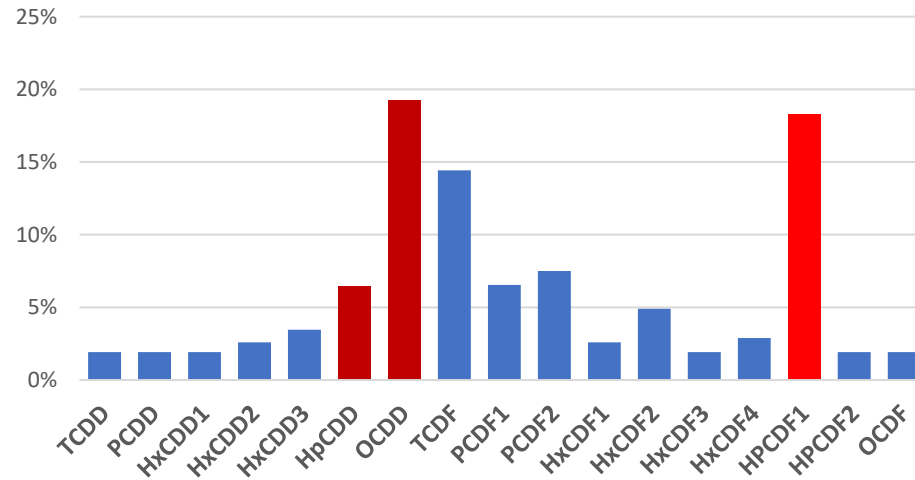
Pilsen Czech Rep. - 2021

| | |
|---------------------|---------------|
| TW-REF-NR | TW-CZ21-Egg03 |
| Sample date | 28/07/2021 |
| Distance | 3000 |
| N hens | 20 |
| Age | - |
| Eggs/month | 300 |
| DR CALUX BEQ | |
| PCDD/F BEQ | 1.70 |
| dI-PCB | 2.60 |
| PCDD/F/dI-PCB | 4.30 |
| GC-MS TEQ | |
| PCDD/F BEQ | 1.00 |
| dI-PCB | 1.20 |
| PCDD/F/dI-PCB | 2.20 |

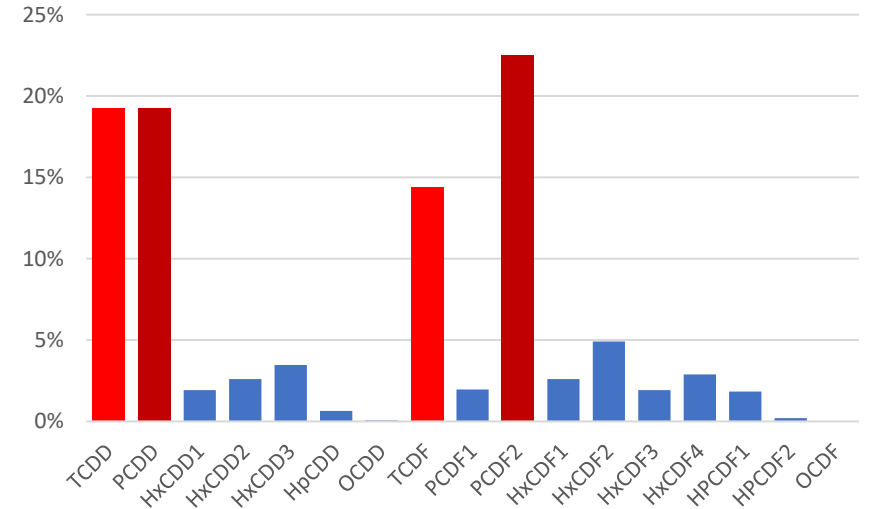
Exceeding limit PCDD/F and PCDD/F/dI/PCB with DR CALUX bioassay

GC-MS analysis complies with EU limit of dioxins in eggs

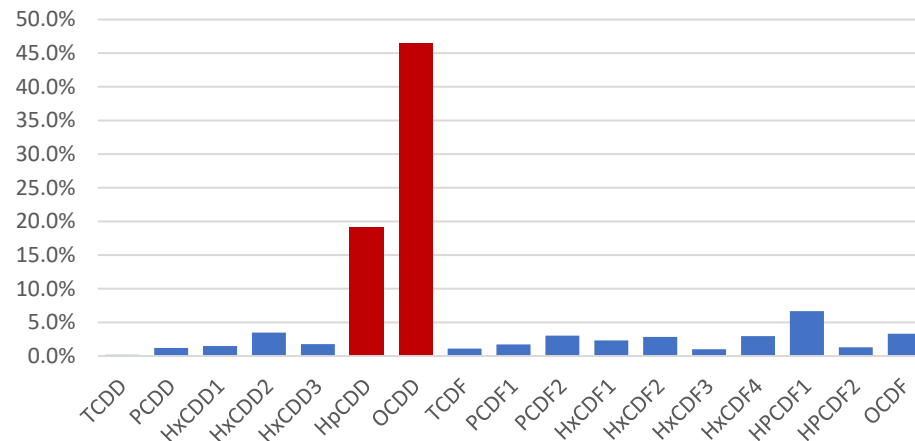
Fraction of total (%)



Fraction of total TEQ (%)

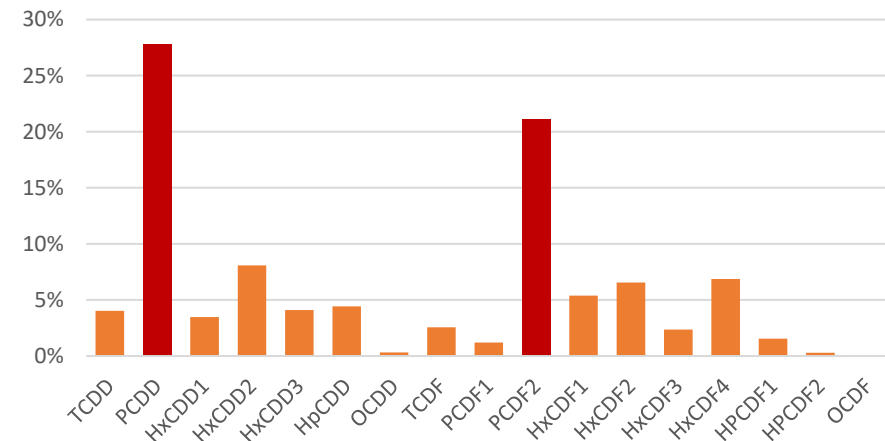


Fraction of total (%)



Incinerator REC (20,000 hrs)

Fraction of total TEQ (%)



Egg location 3

Pilsen Czech Rep. - 2021

| | |
|---------------------|---------------|
| TW-REF-NR | TW-CZ21-Egg03 |
| Sample date | 28/07/2021 |
| Distance | 3000 |
| N hens | 20 |
| Age | - |
| Eggs/month | 300 |
| DR CALUX BEQ | |
| PCDD/F BEQ | 1.70 |
| dI-PCB | 2.60 |
| PCDD/F/dI-PCB | 4.30 |
| GC-MS TEQ | |
| PCDD/F BEQ | 1.00 |
| dI-PCB | 1.20 |
| PCDD/F/dI-PCB | 2.20 |



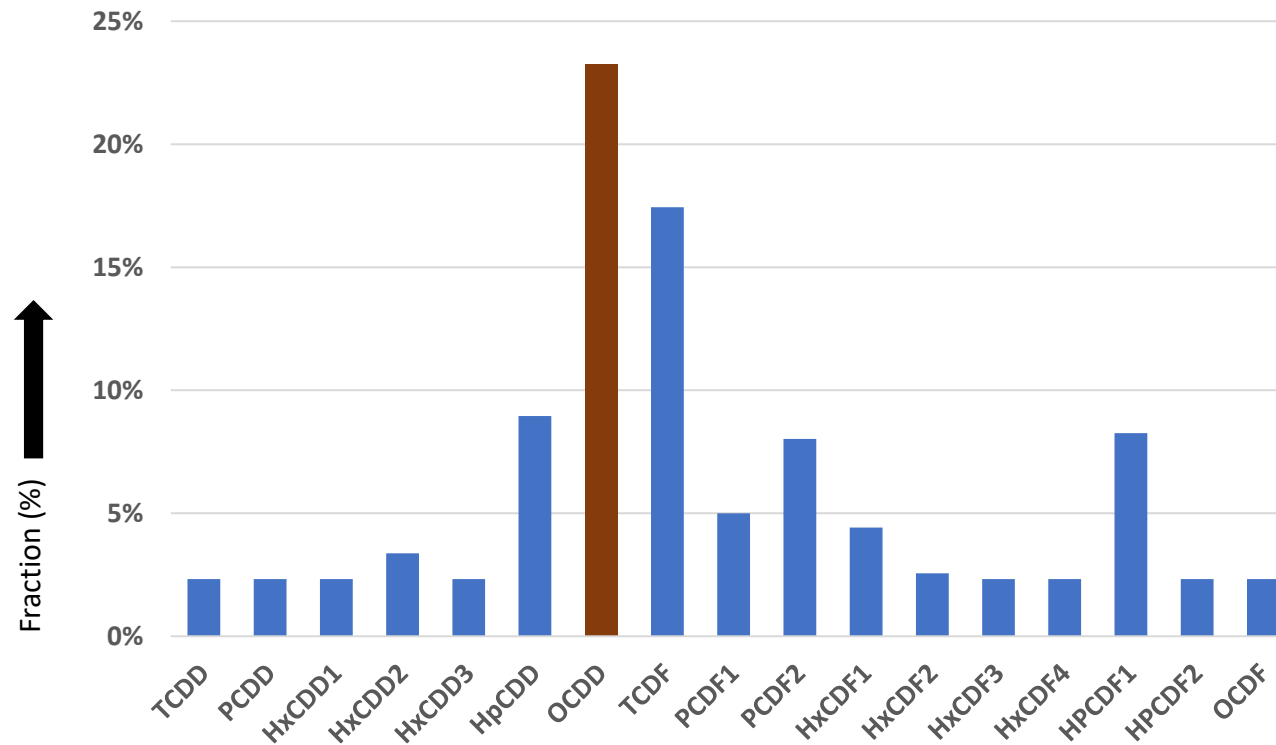
Egg location 4

Pilsen Czech Rep. - 2021

| | |
|---------------------|---------------|
| TW-REF-NR | TW-CZ21-Egg04 |
| Sample date | 28/07/2021 |
| Distance | 1730 |
| N hens | 14 |
| N rooster | - |
| Age | 12 mnd |
| Eggs/month | 150 |
| Area m2 | 150 |
| Outdoor fireplace | moderate |
| Wood burning stove | many times |
| Pesticides use | not |
| Industry nearby | no |
| Highway nearby | no |
| DR CALUX BEQ | |
| PCDD/F | 1.30 |
| dl-PCB | 2.00 |
| PCDD/F/dl-PCB | 3.30 |
| GC-MS TEQ | |
| PCDD/F | 0.95 |
| dl-PCB | 3.00 |
| PCDD/F/dl-PCB | 4.00 |

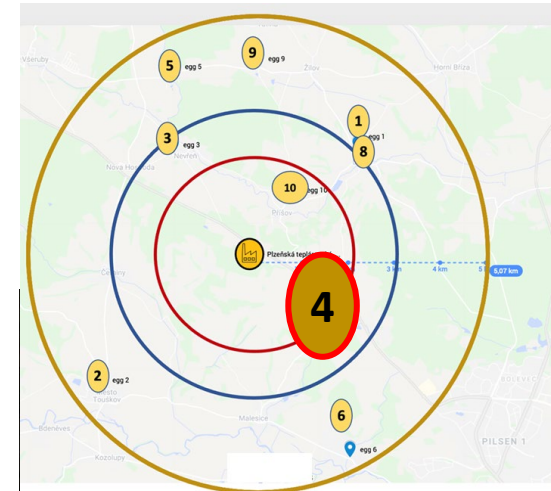
**DR CALUX PCDD/F/dl-PCB
Is suspect**

Fraction % PCDD/Fs concentration



GC-MS analysis complies with EU limit of dioxins in food for the sum of PCDD/F/dl-PCB

Action-level for dl-PCB is exceeded



Egg location 4

Pilsen Czech Rep. - 2021

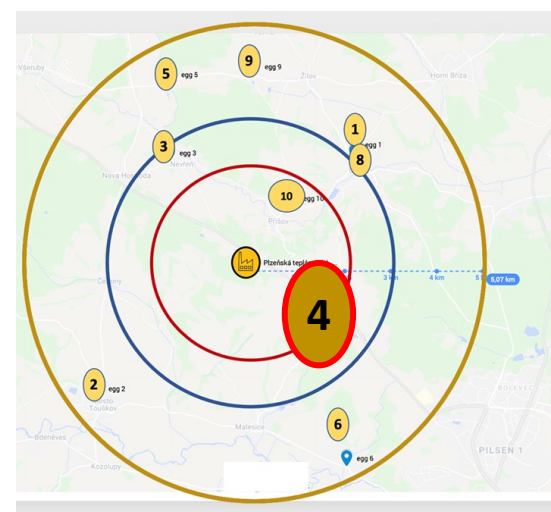
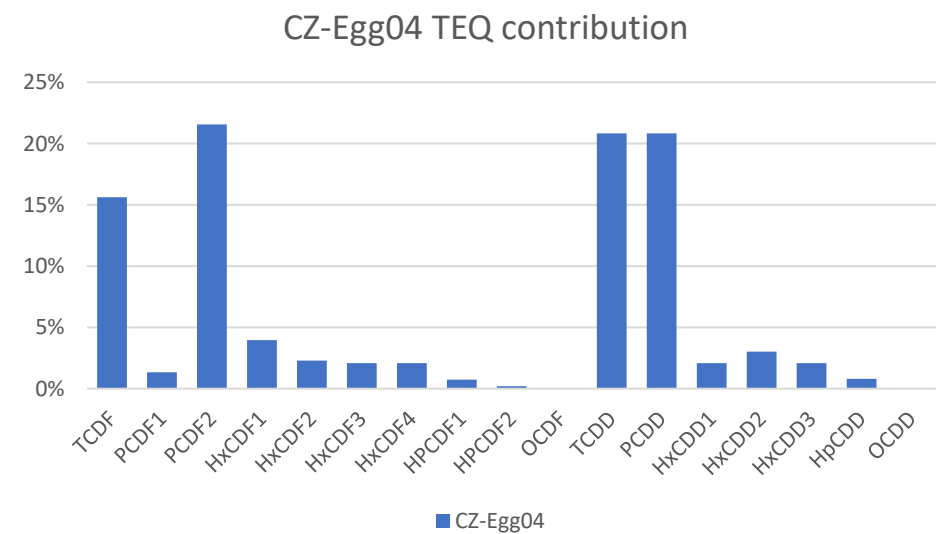
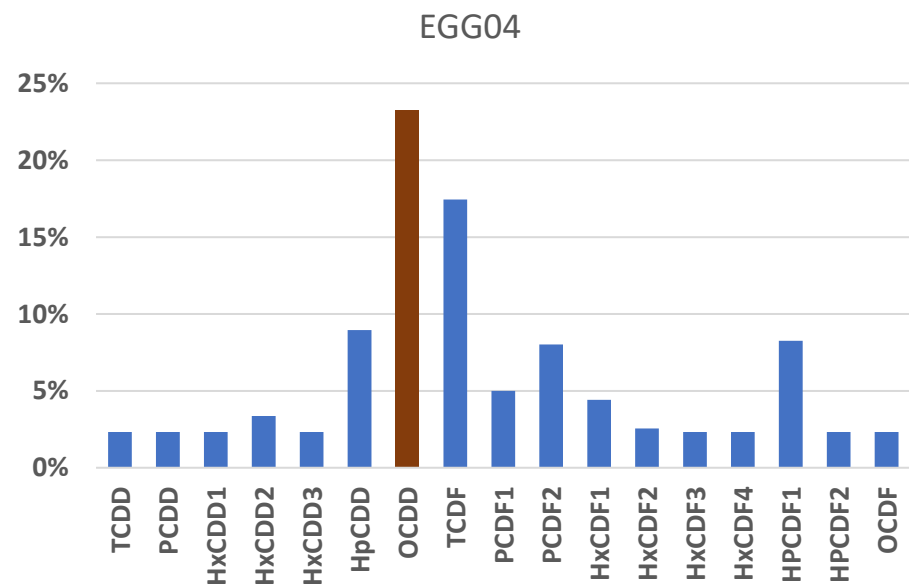
| | |
|--------------------|---------------|
| TW-REF-NR | TW-CZ21-Egg04 |
| Sample date | 28/07/2021 |
| Distance | 1730 |
| N hens | 14 |
| N rooster | - |
| Age | 12 mnd |
| Eggs/month | 150 |
| Area m2 | 150 |
| Outdoor fireplace | moderate |
| Wood burning stove | many times |
| Pesticides use | not |
| Industry nearby | no |
| Highway nearby | no |

| DR CALUX BEQ | |
|---------------|------|
| PCDD/F | 1.30 |
| dl-PCB | 2.00 |
| PCDD/F/dl-PCB | 3.30 |
| GC-MS TEQ | |
| PCDD/F | 0.95 |
| dl-PCB | 3.00 |
| PCDD/F/dl-PCB | 4.00 |

DR CALUX PCDD/F/dl-PCB is suspect

Action-level for dl-PCB is exceeded

GC-MS analysis complies with EU limit of dioxins in food for the sum of PCDD/F/dl-PCB



Egg location 4

Pilsen Czech Rep. - 2021

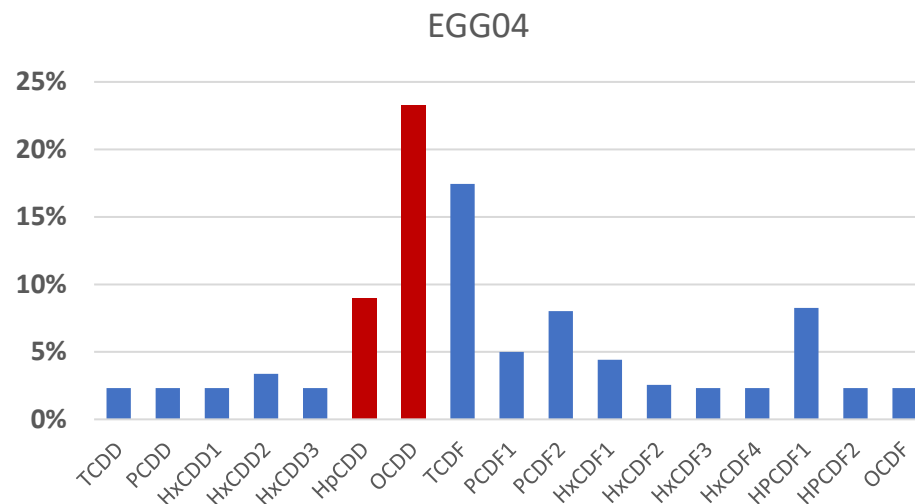
| | |
|---------------|---------------|
| TW-REF-NR | TW-CZ21-Egg04 |
| Sample date | 28/07/2021 |
| Distance | 1730 |
| N hens | 14 |
| Age | 12 mnd |
| Eggs/month | 150 |
| DR CALUX BEQ | |
| PCDD/F BEQ | 1.30 |
| dl-PCB | 2.00 |
| PCDD/F/dl-PCB | 3.30 |
| GC-MS TEQ | |
| PCDD/F BEQ | 0.95 |
| dl-PCB | 3.00 |
| PCDD/F/dl-PCB | 4.00 |

Exceeding limit for PCDD/F/dl-PCB with DR CALUX bioassay

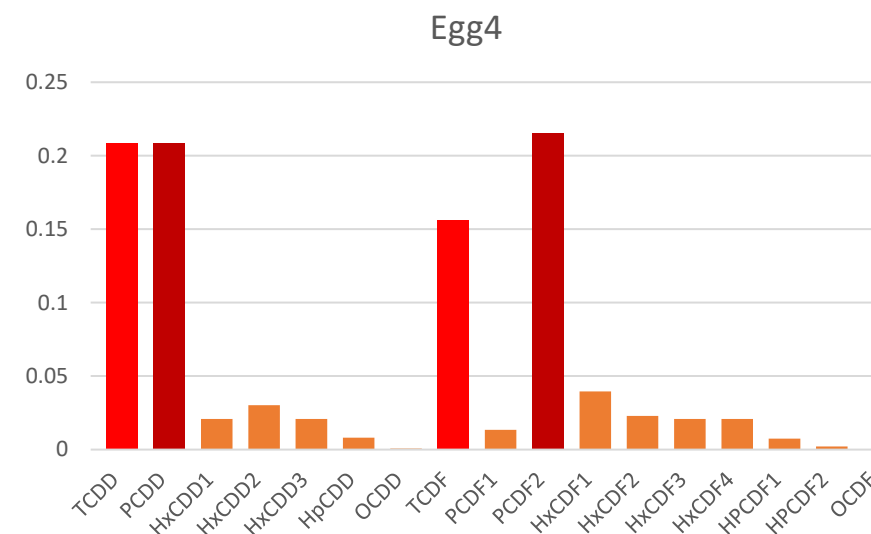
Action-level for dl-PCB

GC-MS analysis complies with EU limit of dioxins in food for the sum of PCDD/F/dl-PCB

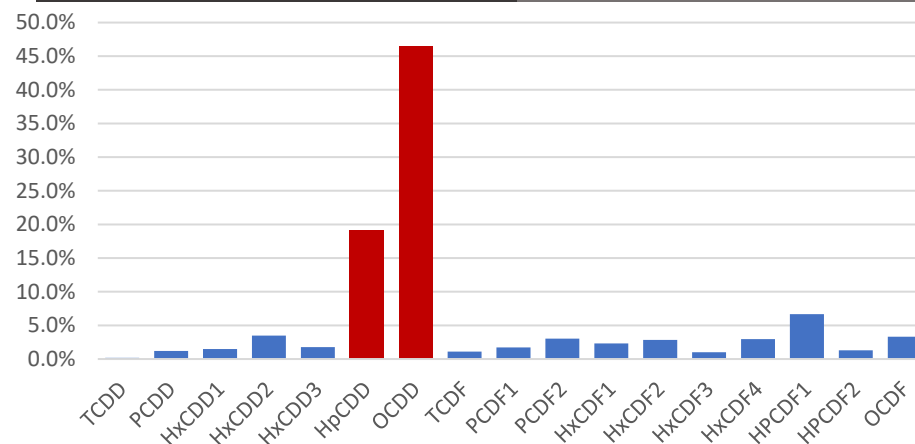
Fraction of total (%)



Fraction of total TEQ (%)

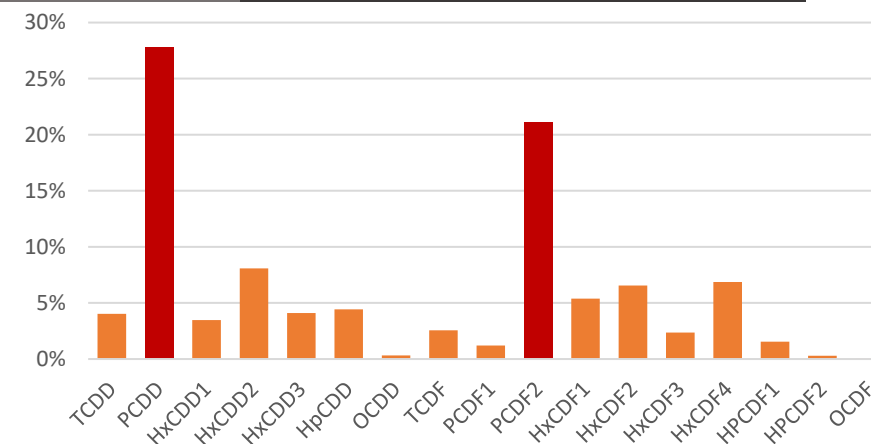


Fraction of total (%)



Incinerator REC (20,000 hrs)

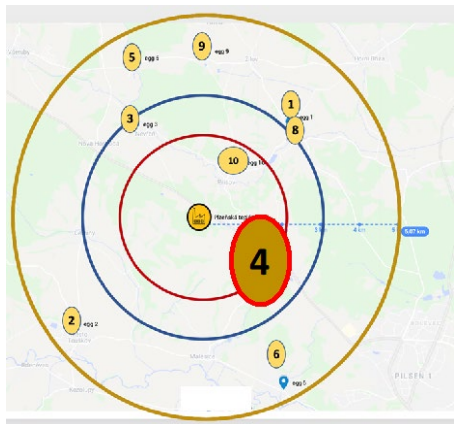
Fraction of total TEQ (%)



Egg location 4

Pilsen Czech Rep. - 2021

| | |
|---------------------|---------------|
| TW-REF-NR | TW-CZ21-Egg04 |
| Sample date | 28/07/2021 |
| Distance | 1730 |
| N hens | 14 |
| Age | 12 mnd |
| Eggs/month | 150 |
| DR CALUX BEQ | |
| PCDD/F BEQ | 1.30 |
| dI-PCB | 2.00 |
| PCDD/F/dI-PCB | 3.30 |
| GC-MS TEQ | |
| PCDD/F BEQ | 0.95 |
| dI-PCB | 3.00 |
| PCDD/F/dI-PCB | 4.00 |



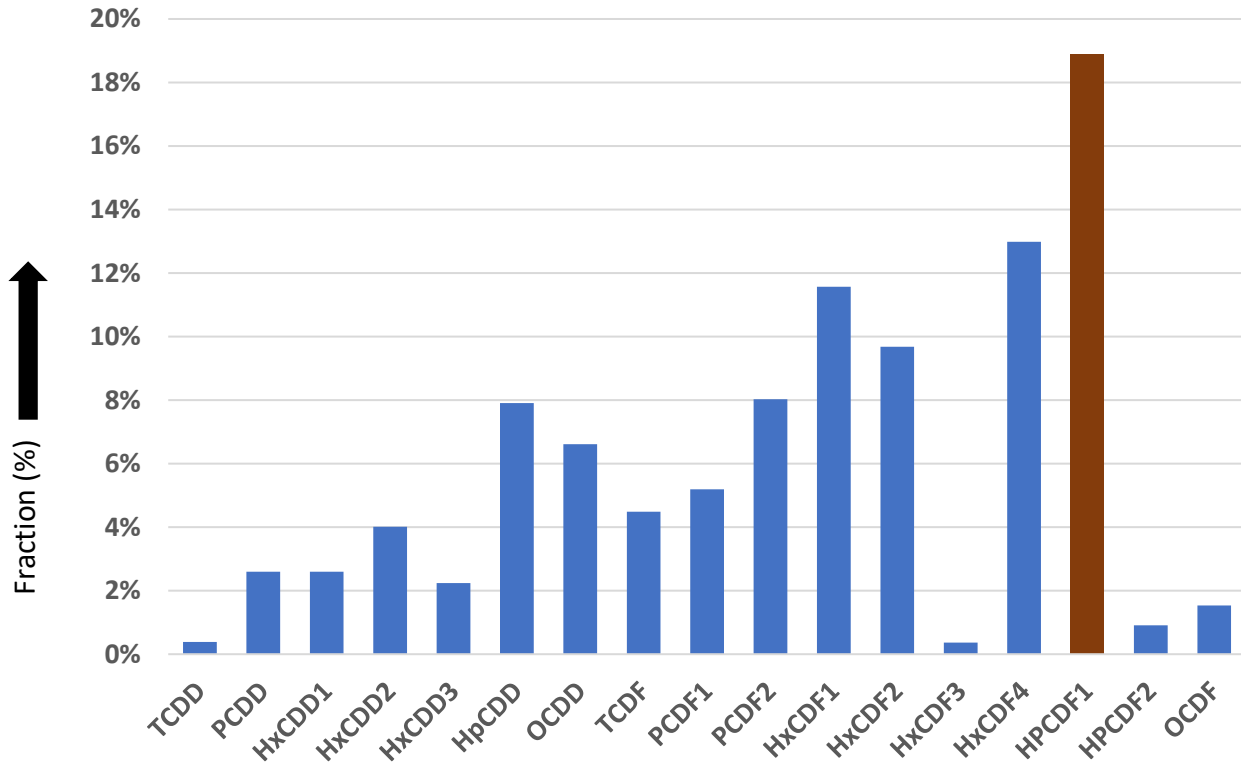
Egg location 5

Pilsen Czech Rep. - 2021

| | |
|---------------------|---------------|
| TW-REF-NR | TW-CZ21-Egg05 |
| Sample date | 28/07/2021 |
| Distance | 4510 |
| N hens | 22 |
| N rooster | 5 |
| Age | 36 mnd |
| Eggs/month | 240 |
| Area m2 | 30 |
| Outdoor fireplace | no |
| Wood burning stove | many times |
| Pesticides use | not |
| Industry nearby | no |
| Highway nearby | no |
| DR CALUX BEQ | |
| PCDD/F | 11.00 |
| dl-PCB | 7.00 |
| PCDD/F/dl-PCB | 18.00 |
| GC-MS TEQ | |
| PCDD/F | 8.90 |
| dl-PCB | 5.00 |
| PCDD/F/dl-PCB | 14.00 |

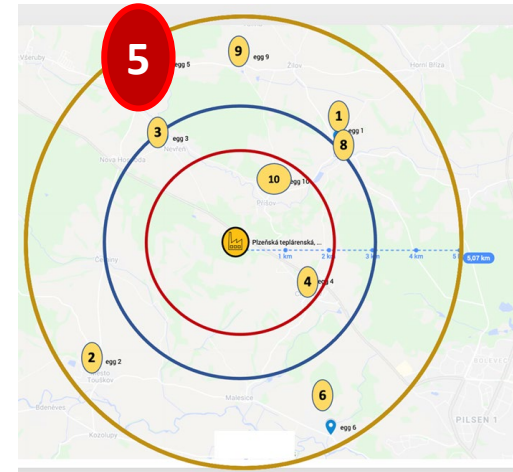
DR CALUX PCDD/F and PCDD/F/dl/PCB are suspect

Fraction % PCDD/Fs concentration



NOT Complying with EU limit of PCDD/F and the sum of PCDD/F/dl-PCBs TEQ.

Action-level for dl-PCB is exceeded



Egg location 5

Pilsen Czech Rep. - 2021

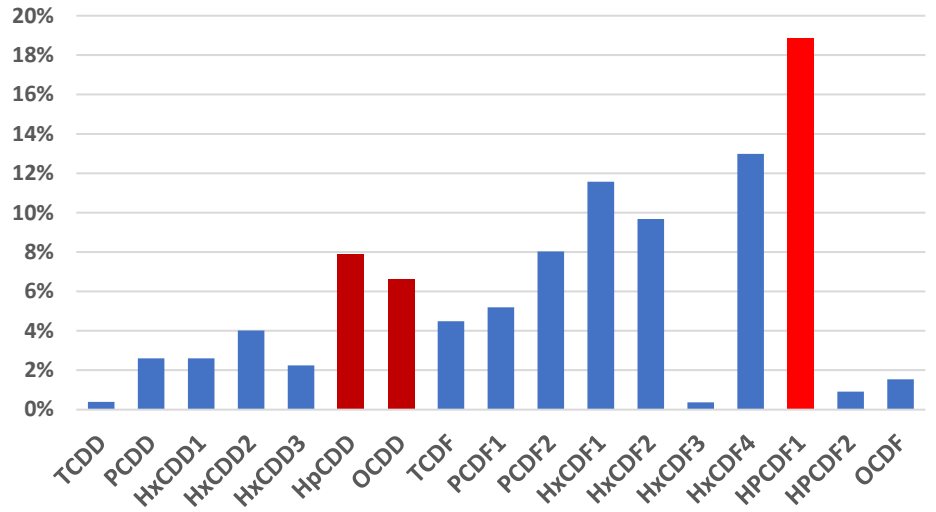
| | |
|---------------|---------------|
| TW-REF-NR | TW-CZ21-Egg05 |
| Sample date | 28/07/2021 |
| Distance | 4510 |
| N hens | 22 |
| Age | 36 mnd |
| Eggs/month | 240 |
| DR CALUX BEQ | |
| PCDD/F BEQ | 11.00 |
| dl-PCB | 7.00 |
| PCDD/F/dl-PCB | 18.00 |
| GC-MS TEQ | |
| PCDD/F BEQ | 8.90 |
| dl-PCB | 5.00 |
| PCDD/F/dl-PCB | 14.00 |

Exceeding limit PCDD/F and PCDD/F/dl/PCB with DR CALUX bioassay

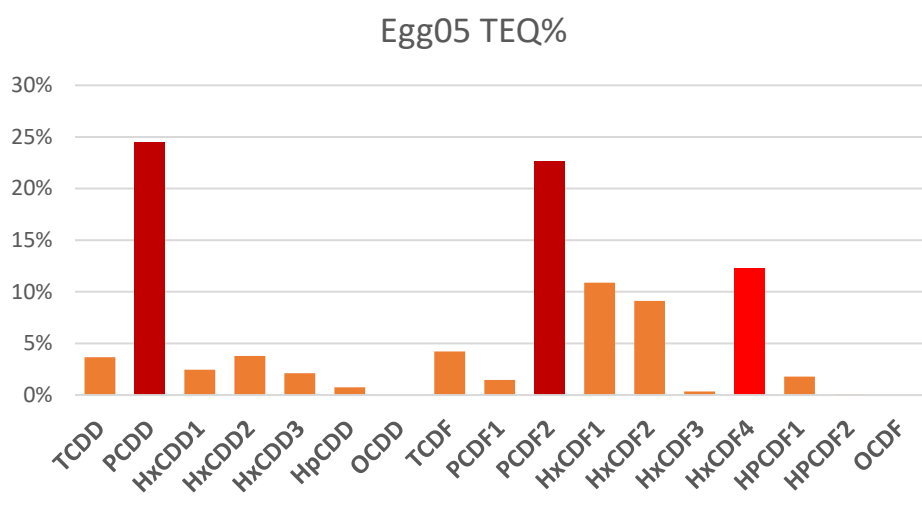
Action-level for dl-PCB

NOT Complying with EU limit of PCDD/F and the sum of PCDD/F/dl-PCBs TEQ.

Fraction of total (%)



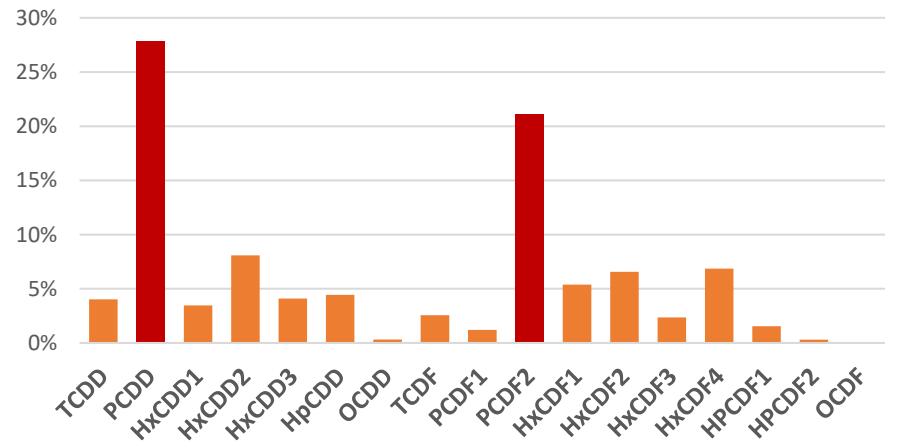
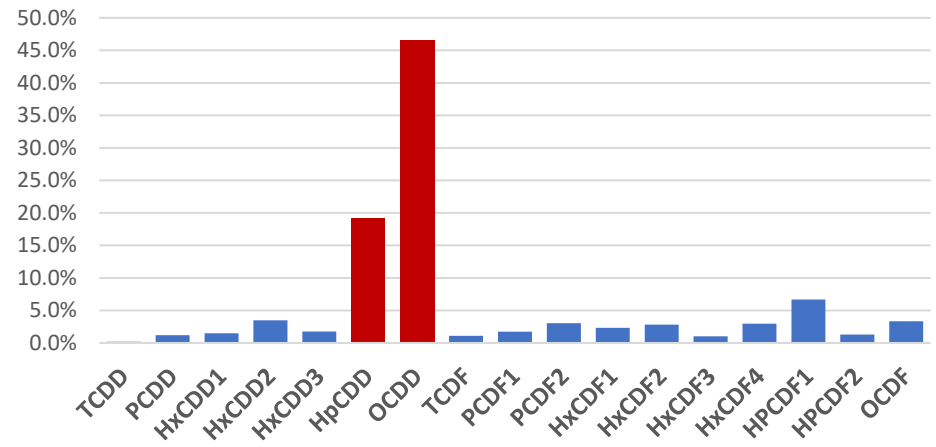
Fraction of total TEQ (%)



Fraction of total (%)

Incinerator REC NL (20,000 hrs)

Fraction of total TEQ (%)



Egg location 5

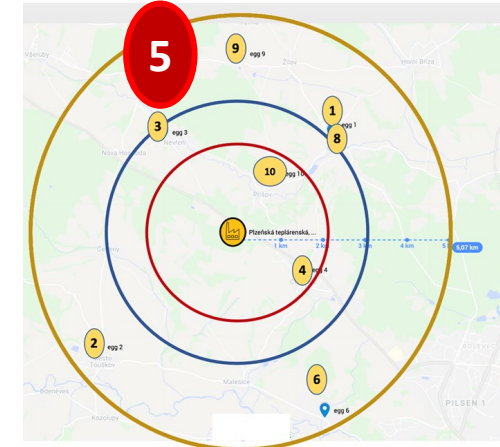
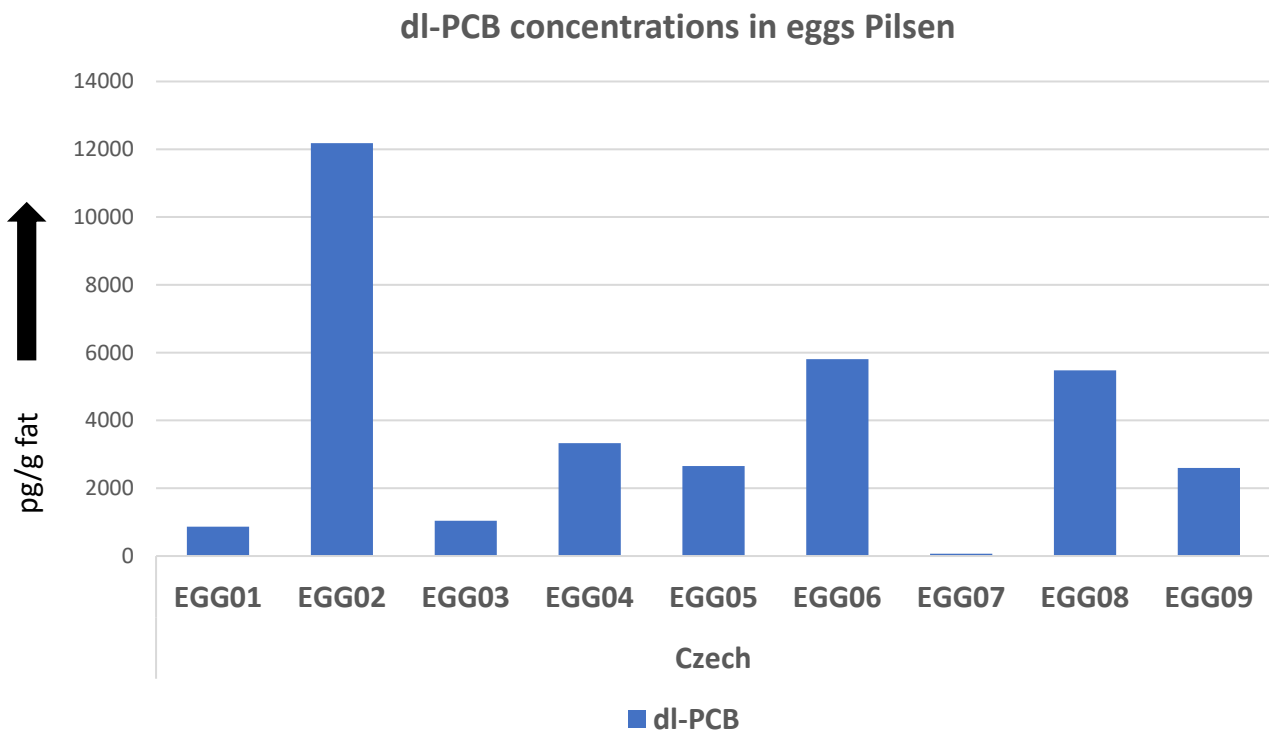
Pilsen Czech Rep. - 2021

| | |
|---------------|---------------|
| TW-REF-NR | TW-CZ21-Egg05 |
| Sample date | 28/07/2021 |
| Distance | 4510 |
| N hens | 22 |
| Age | 36 mnd |
| Eggs/month | 240 |
| DR CALUX BEQ | |
| PCDD/F BEQ | 11.00 |
| dl-PCB | 7.00 |
| PCDD/F/dl-PCB | 18.00 |
| GC-MS TEQ | |
| PCDD/F BEQ | 8.90 |
| dl-PCB | 5.00 |
| PCDD/F/dl-PCB | 14.00 |



| TW-CZ21-Egg05 | |
|---------------|--------|
| pg/g fat | Egg-05 |
| PCB77 | 37 |
| PCB81 | 5 |
| PCB126 | 45 |
| PCB169 | 14 |
| PCB105 | 250 |
| PCB114 | 16 |
| PCB118 | 1100 |
| PCB123 | < 2 |
| PCB156 | 570 |
| PCB157 | 85 |
| PCB167 | 410 |
| PCB189 | 120 |
| dl-PCB sum | 2654 |
| dl-PCB TEQ | 5.00 |

dl-PCB: 2654 pg/g fat, 5.00 pg TEQ/g fat



NOT Complying with EU limit of PCDD/F and the sum of PCDD/F/dl-PCBs TEQ.

DR CALUX PCDD/F and PCDD/F/dl-PCB are suspect

Action-level for dl-PCB is exceeded

Egg location 5

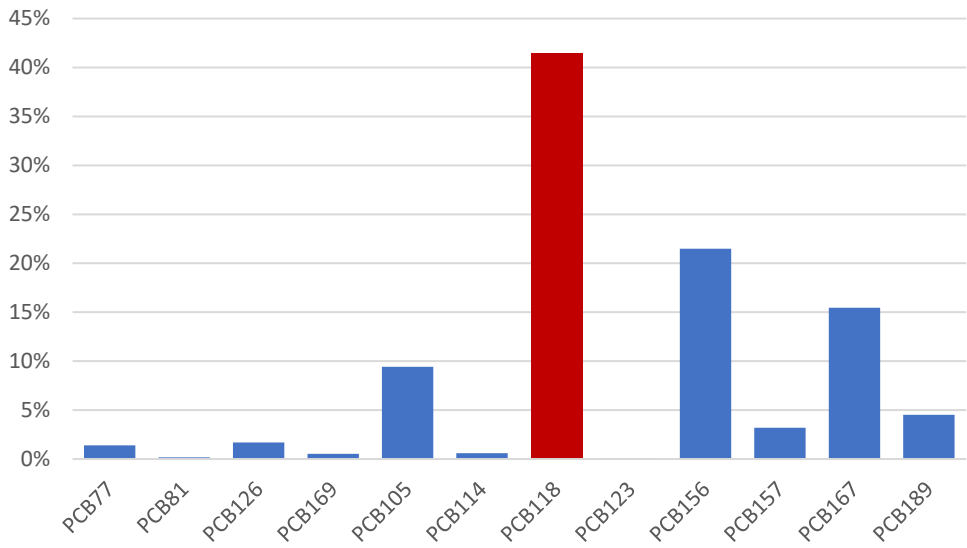
dl-PCB Pilsen Czech Rep. - 2021

| TW-CZ21-Egg05 | |
|---------------|--------|
| pg/g fat | Egg-05 |
| PCB77 | 37 |
| PCB81 | 5 |
| PCB126 | 45 |
| PCB169 | 14 |
| PCB105 | 250 |
| PCB114 | 16 |
| PCB118 | 1100 |
| PCB123 | < 2 |
| PCB156 | 570 |
| PCB157 | 85 |
| PCB167 | 410 |
| PCB189 | 120 |
| dl-PCB sum | 2654 |
| dl-PCB TEQ | 5.00 |

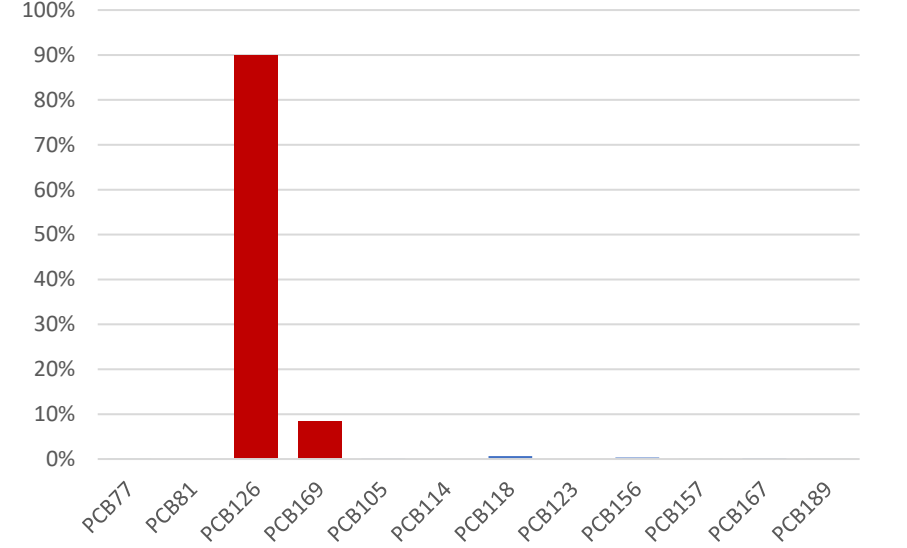
NOT Complying with EU limit of PCDD/F/dl-PCBs TEQ.

Action-level for dl-PCB is exceeded

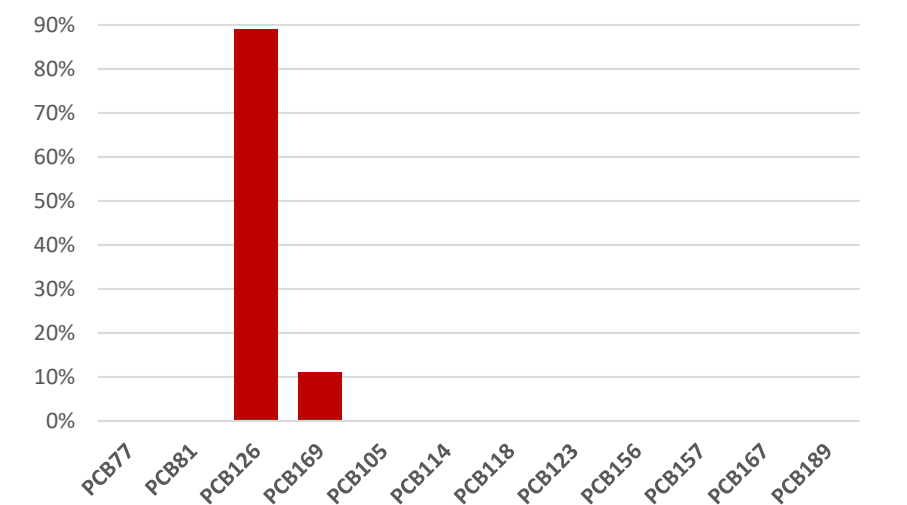
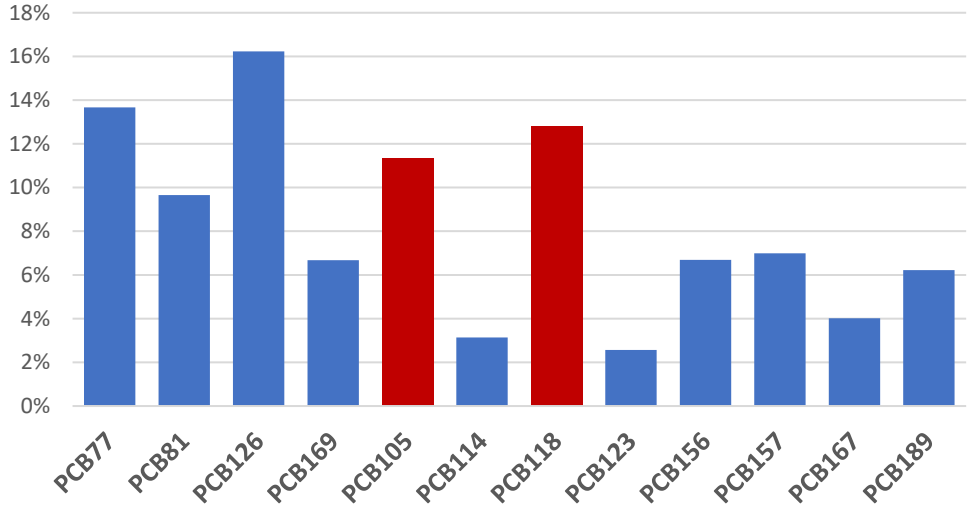
Fraction of total DL-PCB (%)



Fraction of TEQ DL-PCB (%)



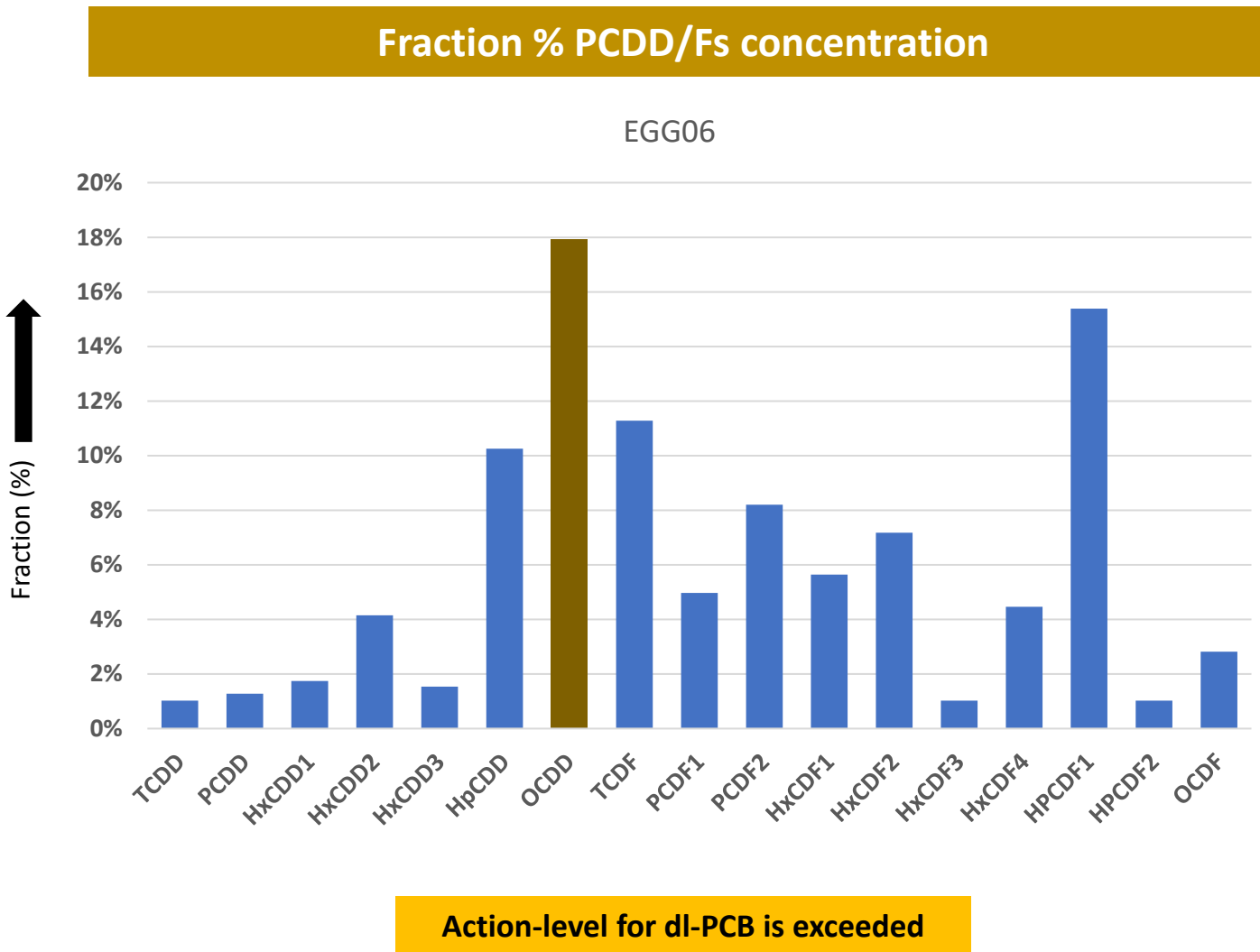
Incinerator PCB pattern (REC NL)



Egg location 6

Pilsen Czech Rep. - 2021

| | |
|---------------------|---------------|
| TW-REF-NR | TW-CZ21-Egg06 |
| Sample date | 28/07/2021 |
| Distance | 4670 |
| N hens | 22 |
| N rooster | 1 |
| Age | 48 mnd |
| Eggs/month | 390 |
| Area m2 | 84 |
| Outdoor fireplace | no |
| Wood burning stove | regular |
| Pesticides use | not |
| Industry nearby | not |
| Highway nearby | no |
| DR CALUX BEQ | |
| PCDD/F | 2.50 |
| dl-PCB | 5.30 |
| PCDD/F/dl-PCB | 7.80 |
| GC-MS TEQ | |
| PCDD/F | 1.70 |
| dl-PCB | 7.40 |
| PCDD/F/dl-PCB | 9.20 |



DR CALUX PCDD/F and PCDD/F/dl/PCB are suspect

NOT Complying with EU limit of PCDD/F and the sum of PCDD/F/dl-PCBs TEQ.

Egg location 6

Pilsen Czech Rep. - 2021

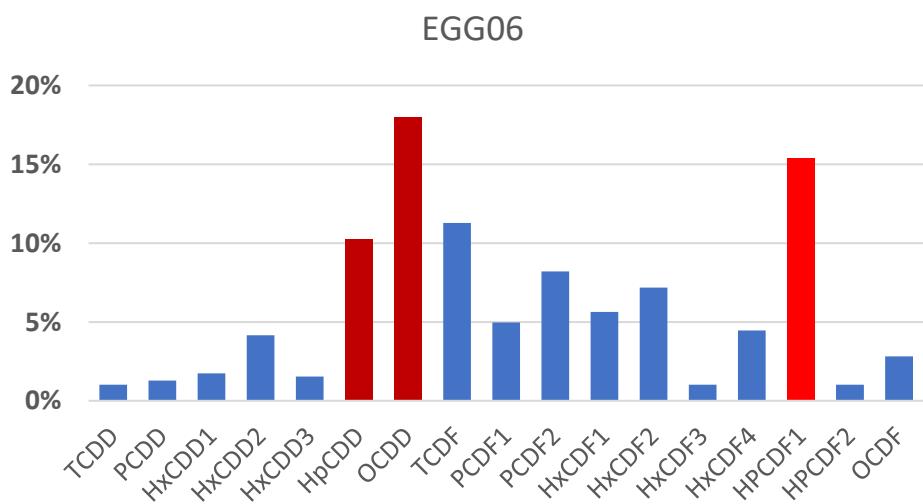
| | |
|---------------|---------------|
| TW-REF-NR | TW-CZ21-Egg06 |
| Sample date | 28/07/2021 |
| Distance | 4670 |
| N hens | 22 |
| Age | 48 mnd |
| Eggs/month | 390 |
| DR CALUX BEQ | |
| PCDD/F BEQ | 2.50 |
| dl-PCB | 5.30 |
| PCDD/F/dl-PCB | 7.80 |
| GC-MS TEQ | |
| PCDD/F BEQ | 1.70 |
| dl-PCB | 7.40 |
| PCDD/F/dl-PCB | 9.20 |

Exceeding limit PCDD/F and PCDD/F/dl/PCB with DR CALUX bioassay

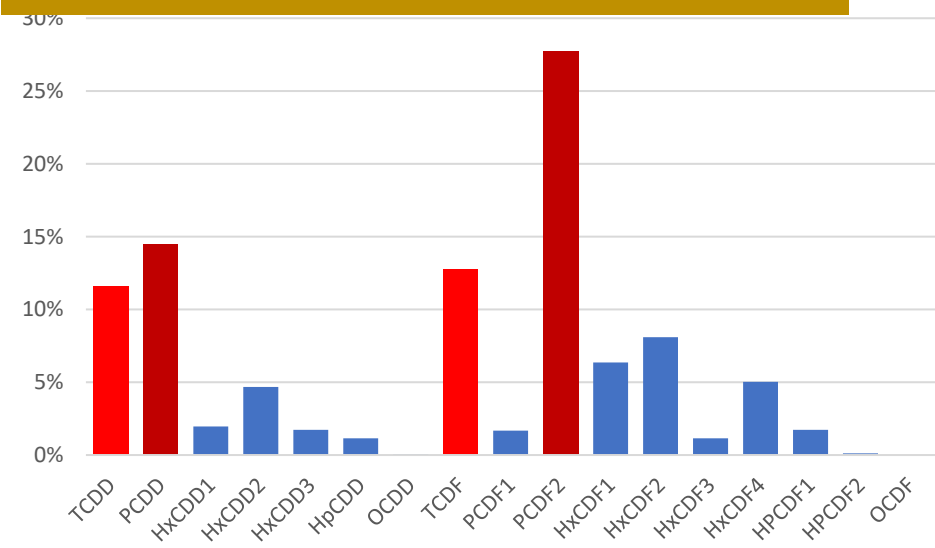
Action-level for dl-PCB

NOT Complying with EU limit of PCDD/F and the sum of PCDD/F/dl-PCBs TEQ.

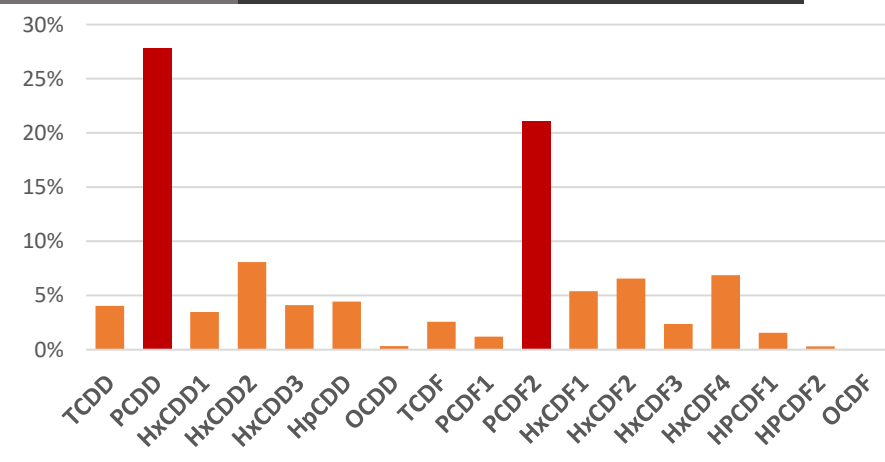
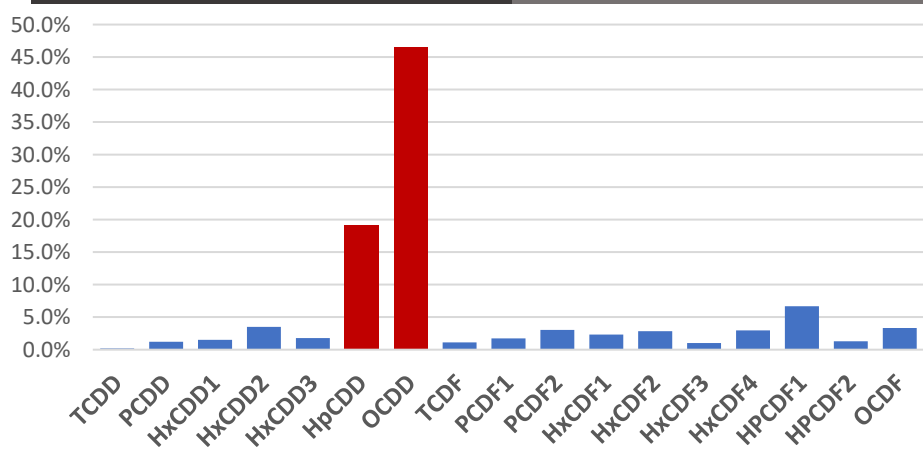
Fraction of total (%)



Fraction of total TEQ (%)



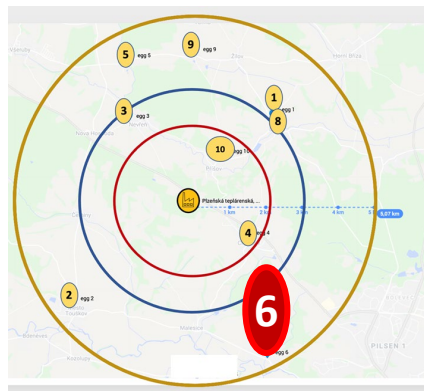
Fraction of total (%) Incinerator REC NL (20,000 hrs) Fraction of total TEQ (%)



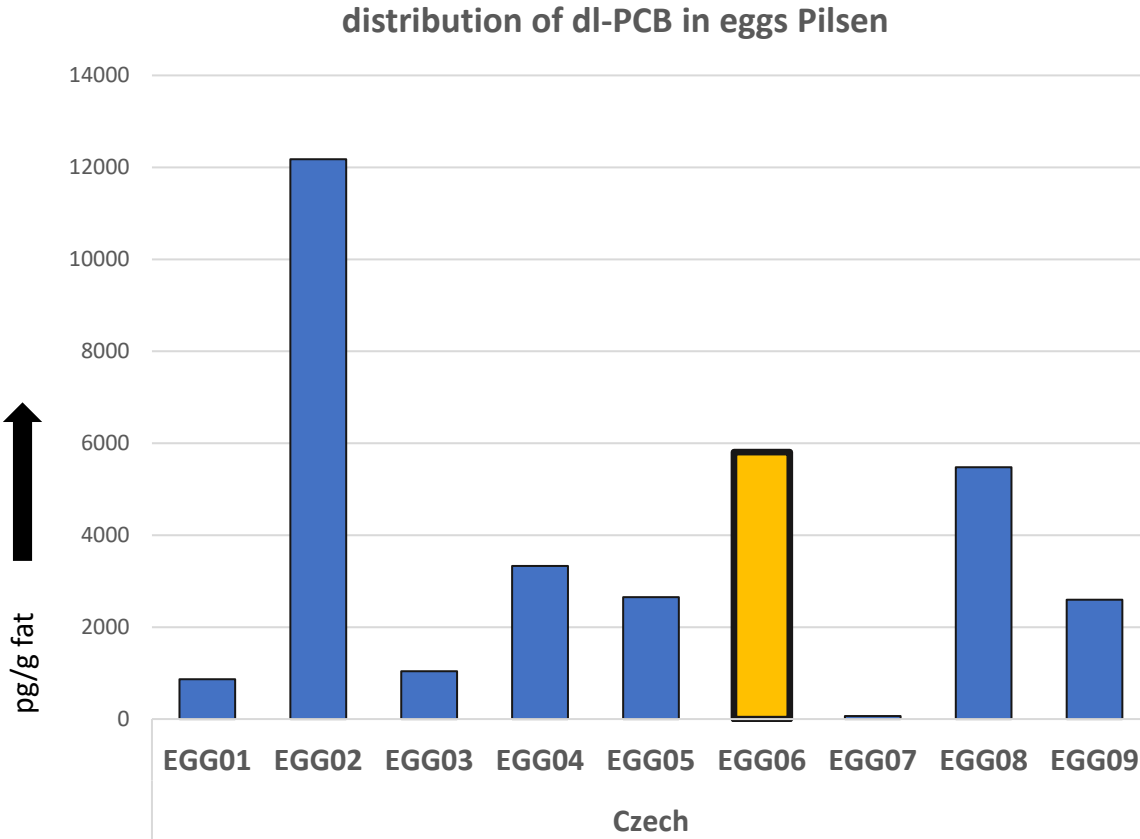
Egg location 6

Pilsen Czech Rep. - 2021

| | |
|---------------------|---------------|
| TW-REF-NR | TW-CZ21-Egg06 |
| Sample date | 28/07/2021 |
| Distance | 4670 |
| N hens | 22 |
| Age | 48 mnd |
| Eggs/month | 390 |
| DR CALUX BEQ | |
| PCDD/F BEQ | 2.50 |
| dl-PCB | 5.30 |
| PCDD/F/dl-PCB | 7.80 |
| GC-MS TEQ | |
| PCDD/F BEQ | 1.70 |
| dl-PCB | 7.40 |
| PCDD/F/dl-PCB | 9.20 |



| TW-CZ21-Egg06 | |
|---------------|--------|
| pg/g fat | Egg-06 |
| PCB77 | 40 |
| PCB81 | 4 |
| PCB126 | 69 |
| PCB169 | 12 |
| PCB105 | 530 |
| PCB114 | 20 |
| PCB118 | 2600 |
| PCB123 | < 2 |
| PCB156 | 1600 |
| PCB157 | 120 |
| PCB167 | 550 |
| PCB189 | 260 |
| dl-PCB sum | 5807 |
| dl-PCB TEQ | 7.40 |



dl-PCB: 5806.90 pg/g fat = 7.40 pg TEQ/g fat

Action-level for dl-PCB is exceeded

NOT Complying with EU limit of PCDD/F and the sum of PCDD/F/dl-PCBs TEQ.

DR CALUX PCDD/F and PCDD/F/dl/PCB are suspect



Egg location 8

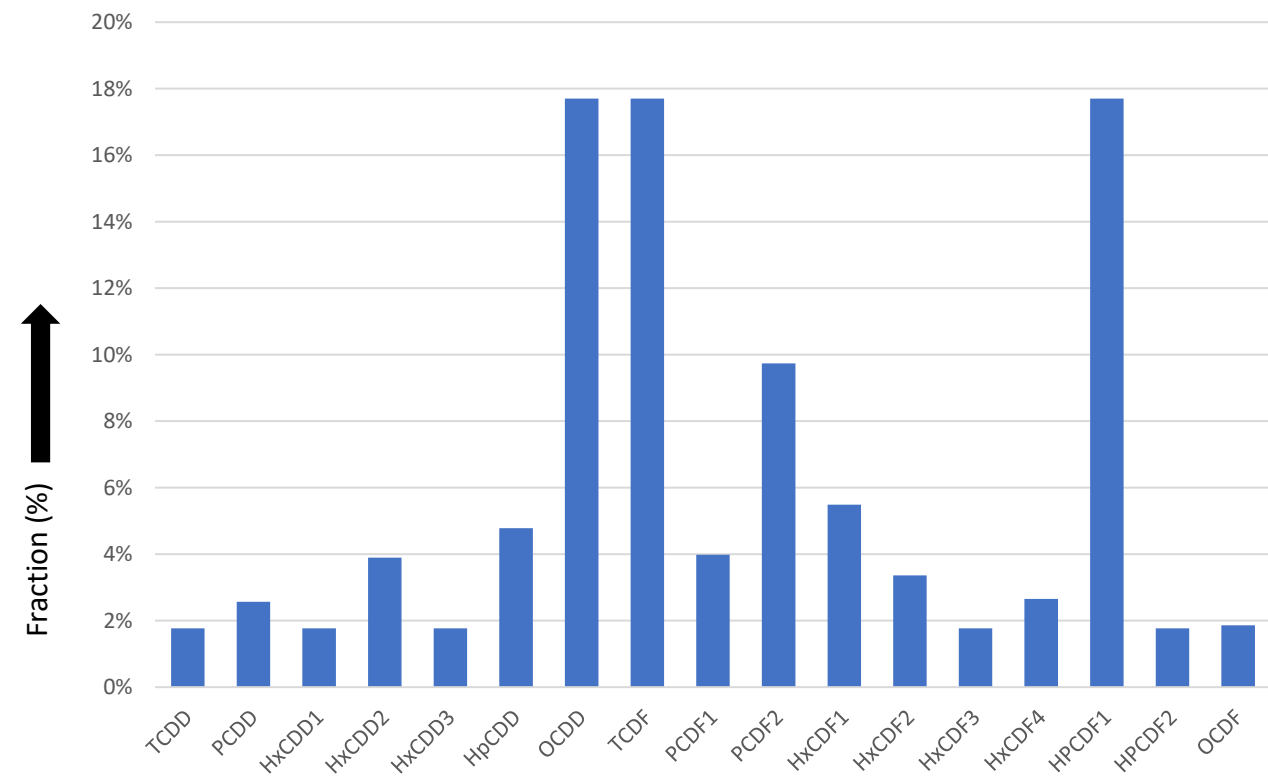
Pilsen Czech Rep. - 2021

| | |
|--------------------|---------------|
| TW-REF-NR | TW-CZ21-Egg08 |
| Sample date | 28/07/2021 |
| Distance | 3290 |
| N hens | 35 |
| N rooster | 3 |
| Age | 24 mnd |
| Eggs/month | 600 |
| Area m2 | 30 |
| Outdoor fireplace | no |
| Wood burning stove | regular |
| Pesticides use | not |
| Industry nearby | no |
| Highway nearby | no |

| | |
|---------------------|-------------|
| DR CALUX BEQ | |
| PCDD/F | 2.10 |
| dl-PCB | 7.70 |
| PCDD/F/dl-PCB | 9.80 |
| GC-MS TEQ | |
| PCDD/F | 1.30 |
| dl-PCB | 8.40 |
| PCDD/F/dl-PCB | 9.70 |

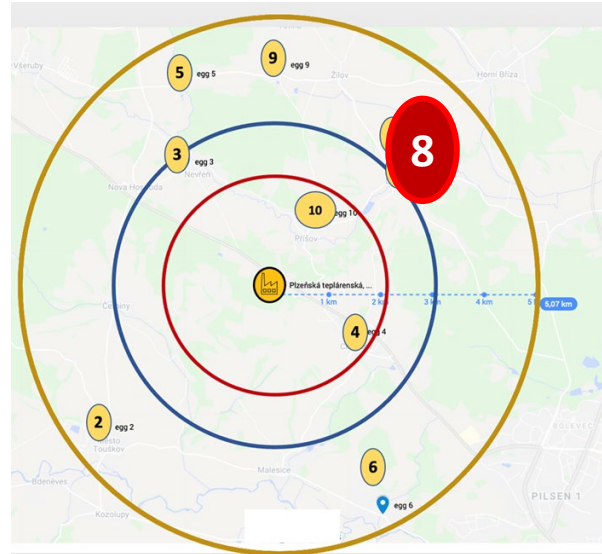
DR CALUX PCDD/F and PCDD/F/dl/PCB are suspect

Fraction % PCDD/Fs concentration



Action-level for dl-PCB is exceeded

NOT Complying with EU limit of the sum of PCDD/F/dl-PCBs TEQ.



Egg location 8

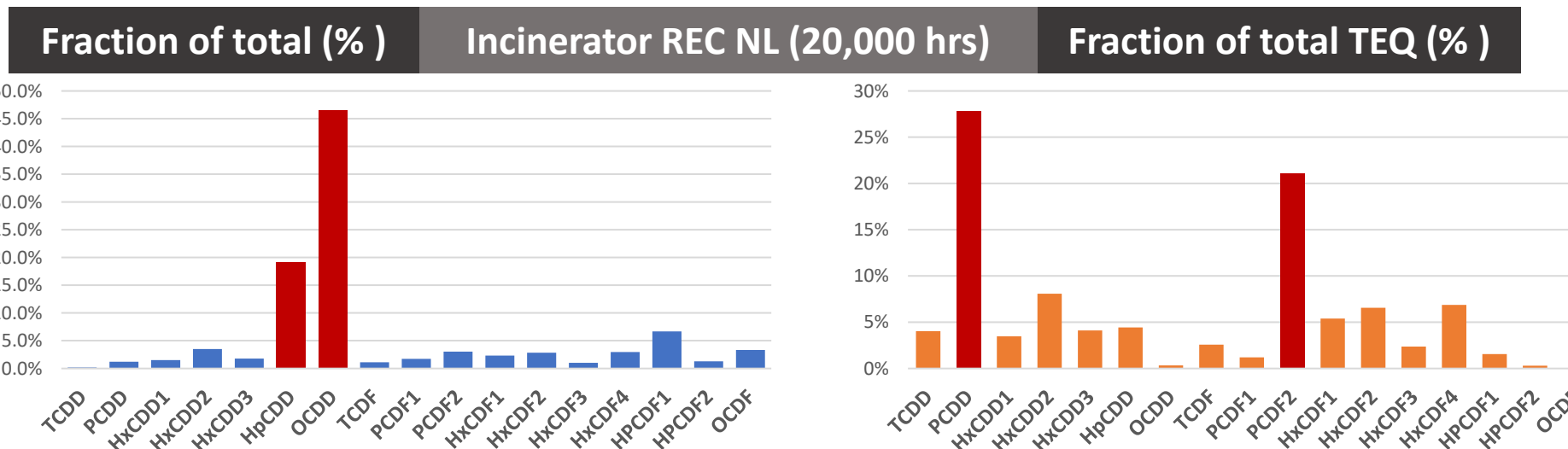
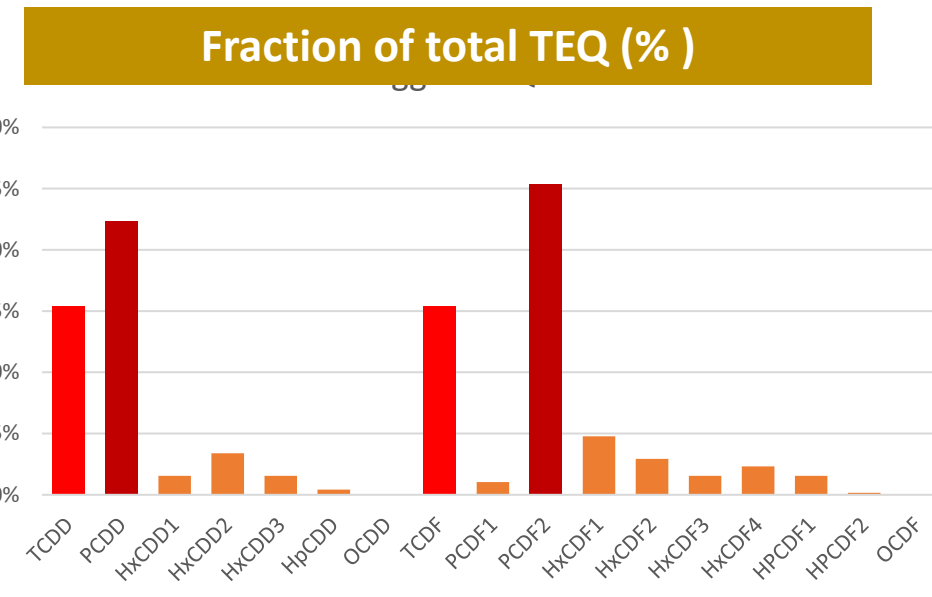
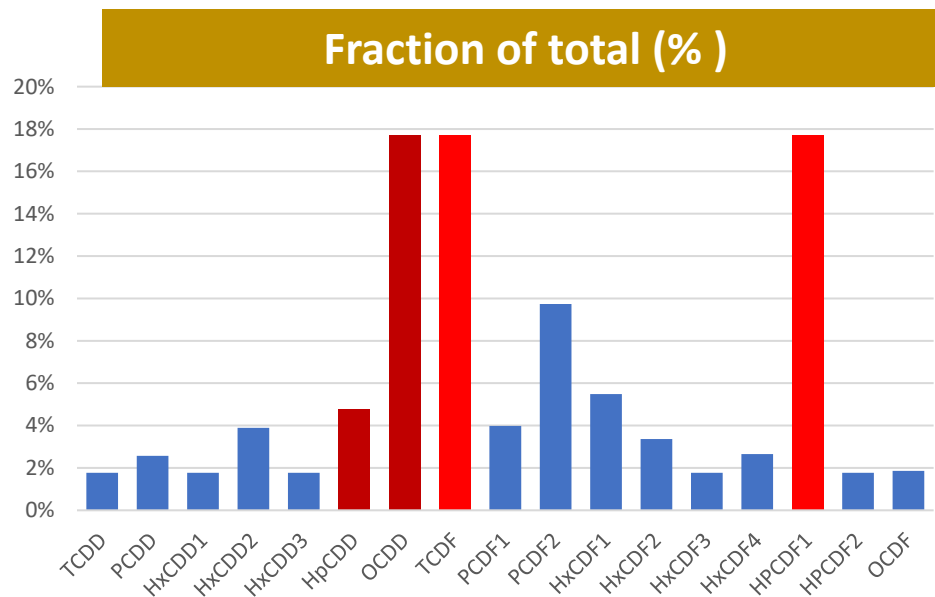
Pilsen Czech Rep. - 2021

| | |
|---------------|---------------|
| TW-REF-NR | TW-CZ21-Egg08 |
| Sample date | 28/07/2021 |
| Distance | 3290 |
| N hens | 35 |
| Age | 24 mnd |
| Eggs/month | 600 |
| DR CALUX BEQ | |
| PCDD/F BEQ | 2.10 |
| dI-PCB | 7.70 |
| PCDD/F/dI-PCB | 9.80 |
| GC-MS TEQ | |
| PCDD/F BEQ | 1.30 |
| dI-PCB | 8.40 |
| PCDD/F/dI-PCB | 9.70 |

Exceeding limit PCDD/F and PCDD/F/dI/PCB with DR CALUX bioassay

Action-level dI-PCB

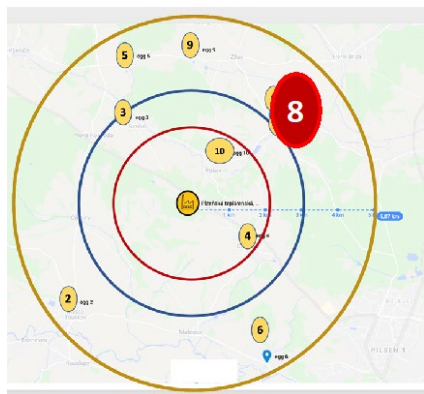
NOT Complying with EU limit of the sum of PCDD/F/dI-PCBs TEQ.



Egg location 8

Pilsen Czech Rep. - 2021

| | |
|---------------------|---------------|
| TW-REF-NR | TW-CZ21-Egg08 |
| Sample date | 28/07/2021 |
| Distance | 3290 |
| N hens | 35 |
| Age | 24 mnd |
| Eggs/month | 600 |
| DR CALUX BEQ | |
| PCDD/F BEQ | 2.10 |
| dl-PCB | 7.70 |
| PCDD/F/dl-PCB | 9.80 |
| GC-MS TEQ | |
| PCDD/F BEQ | 1.30 |
| dl-PCB | 8.40 |
| PCDD/F/dl-PCB | 9.70 |

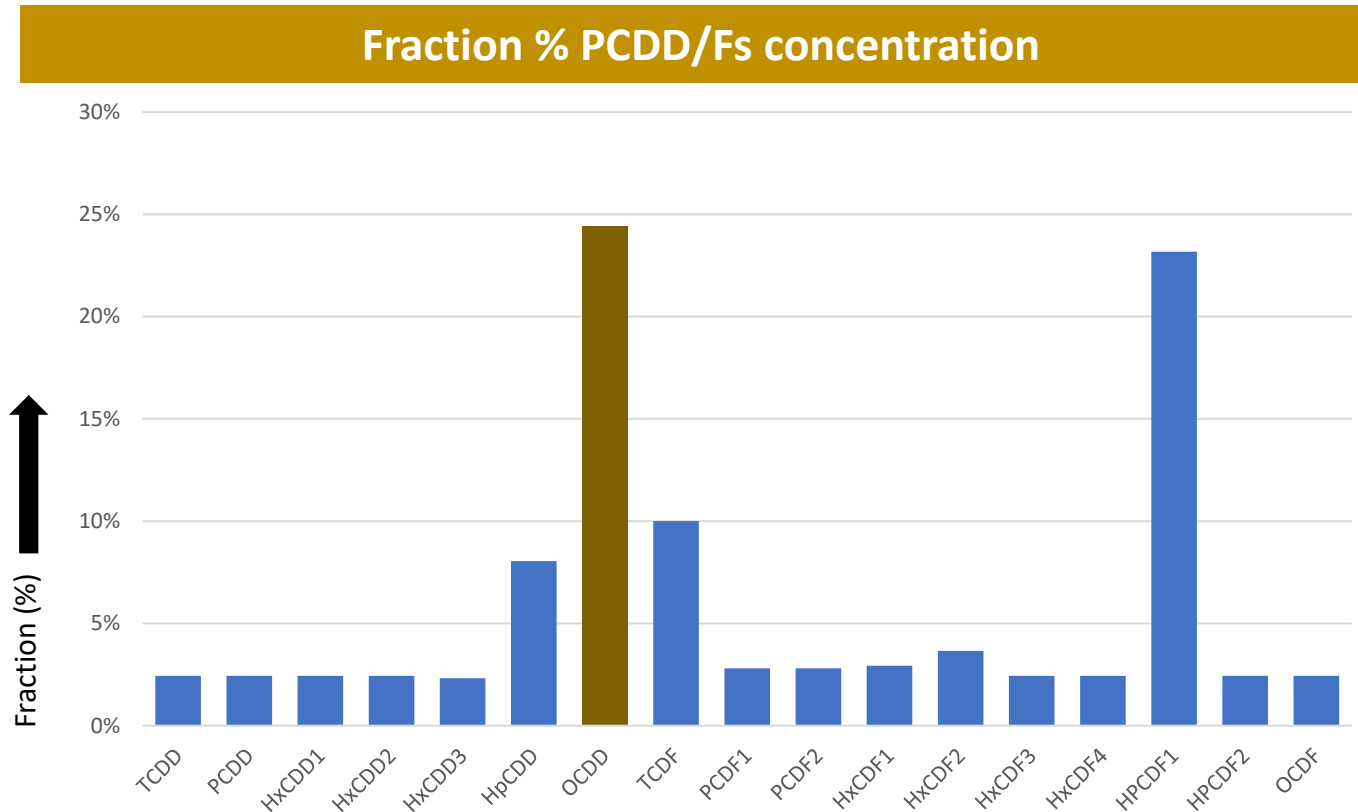


Egg location 9

Pilsen Czech Rep. - 2021

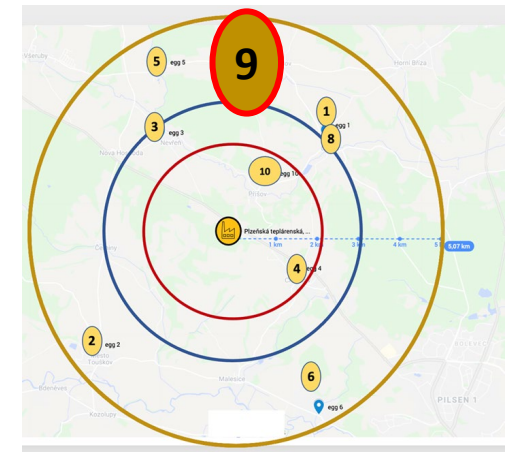
| | |
|---------------------|---------------|
| TW-REF-NR | TW-CZ21-Egg09 |
| Sample date | 28/07/2021 |
| Distance | 4260 |
| N hens | 20 |
| N rooster | - |
| Age | 12-36 mnd |
| Eggs/month | 450 |
| Area m2 | 300 |
| Outdoor fireplace | no |
| Wood burning stove | not |
| Pesticides use | no |
| Industry nearby | no |
| Highway nearby | no |
| DR CALUX BEQ | |
| PCDD/F | 0.66 |
| dl-PCB | 2.74 |
| PCDD/F/dl-PCB | 3.40 |
| GC-MS TEQ | |
| PCDD/F | 0.74 |
| dl-PCB | 2.80 |
| PCDD/F/dl-PCB | 3.50 |

DR CALUX PCDD/F/dl/PCB
Is suspect



Action-level for dl-PCB is exceeded

GC-MS analysis complies with EU limit of dioxins in food



Egg location 9

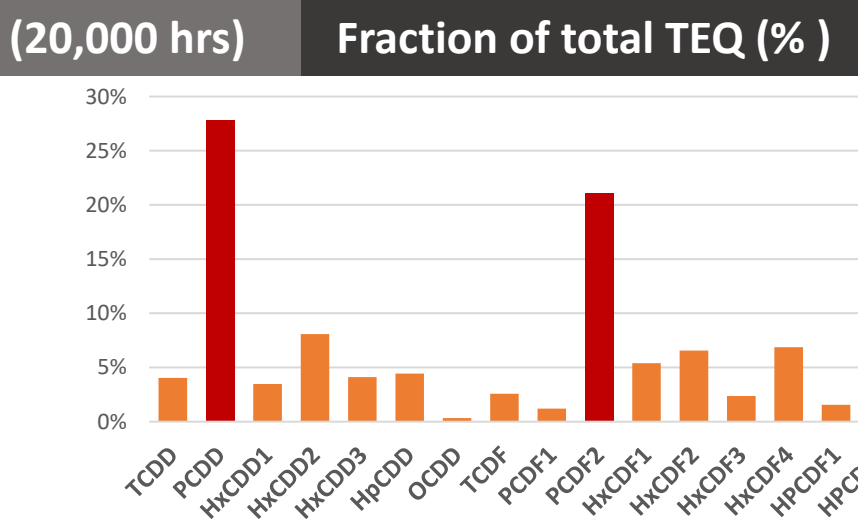
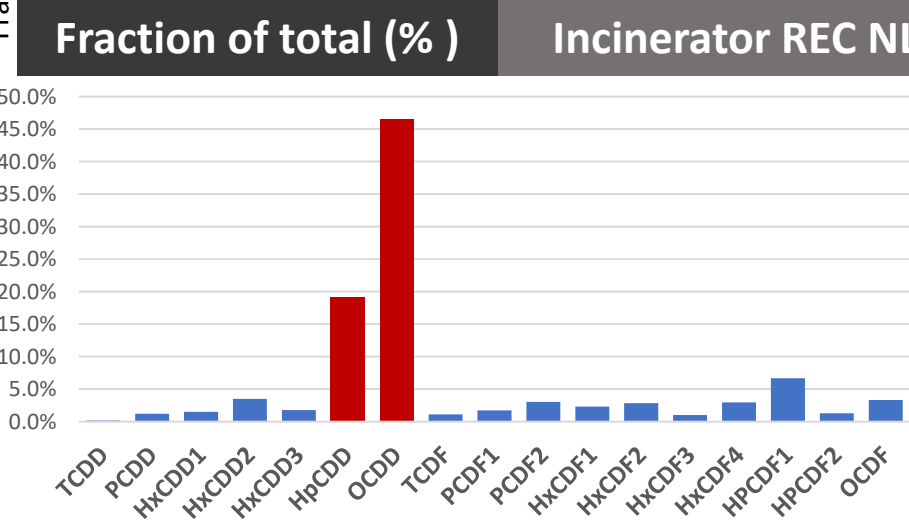
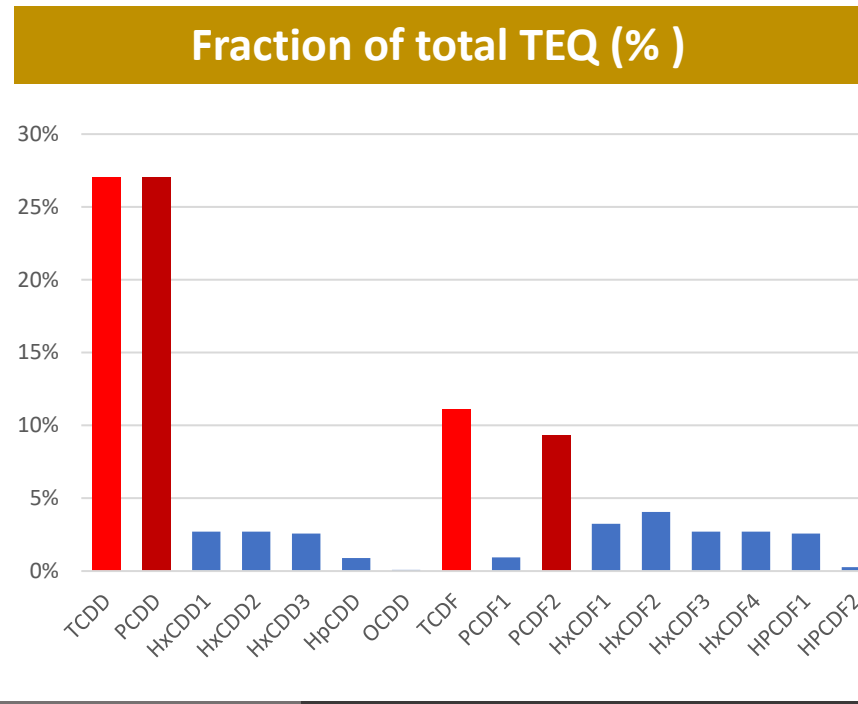
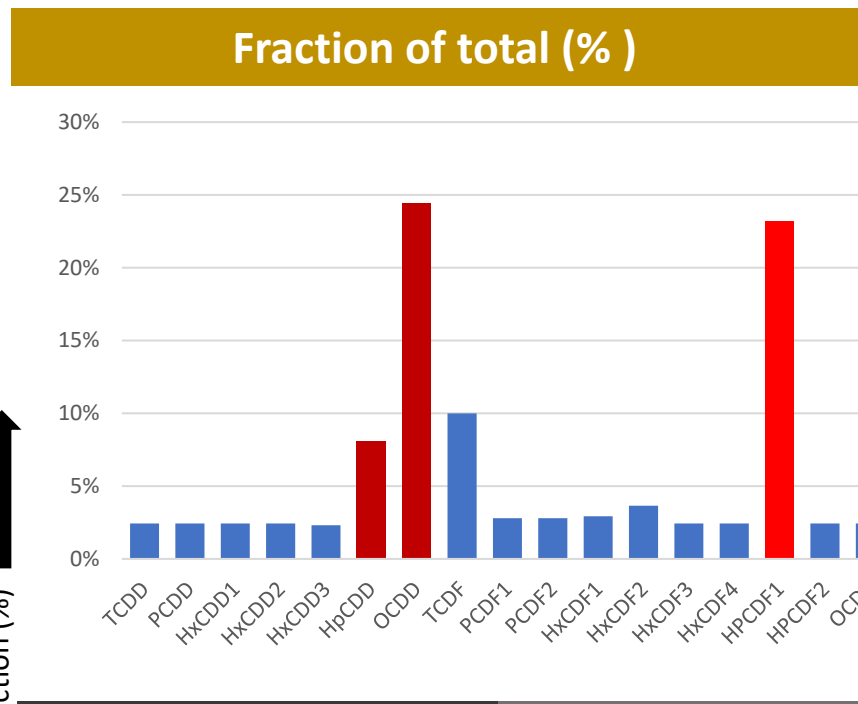
Pilsen Czech Rep. - 2021

| | |
|---------------|---------------|
| TW-REF-NR | TW-CZ21-Egg09 |
| Sample date | 28/07/2021 |
| Distance | 4260 |
| N hens | 20 |
| Age | 12-36 mnd |
| Eggs/month | 450 |
| DR CALUX BEQ | |
| PCDD/F BEQ | 0.66 |
| dl-PCB | 2.74 |
| PCDD/F/dl-PCB | 3.40 |
| GC-MS TEQ | |
| PCDD/F BEQ | 0.74 |
| dl-PCB | 2.80 |
| PCDD/F/dl-PCB | 3.50 |

Exceeding limit PCDD/F with DR CALUX bioassay

Action-level for dl-PCB

GC-MS analysis complies with EU limit of dioxins in eggs

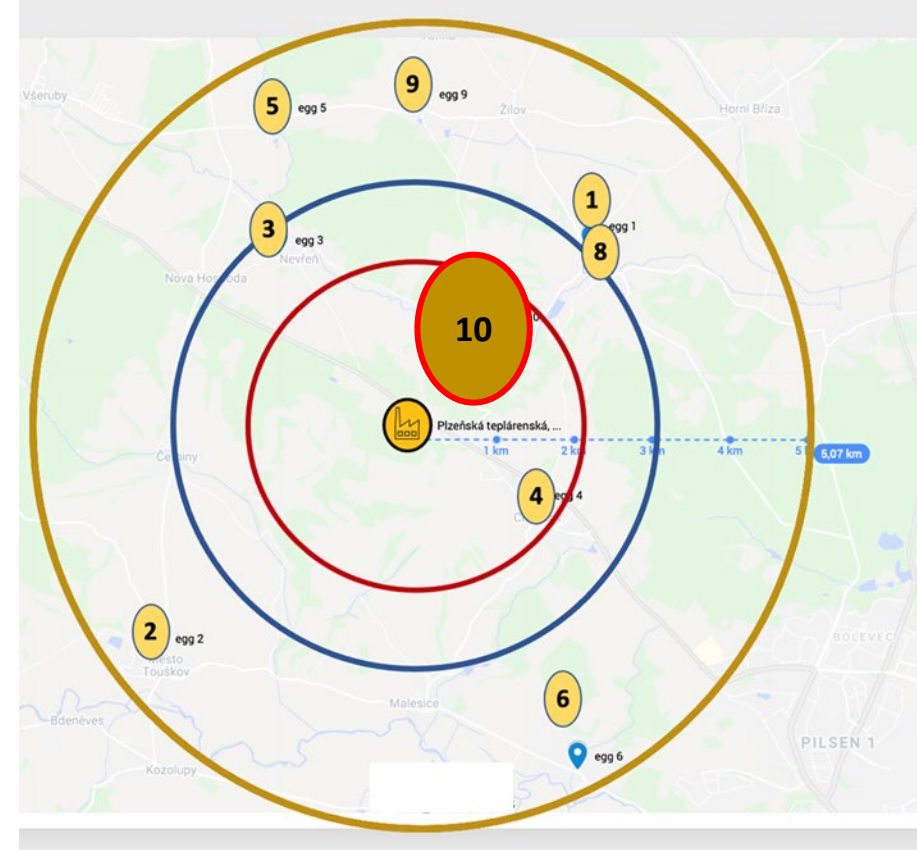


Egg location 10

Pilsen Czech Rep. - 2021

| | |
|---------------|---------------|
| TW-REF-NR | TW-CZ21-Egg10 |
| Sample date | 28/07/2021 |
| Distance | 1630 |
| N hens | 6 |
| Age | 6 mnd |
| Eggs/month | 120 |
| DR CALUX BEQ | |
| PCDD/F BEQ | 0.41 |
| dl-PCB | 0.54 |
| PCDD/F/dl-PCB | 0.95 |
| GC-MS TEQ | |
| PCDD/F BEQ | |
| dl-PCB | |
| PCDD/F/dl-PCB | |

DR CALUX analysis complies with EU limit of dioxins in eggs

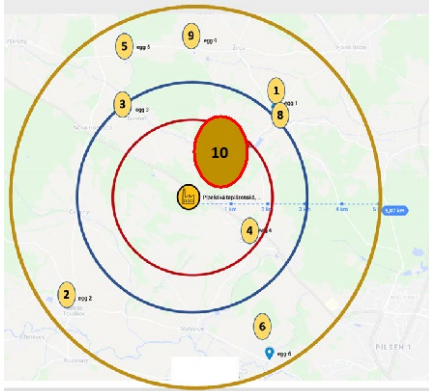


Breed is Sussex and Isa Brown

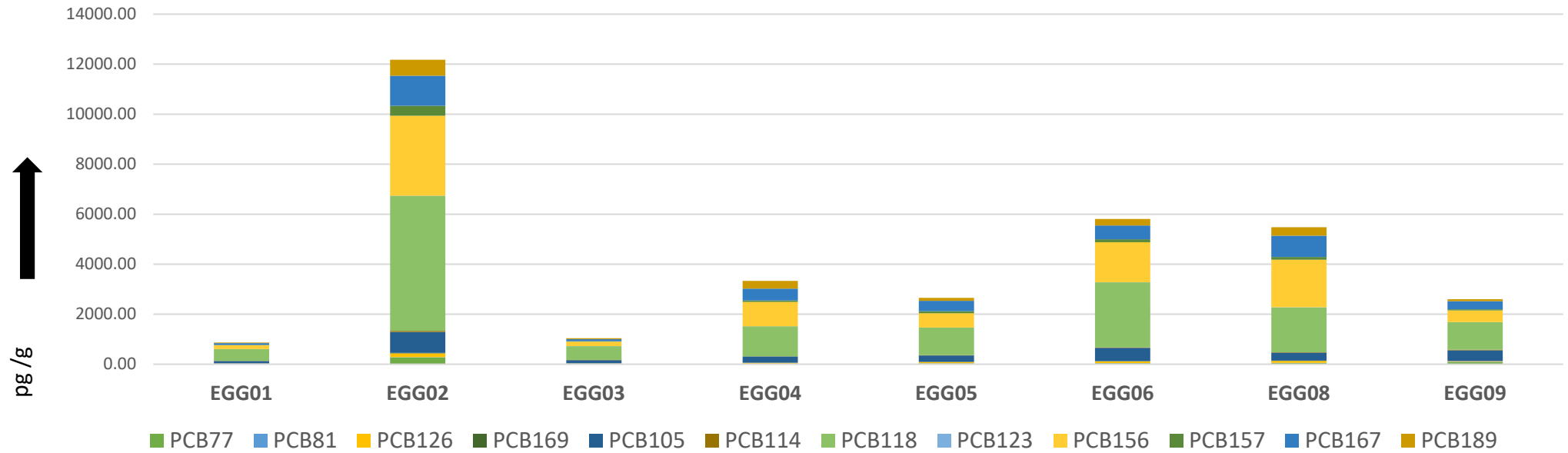
Egg location 10

Pilsen Czech Rep. - 2021

| | |
|---------------|---------------|
| TW-REF-NR | TW-CZ21-Egg10 |
| Sample date | 28/07/2021 |
| Distance | 1630 |
| N hens | 6 |
| Age | 6 mnd |
| Eggs/month | 120 |
| DR CALUX BEQ | |
| PCDD/F BEQ | 0.41 |
| dI-PCB | 0.54 |
| PCDD/F/dI-PCB | 0.95 |
| GC-MS TEQ | |
| PCDD/F BEQ | |
| dI-PCB | |
| PCDD/F/dI-PCB | |



Distribution of dl-PCB Pilsen Czech Rep. 2021

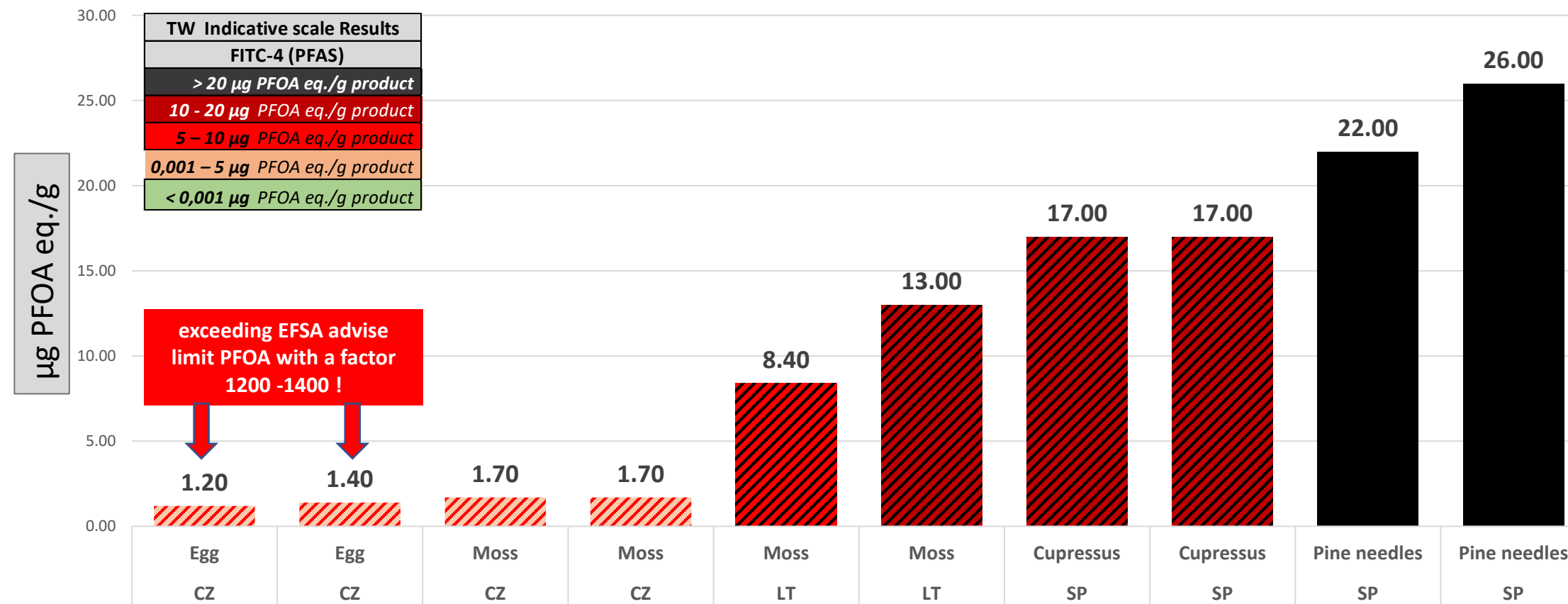


| % individual congeners dl-PCB eggs, Pilsen Czech 2021 | | | | | | | | | | | | |
|---|-------|-------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| TW-CZ21 | PCB77 | PCB81 | PCB126 | PCB169 | PCB105 | PCB114 | PCB118 | PCB123 | PCB156 | PCB157 | PCB167 | PCB189 |
| Egg01 | 1% | 0% | 1% | 0% | 12% | 1% | 54% | 0% | 17% | 2% | 8% | 3% |
| Egg02 | 2% | 0% | 1% | 0% | 7% | 0% | 44% | 0% | 26% | 3% | 10% | 5% |
| Egg03 | 1% | 1% | 1% | 0% | 12% | 1% | 53% | 0% | 17% | 2% | 7% | 4% |
| Egg04 | 1% | 0% | 1% | 0% | 8% | 0% | 36% | 0% | 29% | 2% | 14% | 9% |
| Egg05 | 1% | 0% | 2% | 1% | 9% | 1% | 41% | 0% | 21% | 3% | 15% | 5% |
| Egg06 | 1% | 0% | 1% | 0% | 9% | 0% | 45% | 0% | 28% | 2% | 9% | 4% |
| Egg07 | 9% | 3% | 1% | 0% | 16% | 3% | 46% | 3% | 8% | 3% | 5% | 3% |
| Egg08 | 1% | 0% | 1% | 0% | 6% | 0% | 33% | 0% | 35% | 2% | 16% | 6% |
| Egg09 | 3% | 0% | 1% | 0% | 17% | 1% | 44% | 0% | 19% | 2% | 13% | 3% |

TW Indicative scale PFAS (μg PFOA eq./g product) in divers biomatrices, Europe - 2021

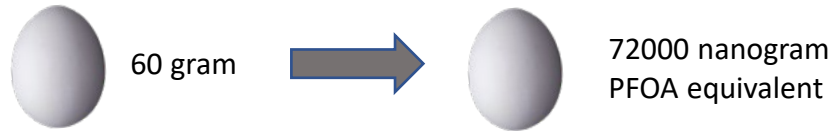


PFAS (FITC-T4)



PFAS eggs Pilsen Czech Rep. 2021

| EGG02 | | |
|----------------|-----------------------|---------|
| PFAS CALUX | ng PFOA eq./g product | 250.00 |
| PFAS (FITC-T4) | ng PFOA eq./g product | 1200.00 |



EFSA: Tolerable Weekly Intake (TWI) for PFOA is 6 ng PFOA/kg bodyweight.

TWI adult 70 kg is 420 ng PFOA/week



one egg a day = 7 x 72000 =

504000 ng PFOA a week

exceeding the EFSA limit PFOA with a factor 1200-1400 !

What about our immune system?

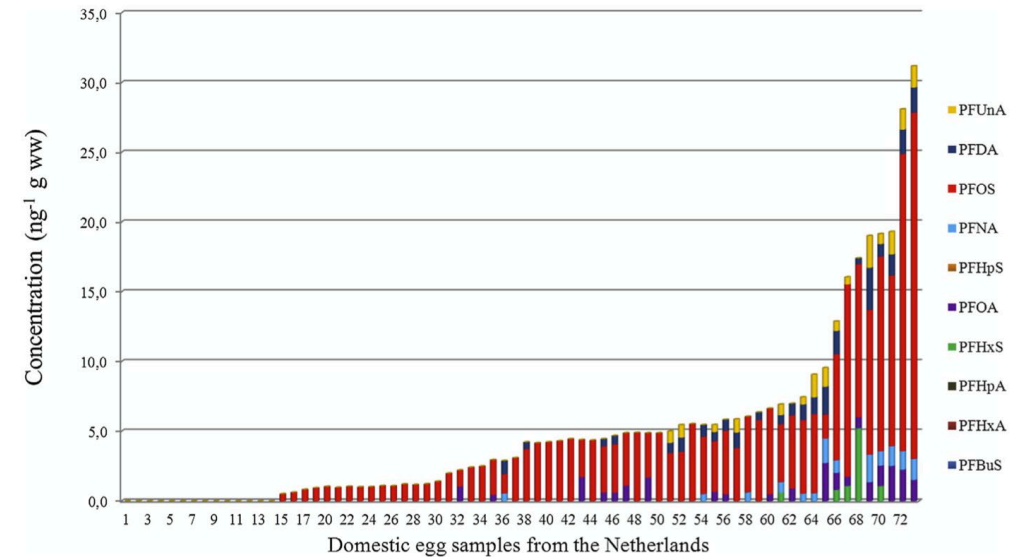


Fig. 2. Concentrations of individual PFASs (ng/g ww) in yolk samples from home produced eggs from the Netherlands. In samples where no data are presented, all levels were below the LOQ. The samples have been presented in increasing PFASs level order.

Zafeiraki et al, 2016 Perfluoroalkylated substances (PFASs) in home and commercially produced chicken eggs from the Netherlands and Greece, Chemosphere 144 2106–2112

In the Netherlands with chemical analyses GC-MS less than 2 ng PFOA found in eggs (2016)

The results in the graph are performed by chemical analyses, measured in 1-2 ng.

TW use bioassay PFAS CALUX and FITC-T4 methods for analyses of the eggs in this biomonitoring research with measurements in PFOA equivalents (eq.). The results in this research show a lot of PFAS with PFOA toxicity, presumably because of the PFAS CALUX and FITC-T4 method.

The results in the graph are performed by chemical analyses, measured in 1-2 ng.

TW use bioassay PFAS CALUX and FITC-T4 methods for analyses of the eggs in this biomonitoring research with measurements in PFOA equivalents (eq.). The results in this research show a lot of PFAS with PFOA toxicity, presumably because of the PFAS CALUX and FITC-T4 method.

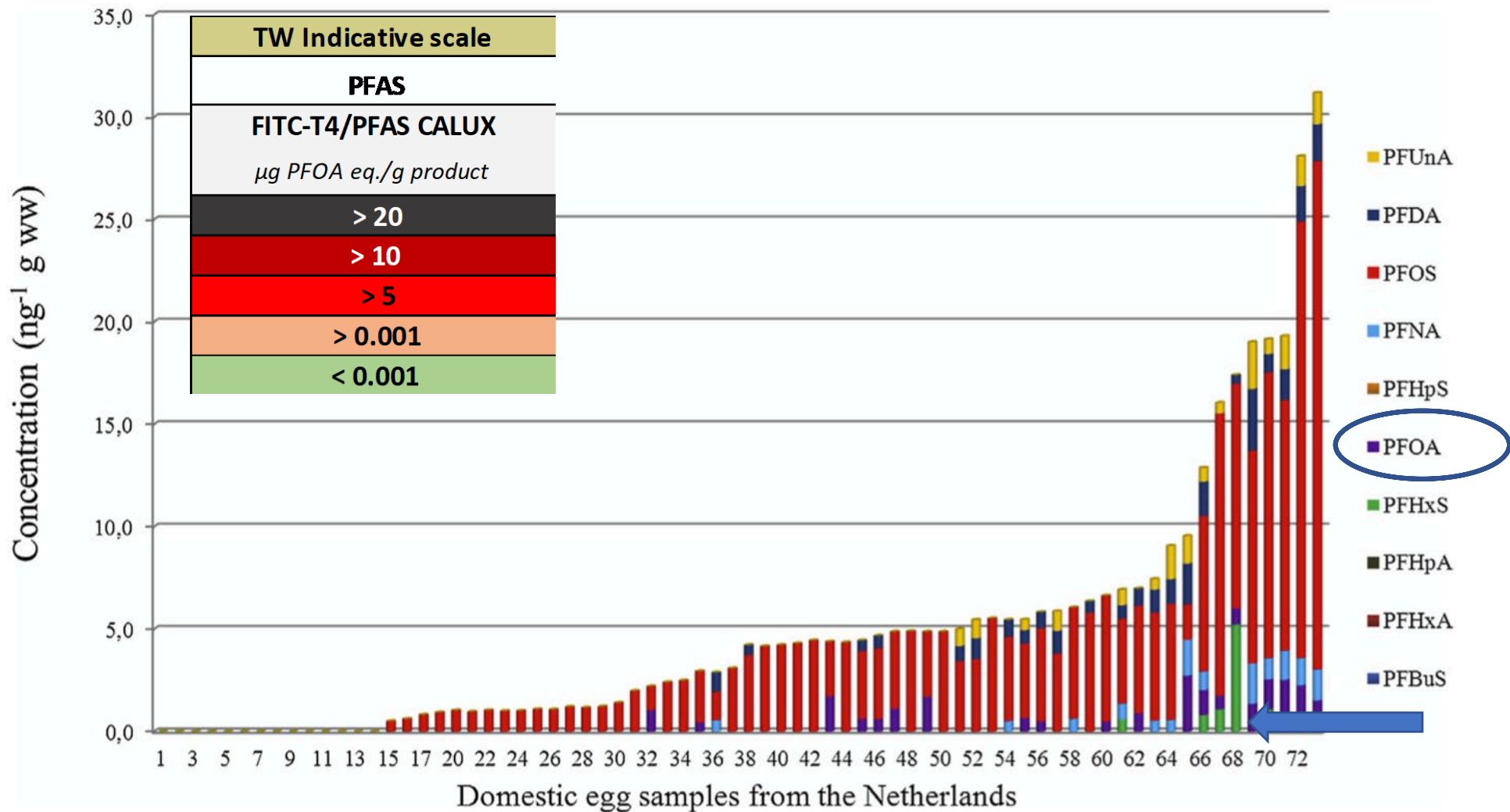


Fig. 2. Concentrations of individual PFASs (ng/g ww) in yolk samples from home produced eggs from the Netherlands. In samples where no data are presented, all levels were below the LOQ. The samples have been presented in increasing PFASs level order.

Results biomonitoring - Pilsen, Czech Rep. 2021



DR CALUX: Factor 3 elevate dioxins (PCDD/F) in pine needles



PAH CALUX : Factor 87x elevate *ng B[a]P eq. /g product* in pine needles



DR CALUX: Factor 7x more dioxins (PCDD/F) in mosses



FITC-T4: High levels of PFAS in mosses



DR CALUX: 89% of the eggs does not comply EU limit bioassay for dioxins

GC-MS: 50 % of the eggs does not comply the EU limit for safe egg consumption

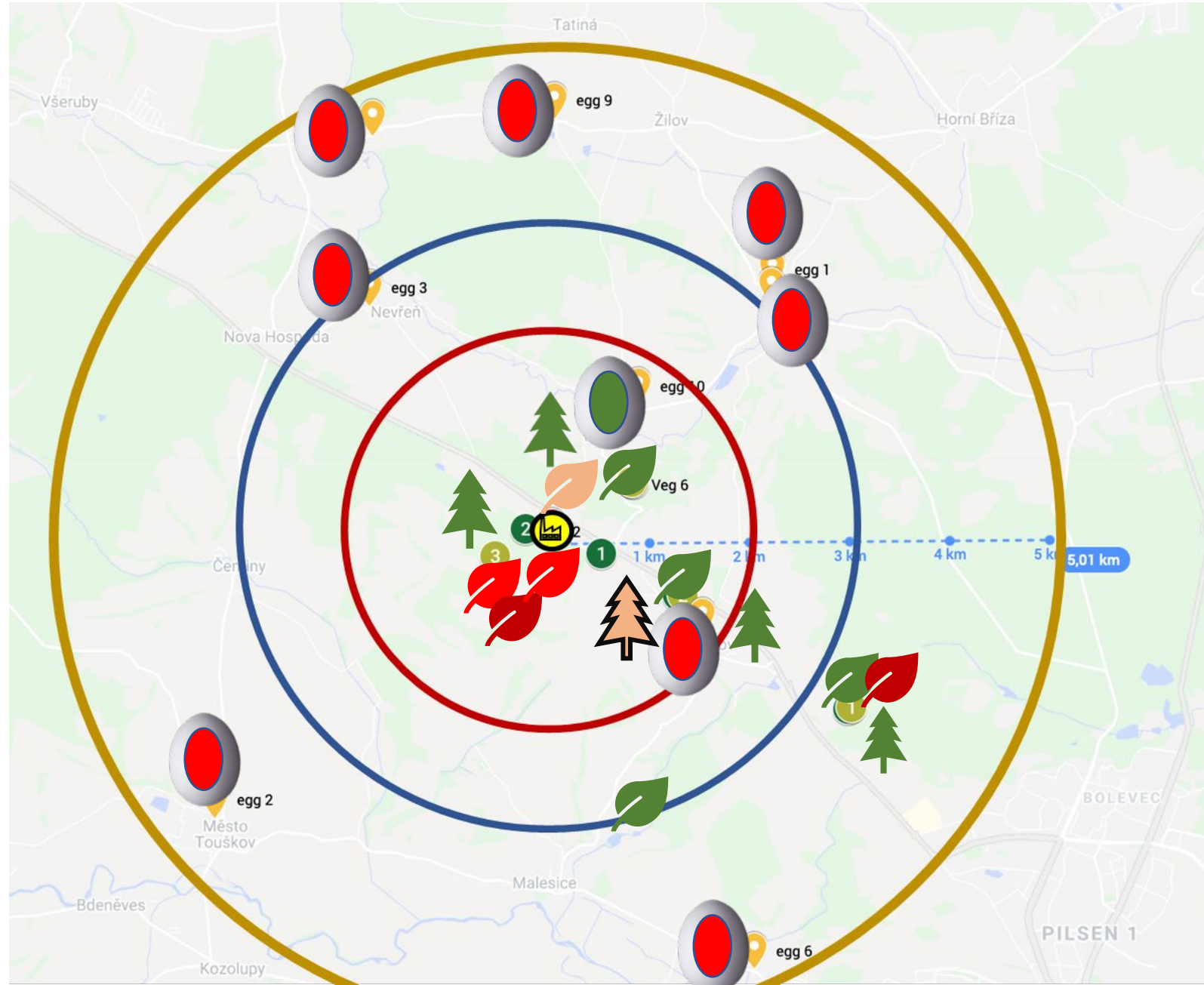
GC-MS: 75 % of the eggs breaches the EU action limit for dl-PCB

GC-MS: 38 % of the eggs breaches the EU action limit for PCDD/F



PFAS CALUX : High levels of PFAS in eggs

GC-MS: Congener patterns dioxins are the same as those from a waste incinerator



| TW indicative scale vegetation | | | TW Indicative scale | TW Indicative scale | EU limit - Eggs | | EU limit - Eggs | EU limit - Eggs | EU limit - Eggs |
|--|--|--|--|---|---------------------------------|--------|------------------------------|------------------------------|------------------------------|
| PCDD/F/dl-PCB | PCDD/F | dL-PCB | PFAS | PAH | PCDD/F/dl-PCB | PCDD/F | PCDD/F/dl-PCB | PCDD/F | dl-PCB |
| DR CALUX <i>pg TCDD eq./g product</i> | DR CALUX <i>pg TCDD eq./g product</i> | DR CALUX <i>pg TCDD eq./g product</i> | FITC-T4/PFAS CALUX <i>µg PFOA eq./g product</i> | PAH CALUX <i>ng Benzo[a]pyrene (B[a]P) eq./g product</i> | DR CALUX <i>pg BEQ/g fat</i> | | GC-MS <i>pg TEQ/g fat</i> | GC-MS <i>pg TEQ/g fat</i> | GC-MS <i>pg TEQ/g fat</i> |
| > 5.0 | > 5.0 | > 5.0 | > 50 | > 500 | | | | | |
| > 2.0 | > 2.0 | > 2.0 | > 20 | > 250 | | | | | |
| > 1.0 | > 1.0 | > 1.0 | > 10 | > 100 | ≥ 3.3 | ≥ 1.7 | ≥ 5.0 | ≥ 2.5 | |
| > 0.5 | > 0.5 | > 0.5 | > 5 | > 10 | | | | > 1.75 | > 1.75 |
| < 0.5 | < 0.5 | < 0.5 | < 5 | < 10 | < 3.3 | < 1.7 | < 5.0 | < 1.75 | < 1.75 |

Short-term vs long-term measurements WtE

Short-term

Sampling: 0,1 % of a year



- 12 hours measurement period (2 x 6 hours)
- Only under steady state conditions
- Pre-announced
- Only PCDD/F

EU Regulatory



Long-term

Sampling: 95 % of a year



Should be EU Regulatory:

Continuous measurements in chimney WtE

Including Other Than Normal Conditions (OTNOC)

Analyses of other UPOPs (PFAS, PAH, PXDD/F)

Annex III

Vegetation locations, Pine needles & Mosses
region Pilsen, Czech Republic 2021

Dioxins (PCDD/F/dl-PCBs), PAH, PFAS emissions

Biomonitoring
Research Pilsen
Czech Republic, 2021

Vegetation
Pine needles
Mosses



ZEVO Chotikov Incinerator
incineration



Vegetation sample locations, region Pilsen, Czech Rep. - 2021



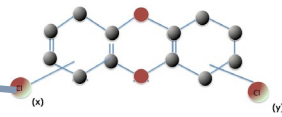
| Pine needles, Pilsen Czech rep. 2021 | | | | | |
|--------------------------------------|------|-------------------------|-----------|------------------|----------|
| CZ team location | TW | Species | sample | TW-REF-NR | Distance |
| Delivering nr | nr | | date | | (m) |
| 1 (A) | PS01 | <i>Pinus sylvestris</i> | 28-7-2021 | TW-CZ21-PS-Veg01 | 520 |
| 2 (B) | PS02 | <i>Pinus sylvestris</i> | 28-7-2021 | TW-CZ21-PS-Veg02 | 274 |
| 4 (E) | PS03 | <i>Pinus sylvestris</i> | 29-7-2021 | TW-CZ21-PS-Veg04 | 1380 |
| 5 (F) | PS04 | <i>Pinus sylvestris</i> | 29-7-2021 | TW-CZ21-PS-Veg05 | 3410 |
| 6 (D) | PS05 | <i>Pinus sylvestris</i> | 29-7-2021 | TW-CZ21-PS-Veg06 | 1000 |

Chemical analysis (GC-MS) vs Bioassay (CALUX)

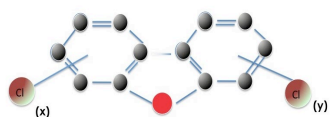
Halogen elements:

- Chlorine (Cl)
- Bromine (Br)
- Fluorine (F)
- Iodine (I)

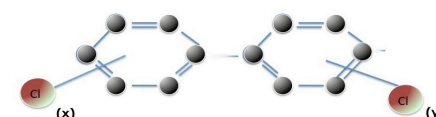
**Dioxin
PXDD**



**Furan
PXDF**

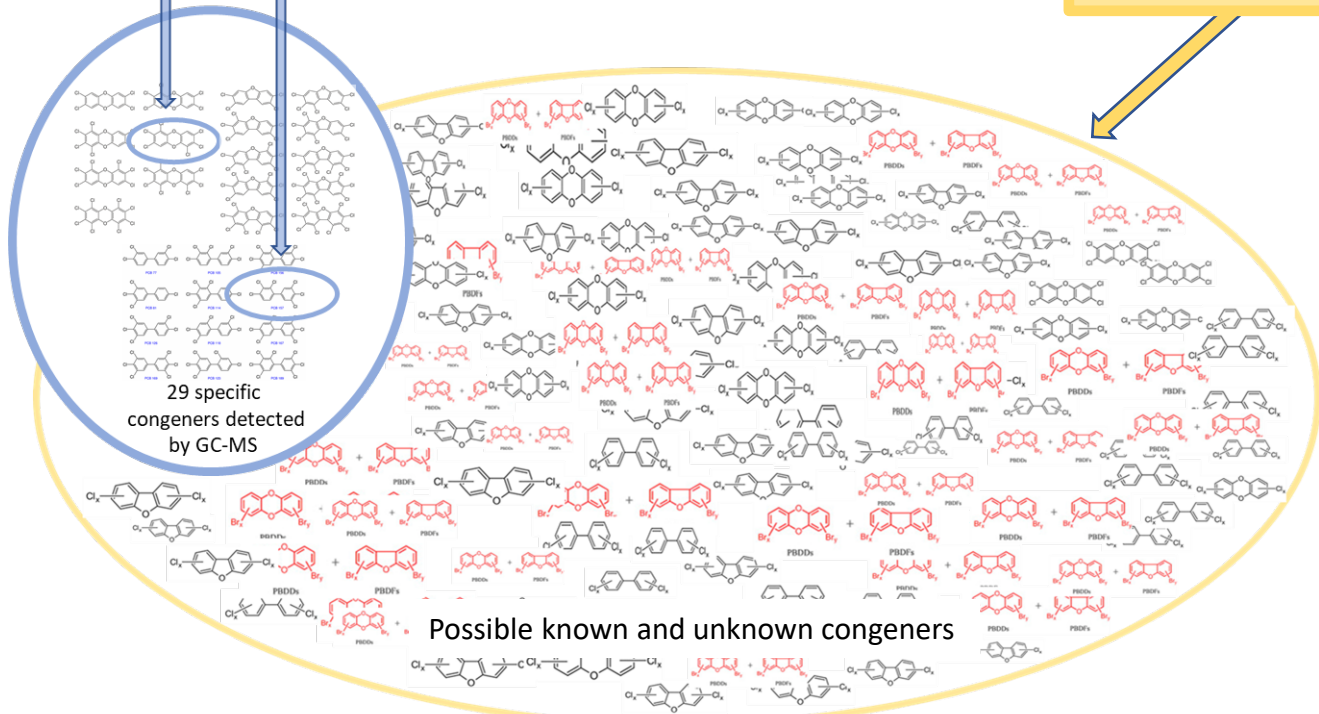


**dioxin-like Poly-X-biphenyl
dl-PXB**



GC-MS individual chemical analyses

DR CALUX, analyses of the whole group of dioxin-like activity



Chlorine can be substituted by an other halogen in dioxins, UPOP

| TW Indicative scale for Non-food DR CALUX | |
|--|-----------------------|
| > 5.0 | pg TCDD eq./g product |
| > 2.0 | pg TCDD eq./g product |
| 1.0 - 2.0 | pg TCDD eq./g product |
| 0.5 - 1.0 | pg TCDD eq./g product |
| < 0.5 | pg TCDD eq./g product |

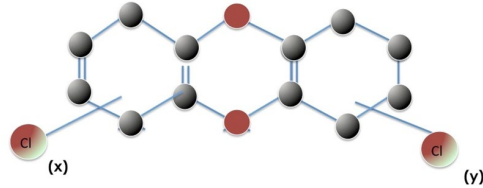
| DR CALUX Food (Eggs) | |
|----------------------|--------------------------------|
| pg BEQ / g fat | |
| ≥ 1.7 | EU Cut-off-Value PCDD/F |
| ≥ 3.3 | EU Cut-off-Value PCDD/F/dl-PCB |

GC-MS chlorinated dioxins (PCDD/F/dl-PCB)

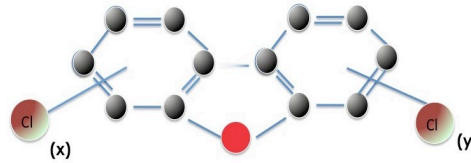
Halogen elements:

Chlorine (Cl)
Bromine (Br)
Fluorine (F)
Iodine (I)

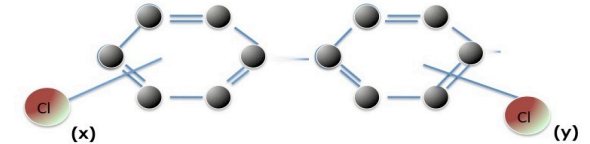
Dioxin
PCDD (75)
n = 7



Furan
PCDF (135)
n = 10



dioxin-like Polychlorobiphenyl
dl-PCB (209)
n = 12



Congeners of chlorinated compounds (chemical GC-MS analysis)

| Dioxins, furans (PCDD/F) and dioxin-like PCBs | | |
|---|---|--------|
| Abbreviation | Congeners | TEF |
| Dioxins (n=7) | | |
| TCDD | 2,3,7,8-Tetrachlorodibenzo-p-dioxin | 1 |
| PCDD | 1,2,3,7,8-Pentachlorodibenzo-p-dioxin | 1 |
| HxCDD1 | 1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin | 0,1 |
| HxCDD2 | 1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin | 0,1 |
| HxCDD3 | 1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin | 0,1 |
| HpCDD | 1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin | 0,01 |
| OCDD | Octachlorodibenzo-p-dioxin | 0,0003 |

| Furans (n=10) | | |
|---------------|---------------------------------------|--------|
| TCDF | 2,3,7,8-Tetrachlorodibenzofuran | 0,1 |
| PCDF1 | 1,2,3,7,8-Pentachlorodibenzofuran | 0,03 |
| PCDF2 | 2,3,4,7,8-Pentachlorodibenzofuran | 0,3 |
| HxCDF1 | 1,2,3,4,7,8-Hexachlorodibenzofuran | 0,1 |
| HxCDF2 | 1,2,3,6,7,8-Hexachlorodibenzofuran | 0,1 |
| HxCDF3 | 1,2,3,7,8,9-Hexachlorodibenzofuran | 0,1 |
| HxCDF4 | 2,3,4,6,7,8-Hexachlorodibenzofuran | 0,1 |
| HCDF1 | 1,2,3,4,6,7,8-Heptachlorodibenzofuran | 0,01 |
| HCDF2 | 1,2,3,4,7,8,9-Heptachlorodibenzofuran | 0,01 |
| OCDF | Octachlorodibenzofuran | 0,0003 |

| Polychlorinated biphenyl (n=12) | | |
|---------------------------------|---|---------|
| PCB77 | 3,3',4,4'-Tetrachlorobiphenyl (#77) | 0,0001 |
| PCB81 | 3,4,4',5-Tetrachlorobiphenyl (#81) | 0,0003 |
| PCB126 | 3,3',4,4',5-Pentachlorobiphenyl (#126) | 0,1 |
| PCB169 | 3,3',4,4',5,5'-Hexachlorobiphenyl (#169) | 0,03 |
| PCB105 | 2,3,3',4,4'-Pentachlorobiphenyl (#105) | 0,00003 |
| PCB114 | 2,3,4,4',5-Pentachlorobiphenyl (#114) | 0,00003 |
| PCB118 | 2,3',4,4',5-Pentachlorobiphenyl (#118) | 0,00003 |
| PCB123 | 2,3,4,4',5-Pentachlorobiphenyl (#123) | 0,00003 |
| PCB156 | 2,3,3',4,4',5-Hexachlorobiphenyl (#156) | 0,00003 |
| PCB157 | 2,3,3',4,4',5'-Hexachlorobiphenyl (#157) | 0,00003 |
| PCB167 | 2,3',4,4',5,5'-Hexachlorobiphenyl (#167) | 0,00003 |
| PCB189 | 2,3,3',4,4',5,5'-Heptachlorobiphenyl (#189) | 0,00003 |

EU regulations for dioxins (PCDD/F/dl-PCB)

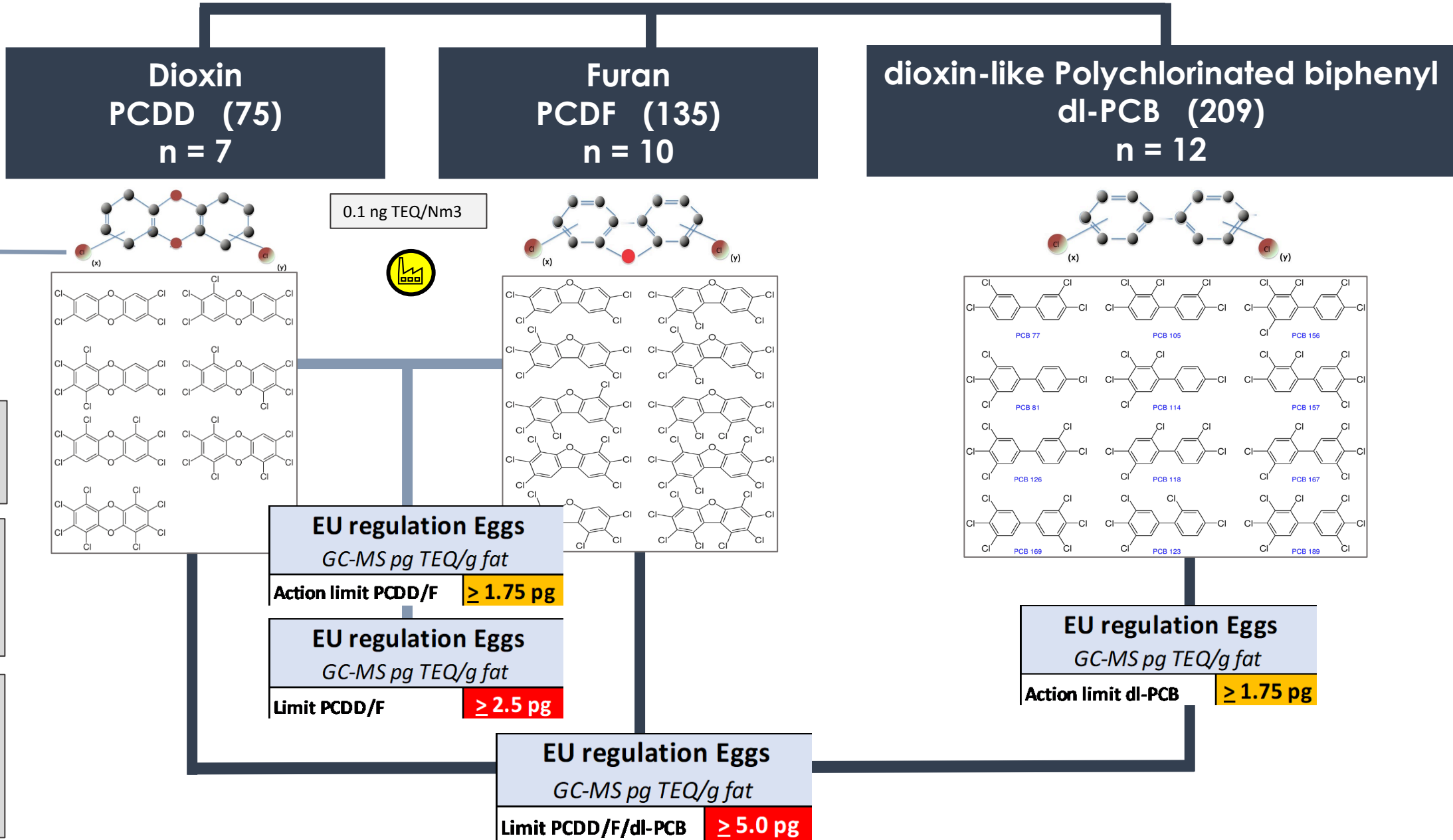
Halogens

Chlorine (Cl)
Bromine (Br)
Fluorine (F)
Iodine (I)

Chlorine can be substituted by an other halogen

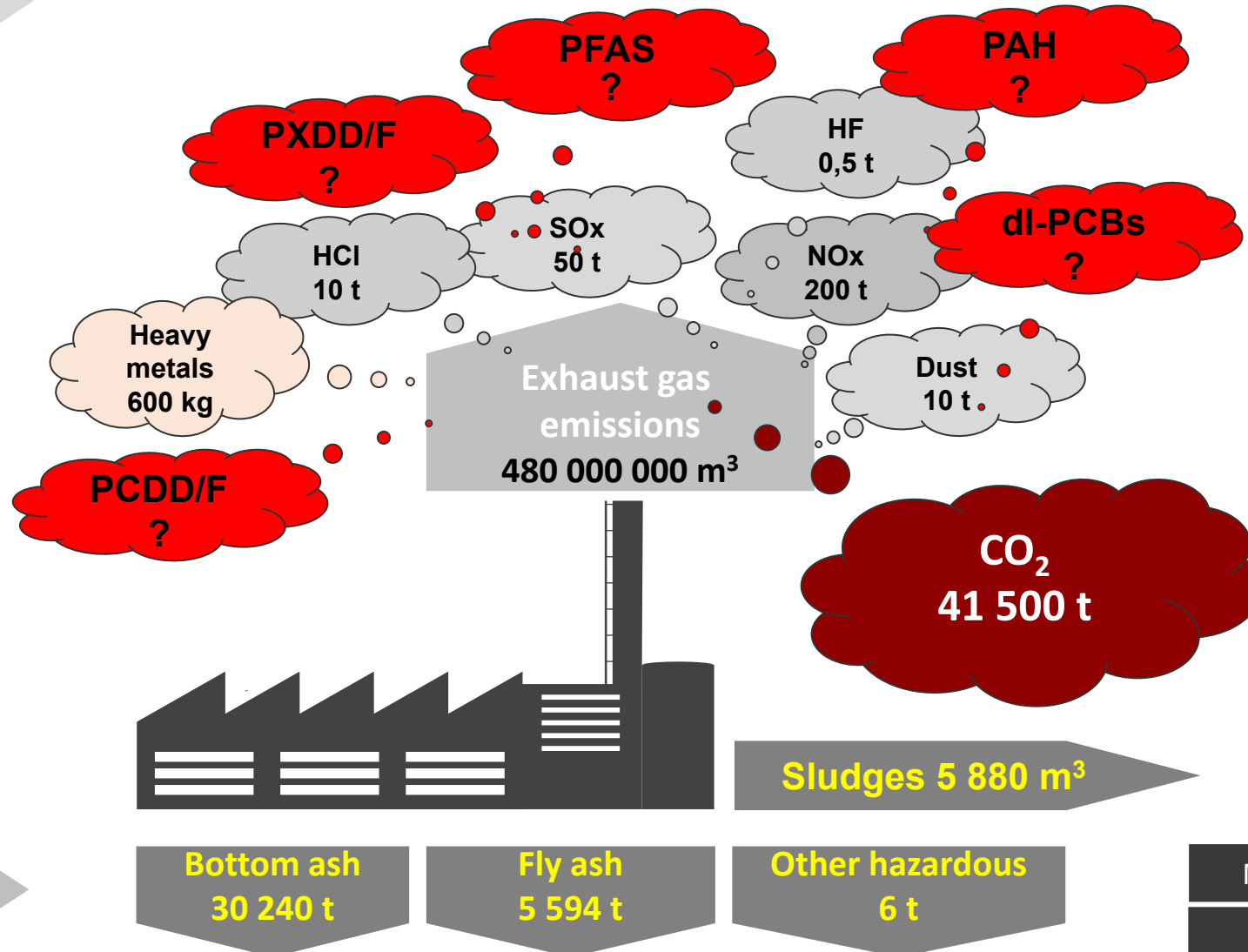
EU regulations only for **PCDD/F** in emissions

EU regulations only on **Chlorinated Persistent Organic Pollutants (POP)**



What are the real emissions & residues of a modern waste (WtE) incineration plant ?

Does the emissions of waste incineration comply with EU emission standard ?



Waste input
100 000 t

Natural gas 504 000 m³
water 21 000 m³
chemicals 2 910 t



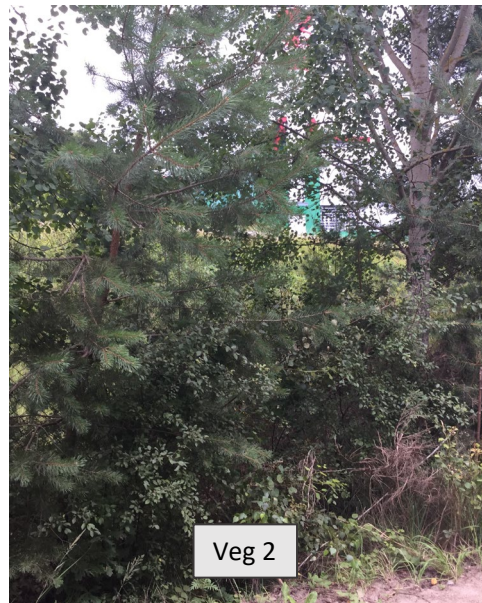
Results pine needles *Pinus sylvestris*, Pilsen, Czech Rep. - 2021

| Pine needles, Pilsen Czech Rep. 2021 | | | | | | Results Pine needles of <i>Pinus sylvestris</i> | | |
|--------------------------------------|---------|-------------------------|-----------|------------------|----------|---|--------------------------------|--------|
| CZ team location | Species | Species | sample | TW-REF-NR | Distance | PCDD/F/dl-PCB | PCDD/F | dl-PCB |
| Delivering nr | nr | | date | | (m) | DR CALUX | <i>(pg TCDD eq./g product)</i> | |
| 1 (A) | PS01 | <i>Pinus sylvestris</i> | 28-7-2021 | TW-CZ21-PS-Veg01 | 520 | 0.36 | 0.09 | 0.27 |
| 2 (B) | PS02 | <i>Pinus sylvestris</i> | 28-7-2021 | TW-CZ21-PS-Veg02 | 274 | 0.16 | 0.06 | 0.10 |
| 4 (E) | PS03 | <i>Pinus sylvestris</i> | 29-7-2021 | TW-CZ21-PS-Veg04 | 1380 | 0.19 | 0.06 | 0.13 |
| 5 (F) | PS04 | <i>Pinus sylvestris</i> | 29-7-2021 | TW-CZ21-PS-Veg05 | 3410 | 0.12 | 0.05 | 0.07 |
| 6 (D) | PS05 | <i>Pinus sylvestris</i> | 29-7-2021 | TW-CZ21-PS-Veg06 | 1000 | 0.22 | 0.05 | 0.17 |



Veg 1

Loc. 1 (A)



Veg 2

Loc. 2 (B)



Veg 6

Loc. 6 (D)



Veg 4

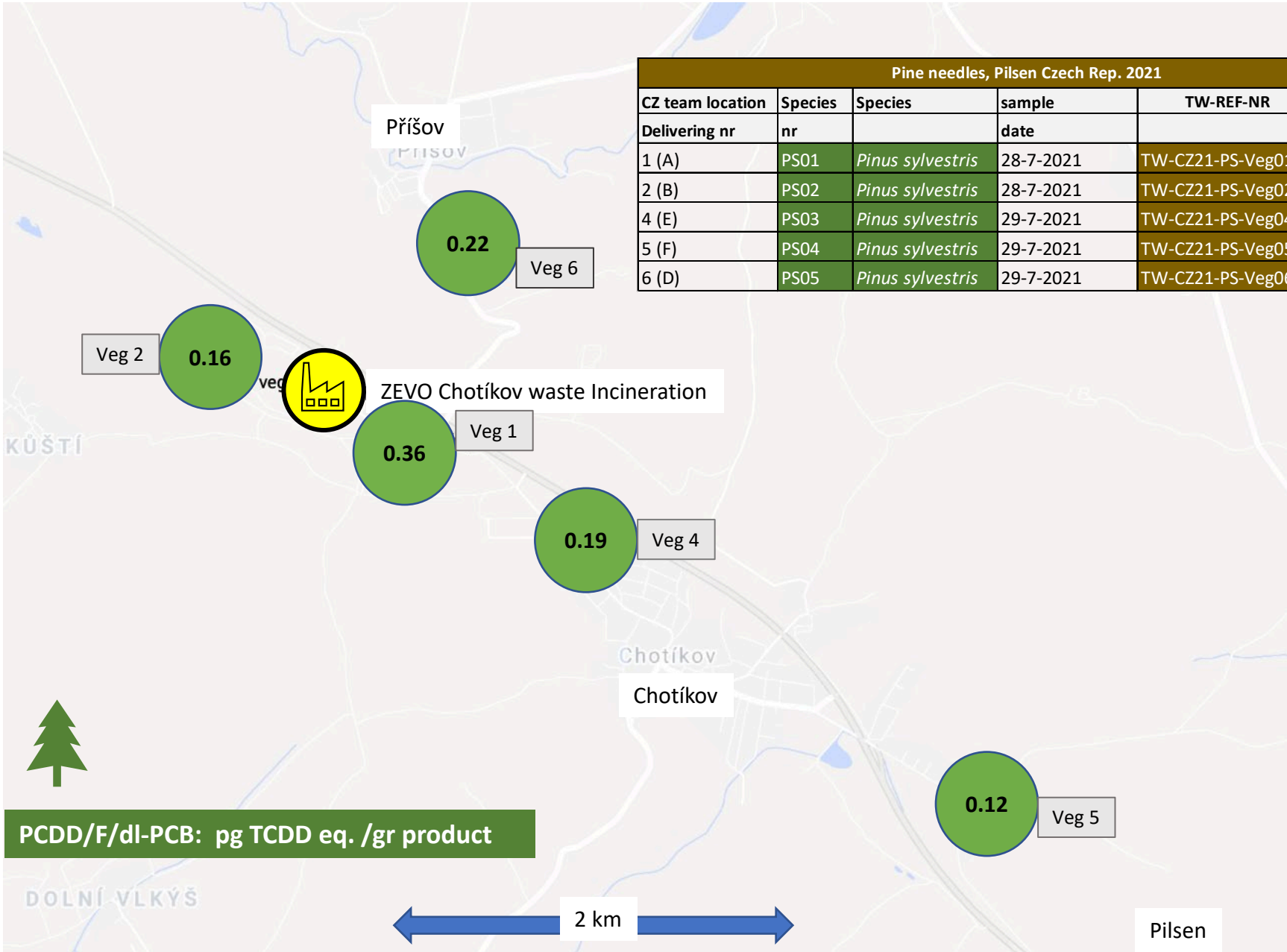
Loc. 4 (E)



Veg 5

Loc. 5 (F)

Sum of dioxins (PCDD/F/dl-PCB) in pine needles (*Pinus sylvestris*) Pilsen, Czech Rep. - 2021

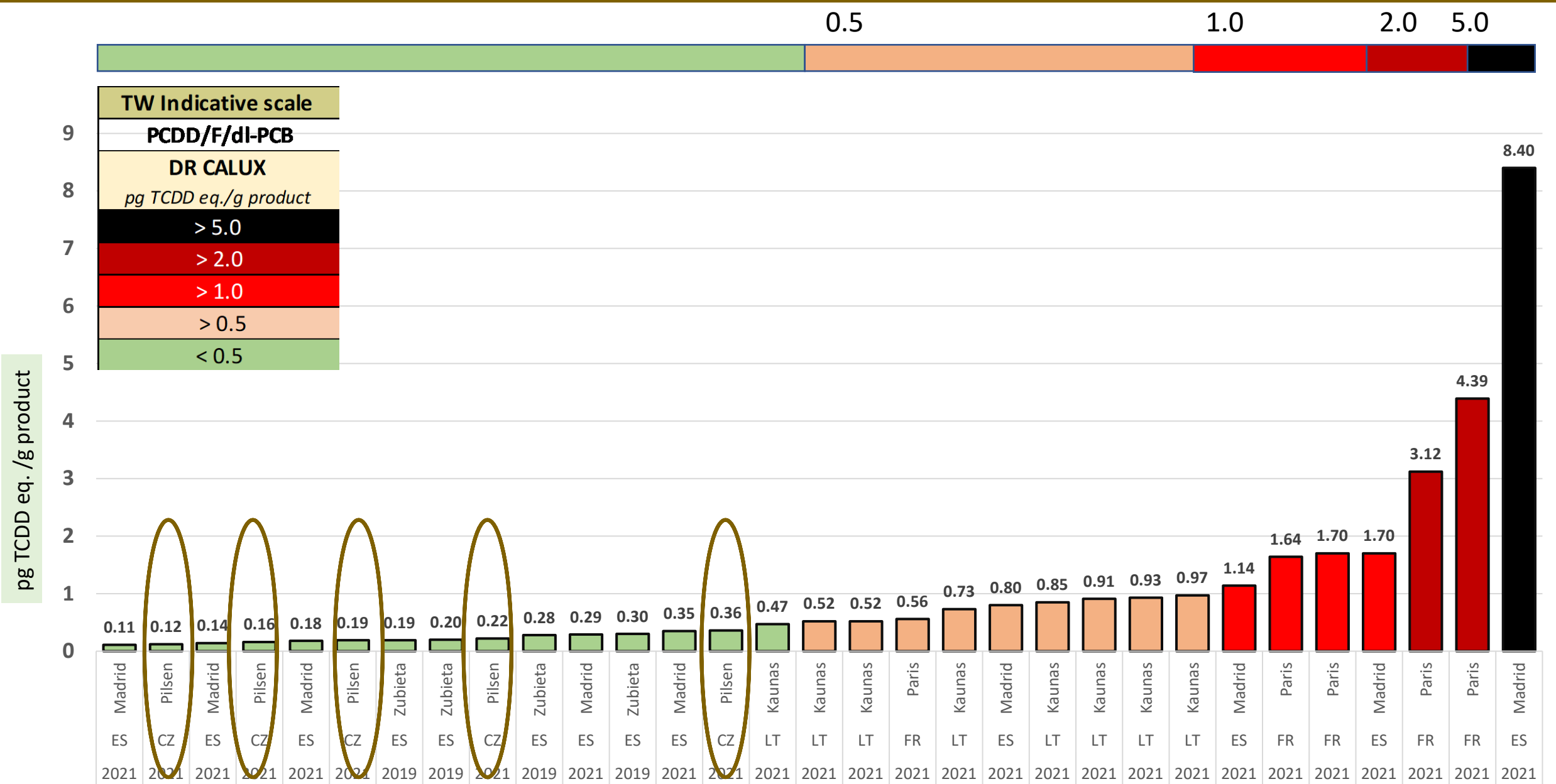


| Pine needles, Pilsen Czech Rep. 2021 | | | | | | Results Pine needles of <i>Pinus sylvestris</i> | | |
|--------------------------------------|---------|-------------------------|-----------|------------------|----------|---|-------------------------|--------|
| CZ team location | Species | Species | sample | TW-REF-NR | Distance | PCDD/F/dl-PCB | PCDD/F | dl-PCB |
| Delivering nr | nr | | date | | (m) | DR CALUX | (pg TCDD eq./g product) | |
| 1 (A) | PS01 | <i>Pinus sylvestris</i> | 28-7-2021 | TW-CZ21-PS-Veg01 | 520 | 0.36 | 0.09 | 0.27 |
| 2 (B) | PS02 | <i>Pinus sylvestris</i> | 28-7-2021 | TW-CZ21-PS-Veg02 | 274 | 0.16 | 0.06 | 0.10 |
| 4 (E) | PS03 | <i>Pinus sylvestris</i> | 29-7-2021 | TW-CZ21-PS-Veg04 | 1380 | 0.19 | 0.06 | 0.13 |
| 5 (F) | PS04 | <i>Pinus sylvestris</i> | 29-7-2021 | TW-CZ21-PS-Veg05 | 3410 | 0.12 | 0.05 | 0.07 |
| 6 (D) | PS05 | <i>Pinus sylvestris</i> | 29-7-2021 | TW-CZ21-PS-Veg06 | 1000 | 0.22 | 0.05 | 0.17 |

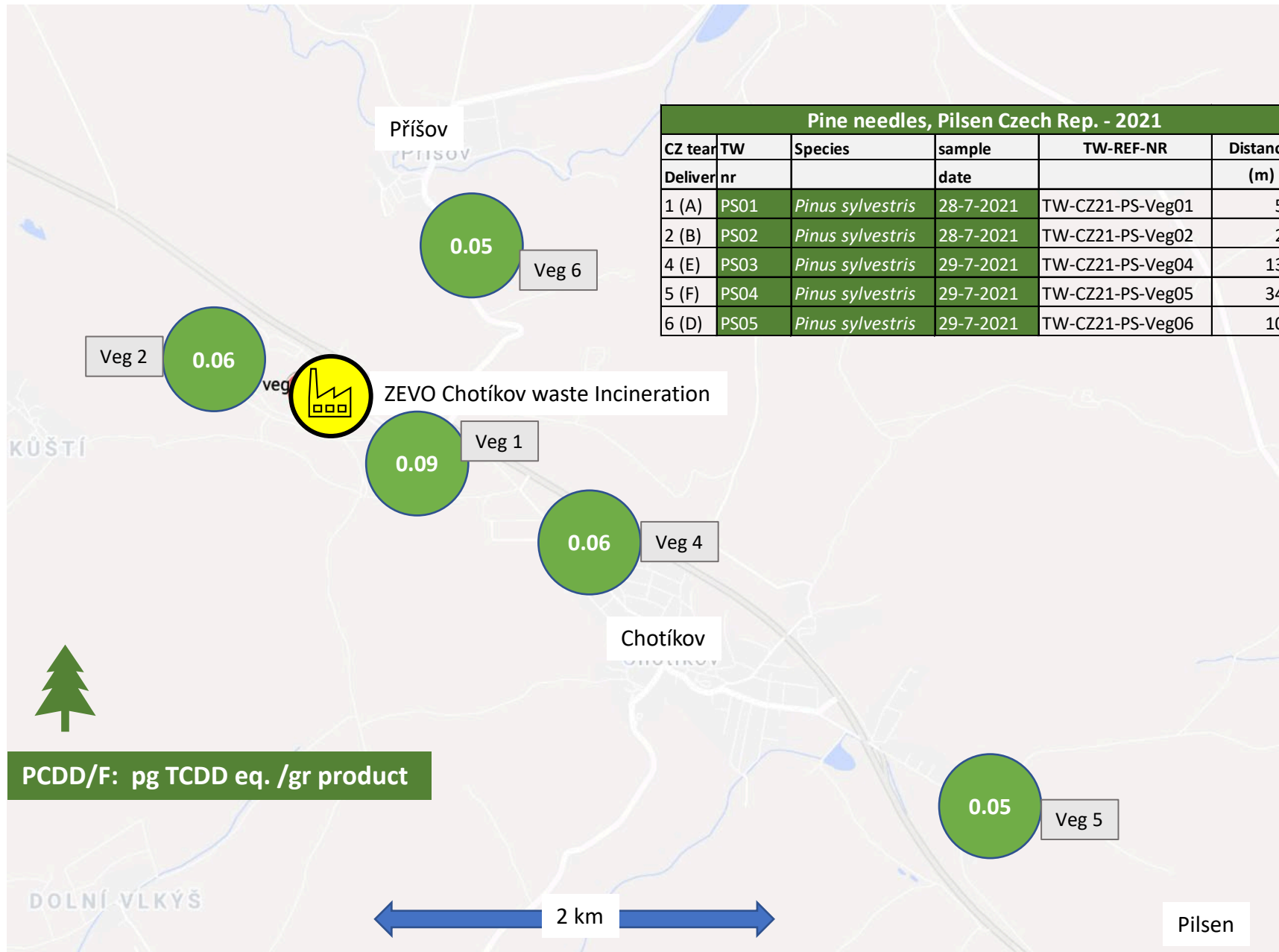
| TW Indicative scale Results |
|---------------------------------|
| DR CALUX |
| > 5.0 pg TCDD eq./g product |
| > 2.0 pg TCDD eq./g product |
| 1.0 - 2.0 pg TCDD eq./g product |
| 0.5 - 1.0 pg TCDD eq./g product |
| < 0.5 pg TCDD eq./g product |

PCDD/F/dl-PCB: pg TCDD eq. /gr product

Indicative scale PCDD/F/dl-PCB in evergreen trees Pilsen, Czech Rep. 2021



Dioxins (PCDD/F) in pine needles (*Pinus sylvestris*) Pilsen, Czech Rep. - 2021

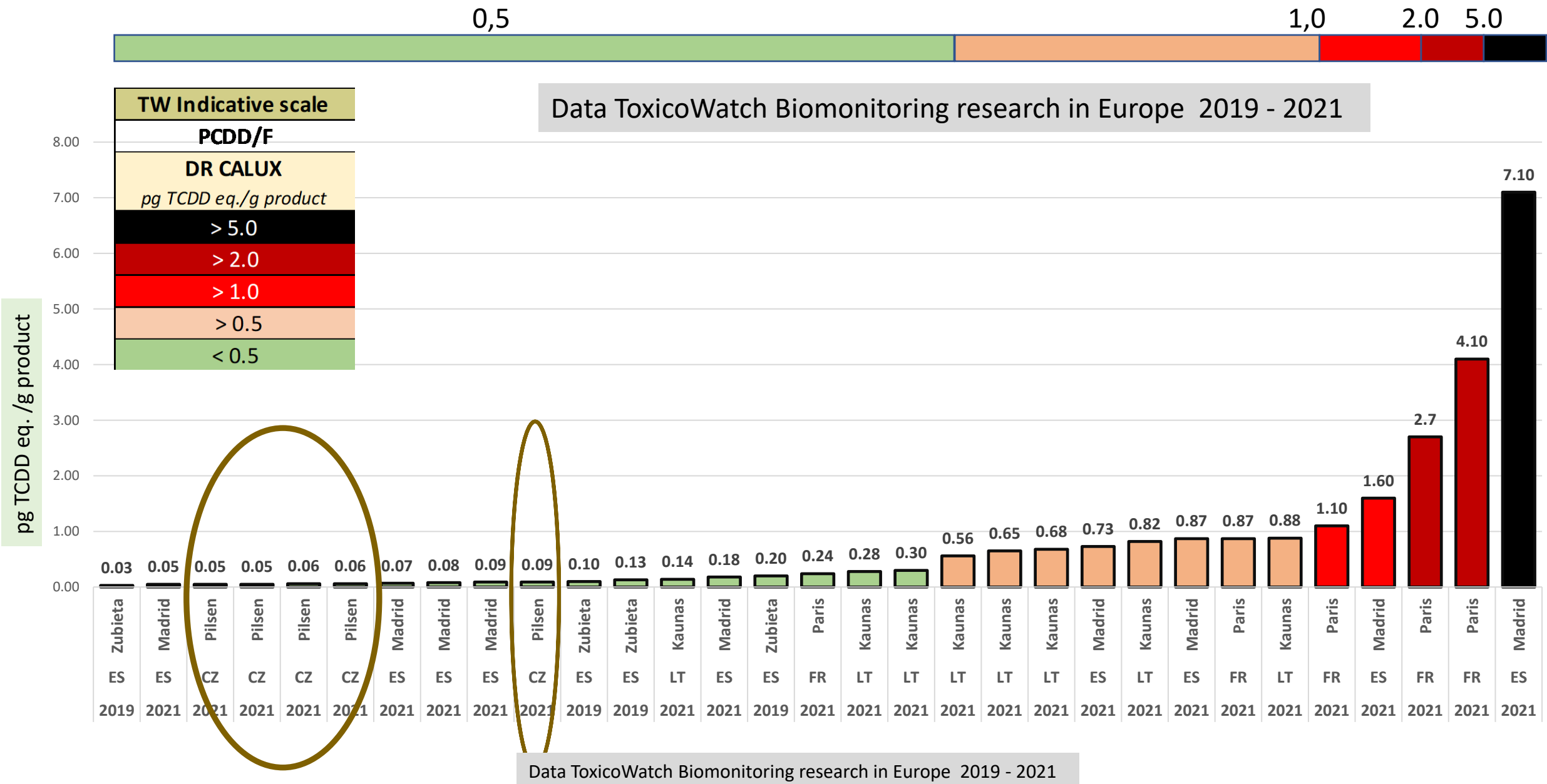


| Pine needles, Pilsen Czech Rep. - 2021 | | | | | | Results Pine needles, Pilsen Czech Rep. - 2021 | | | |
|--|------|-------------------------|-----------|------------------|----------|--|-------------------------|--------|------------------|
| CZ tear | TW | Species | sample | TW-REF-NR | Distance | PCDD/F/dl-PCB | PCDD/F | dl-PCB | PAH |
| Deliver | nr | | date | | (m) | DR CALUX | (pg TCDD eq./g product) | | ng BaP eq./g pr. |
| 1 (A) | PS01 | <i>Pinus sylvestris</i> | 28-7-2021 | TW-CZ21-PS-Veg01 | 520 | 0.36 | 0.09 | 0.27 | 61.00 |
| 2 (B) | PS02 | <i>Pinus sylvestris</i> | 28-7-2021 | TW-CZ21-PS-Veg02 | 274 | 0.16 | 0.06 | 0.10 | |
| 4 (E) | PS03 | <i>Pinus sylvestris</i> | 29-7-2021 | TW-CZ21-PS-Veg04 | 1380 | 0.19 | 0.06 | 0.13 | |
| 5 (F) | PS04 | <i>Pinus sylvestris</i> | 29-7-2021 | TW-CZ21-PS-Veg05 | 3410 | 0.12 | 0.05 | 0.07 | 0.70 |
| 6 (D) | PS05 | <i>Pinus sylvestris</i> | 29-7-2021 | TW-CZ21-PS-Veg06 | 1000 | 0.22 | 0.05 | 0.17 | |

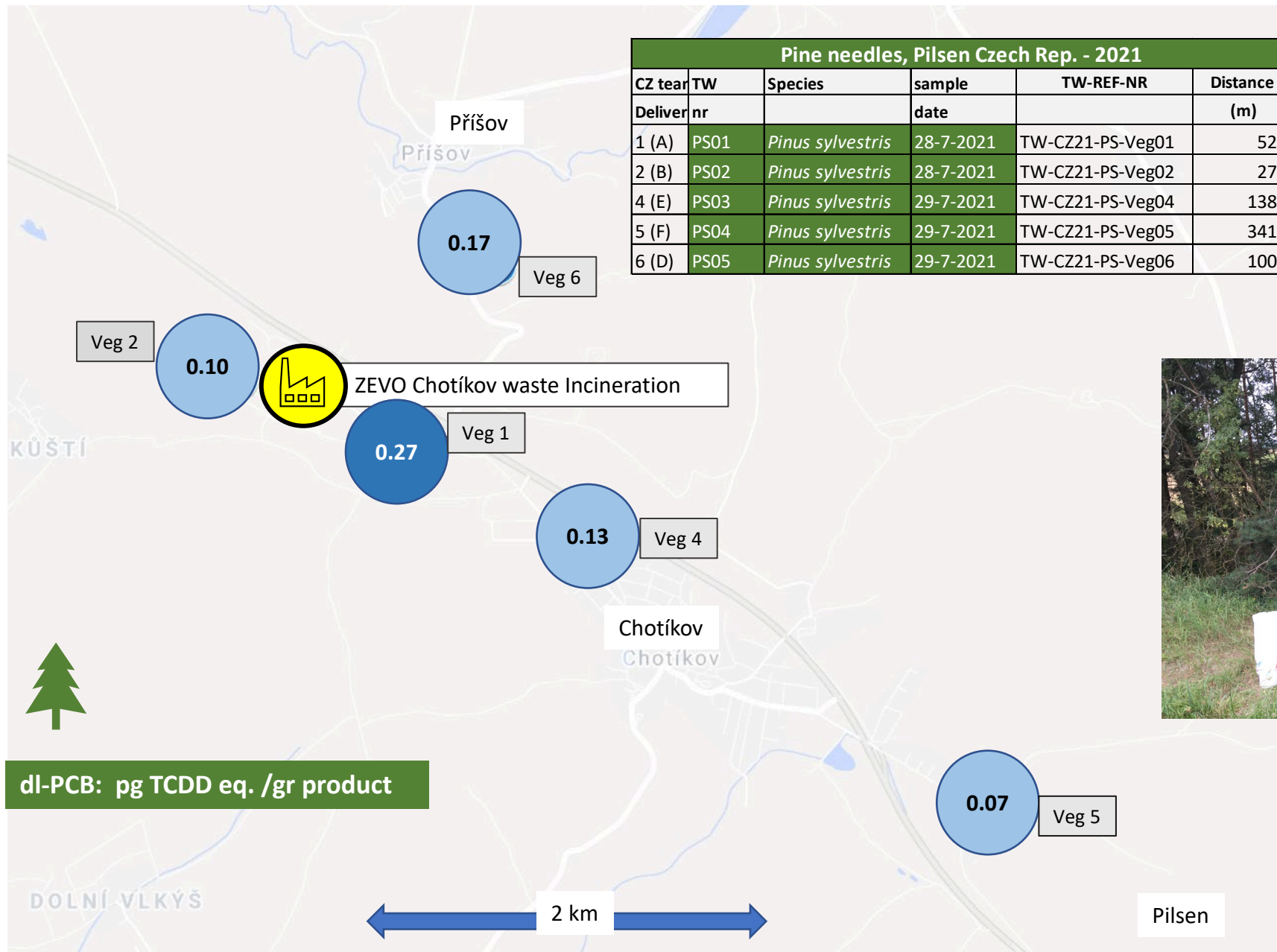
PCDD/F: pg TCDD eq. /gr product

| TW Indicative scale Results |
|---------------------------------|
| DR CALUX |
| > 5.0 pg TCDD eq./g product |
| > 2.0 pg TCDD eq./g product |
| 1.0 - 2.0 pg TCDD eq./g product |
| 0.5 - 1.0 pg TCDD eq./g product |
| < 0.5 pg TCDD eq./g product |

Indicative scale PCDD/F in evergreen trees Pilsen, Czech Rep. 2021



DL-PCB in pine needles, *Pinus sylvestris* - Pilsen, Czech Rep. - 2021

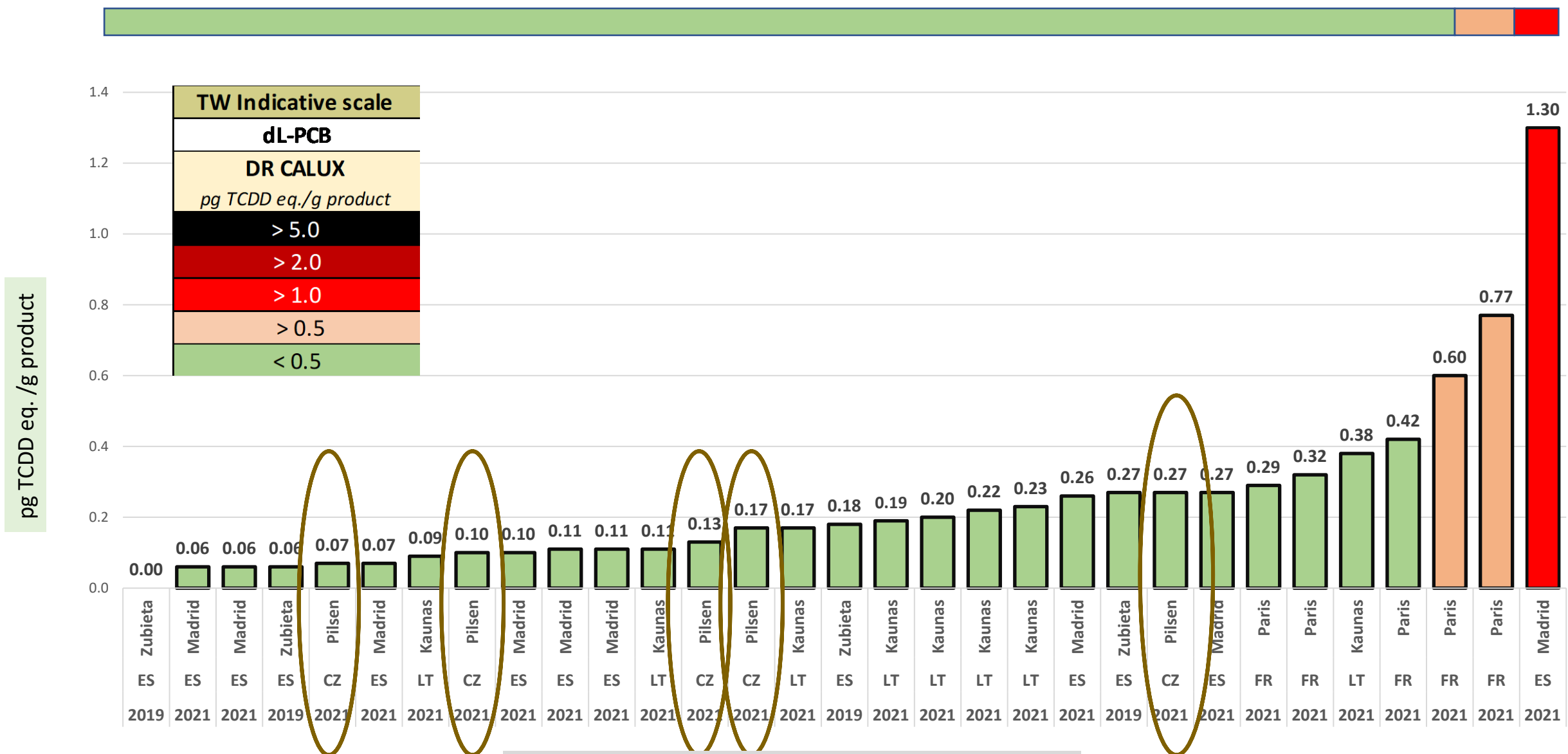


| Pine needles, Pilsen Czech Rep. - 2021 | | | | | | Results Pine needles, Pilsen Czech Rep. | | |
|--|------|-------------------------|-----------|------------------|----------|---|-------------------------|--------|
| CZ tear | TW | Species | sample | TW-REF-NR | Distance | PCDD/F/dl-PCB | PCDD/F | dl-PCB |
| Deliver | nr | | date | | (m) | DR CALUX | (pg TCDD eq./g product) | |
| 1 (A) | PS01 | <i>Pinus sylvestris</i> | 28-7-2021 | TW-CZ21-PS-Veg01 | 520 | 0.36 | 0.09 | 0.27 |
| 2 (B) | PS02 | <i>Pinus sylvestris</i> | 28-7-2021 | TW-CZ21-PS-Veg02 | 274 | 0.16 | 0.06 | 0.10 |
| 4 (E) | PS03 | <i>Pinus sylvestris</i> | 29-7-2021 | TW-CZ21-PS-Veg04 | 1380 | 0.19 | 0.06 | 0.13 |
| 5 (F) | PS04 | <i>Pinus sylvestris</i> | 29-7-2021 | TW-CZ21-PS-Veg05 | 3410 | 0.12 | 0.05 | 0.07 |
| 6 (D) | PS05 | <i>Pinus sylvestris</i> | 29-7-2021 | TW-CZ21-PS-Veg06 | 1000 | 0.22 | 0.05 | 0.17 |

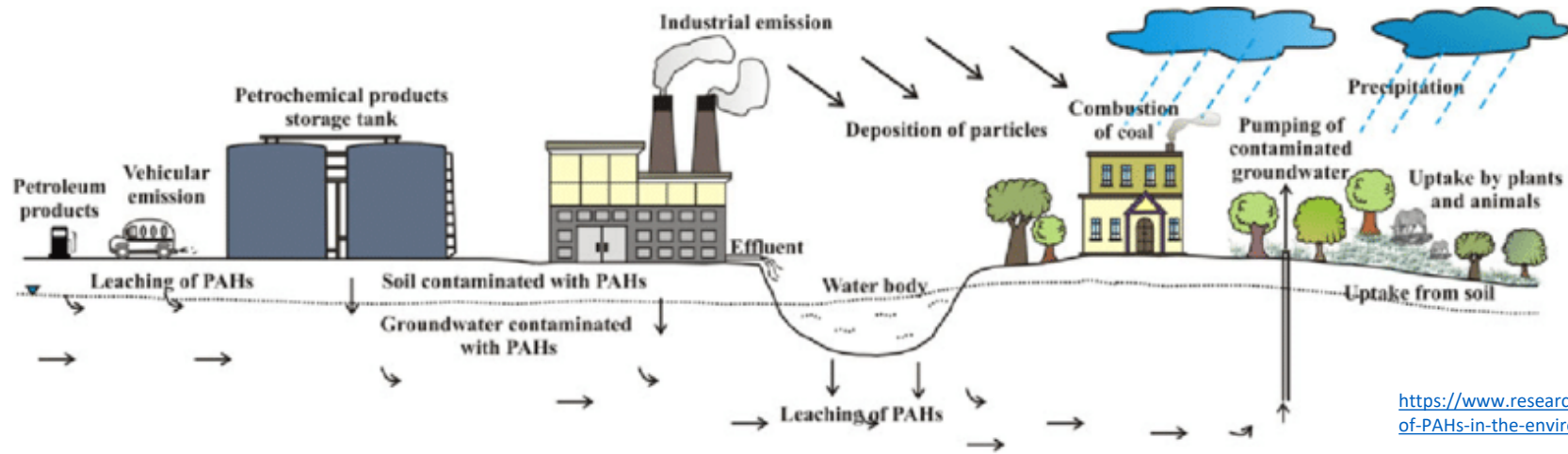


Indicative scale dl-PCB in evergreen trees Pilsen, Czech Rep. 2021

0,5 1,0 2.0

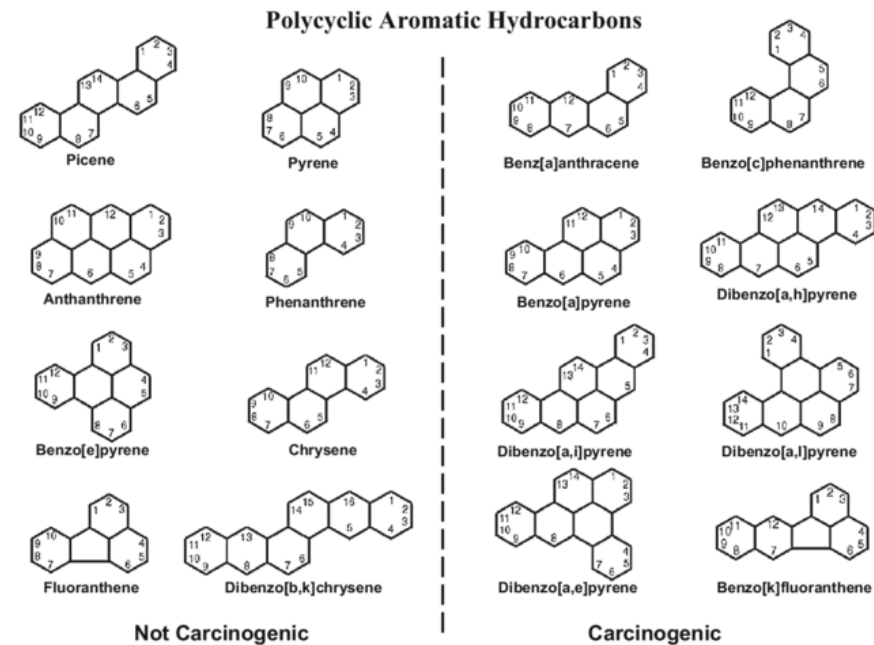


Polycyclic Aromatic Hydrocarbons (PAH)

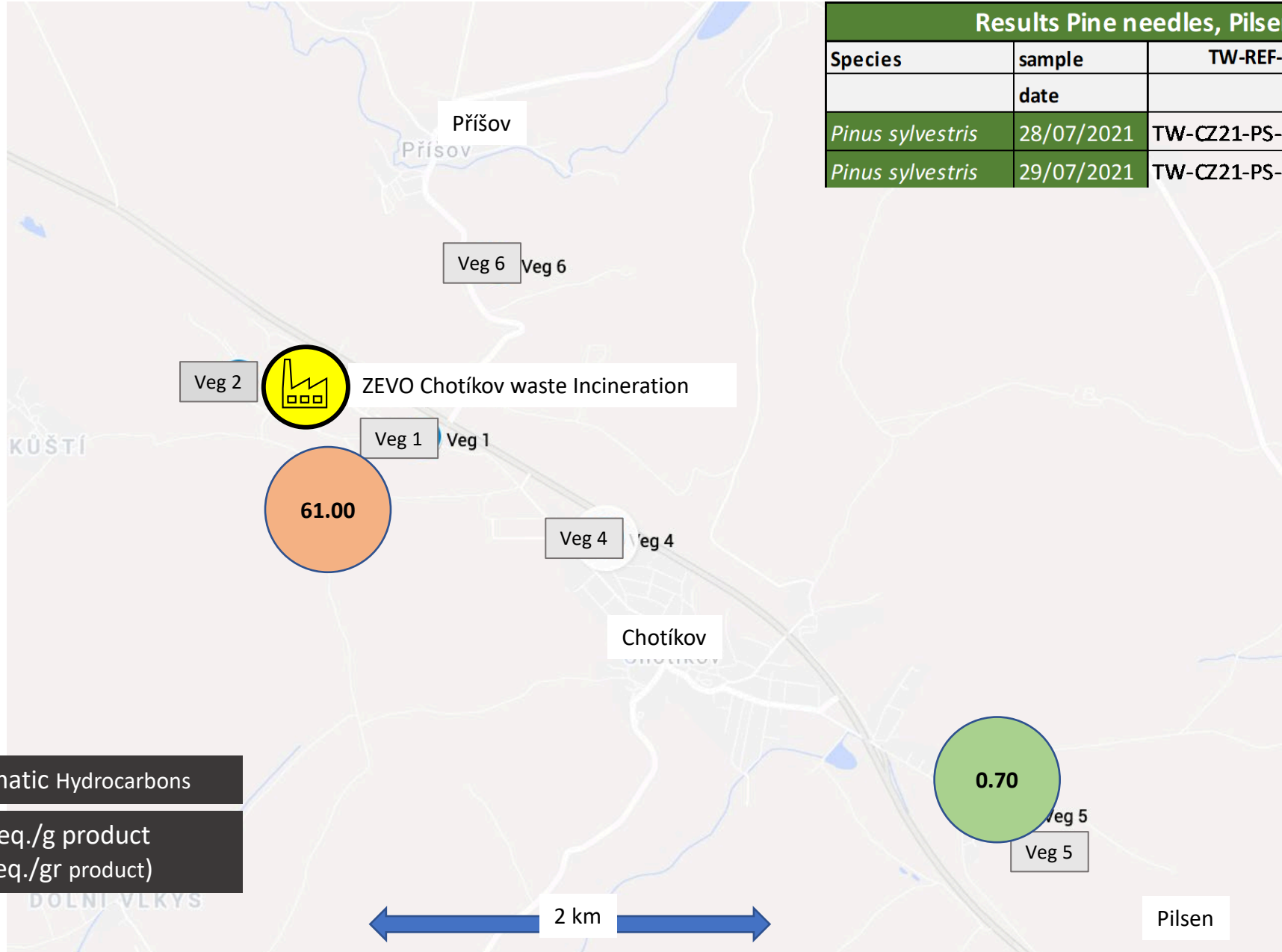


https://www.researchgate.net/figure/Sources-of-PAHs-in-the-environment_fig1_258987468

Anthropogenic sources and pathways of PAHs into the environment



PAH in pine needles, *Pinus sylvestris* - Pilsen, Czech Rep. 2021

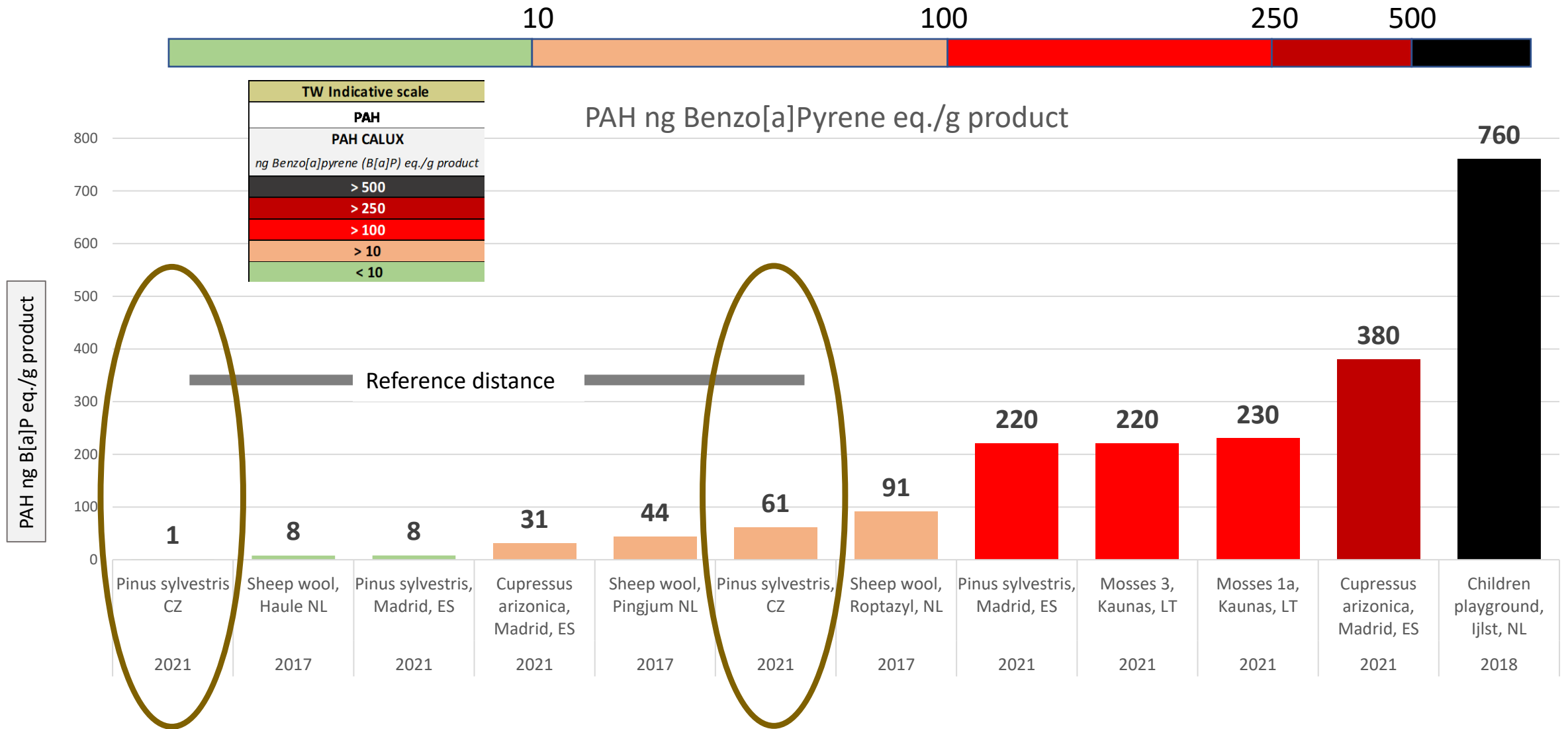


| Results Pine needles, Pilsen Czech rep. 2021 | | | | |
|--|------------|------------------|----------|--------------|
| Species | sample | TW-REF-NR | Distance | PAH |
| | date | | (m) | ng BAP/g pr. |
| <i>Pinus sylvestris</i> | 28/07/2021 | TW-CZ21-PS-Veg01 | 520 | 61.00 |
| <i>Pinus sylvestris</i> | 29/07/2021 | TW-CZ21-PS-Veg05 | 3410 | 0.70 |

PAH: Polycyclic Aromatic Hydrocarbons
 PAH CALUX: ng BaP eq./g product
 (ng Benzo[a]pyrene eq./gr product)

| Benzo[a]pyrene equivalent |
|------------------------------|
| TW Indicative scale Results |
| PAH |
| > 500 ng BaP eq./g product |
| > 250 ng BaP eq./g product |
| 100-250 ng BaP eq./g product |
| 10-100 ng BaP eq./g product |
| < 10 ng BaP eq./g product |

TW Indicative PAH CALUX scale in biomatrices (TW research 2017-2021)



Data ToxicoWatch Biomonitoring research in Europe 2017-2021



| Pine needles, Pilsen Czech rep. 2021 | | | | | |
|--------------------------------------|------|-------------------------|-----------|------------------|----------|
| CZ team location | TW | Species | sample | TW-REF-NR | Distance |
| Delivering nr | nr | | date | | (m) |
| 1 (A) | PS01 | <i>Pinus sylvestris</i> | 28-7-2021 | TW-CZ21-PS-Veg01 | 520 |
| 2 (B) | PS02 | <i>Pinus sylvestris</i> | 28-7-2021 | TW-CZ21-PS-Veg02 | 274 |
| 4 (E) | PS03 | <i>Pinus sylvestris</i> | 29-7-2021 | TW-CZ21-PS-Veg04 | 1380 |
| 5 (F) | PS04 | <i>Pinus sylvestris</i> | 29-7-2021 | TW-CZ21-PS-Veg05 | 3410 |
| 6 (D) | PS05 | <i>Pinus sylvestris</i> | 29-7-2021 | TW-CZ21-PS-Veg06 | 1000 |





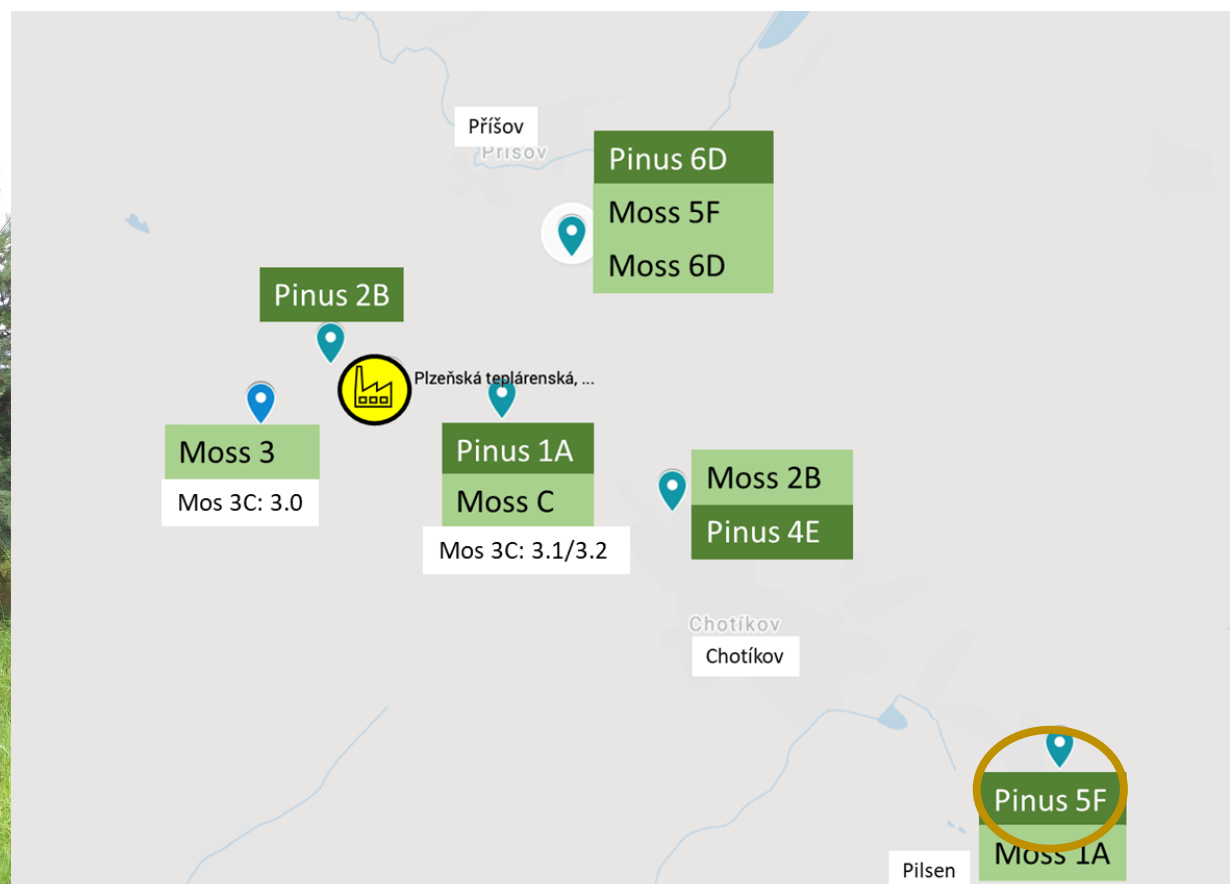
Pine needles, Pilsen Czech rep. 2021

| CZ team location | TW | Species | sample | TW-REF-NR | Distance |
|------------------|------|-------------------------|-----------|------------------|----------|
| Delivering nr | nr | | date | | (m) |
| 1 (A) | PS01 | <i>Pinus sylvestris</i> | 28-7-2021 | TW-CZ21-PS-Veg01 | 520 |
| 2 (B) | PS02 | <i>Pinus sylvestris</i> | 28-7-2021 | TW-CZ21-PS-Veg02 | 274 |
| 4 (E) | PS03 | <i>Pinus sylvestris</i> | 29-7-2021 | TW-CZ21-PS-Veg04 | 1380 |
| 5 (F) | PS04 | <i>Pinus sylvestris</i> | 29-7-2021 | TW-CZ21-PS-Veg05 | 3410 |
| 6 (D) | PS05 | <i>Pinus sylvestris</i> | 29-7-2021 | TW-CZ21-PS-Veg06 | 1000 |





| Pine needles, Pilsen Czech rep. 2021 | | | | | |
|--------------------------------------|------|-------------------------|-----------|------------------|----------|
| CZ team location | TW | Species | sample | TW-REF-NR | Distance |
| Delivering nr | nr | | date | | (m) |
| 1 (A) | PS01 | <i>Pinus sylvestris</i> | 28-7-2021 | TW-CZ21-PS-Veg01 | 520 |
| 2 (B) | PS02 | <i>Pinus sylvestris</i> | 28-7-2021 | TW-CZ21-PS-Veg02 | 274 |
| 4 (E) | PS03 | <i>Pinus sylvestris</i> | 29-7-2021 | TW-CZ21-PS-Veg04 | 1380 |
| 5 (F) | PS04 | <i>Pinus sylvestris</i> | 29-7-2021 | TW-CZ21-PS-Veg05 | 3410 |
| 6 (D) | PS05 | <i>Pinus sylvestris</i> | 29-7-2021 | TW-CZ21-PS-Veg06 | 1000 |



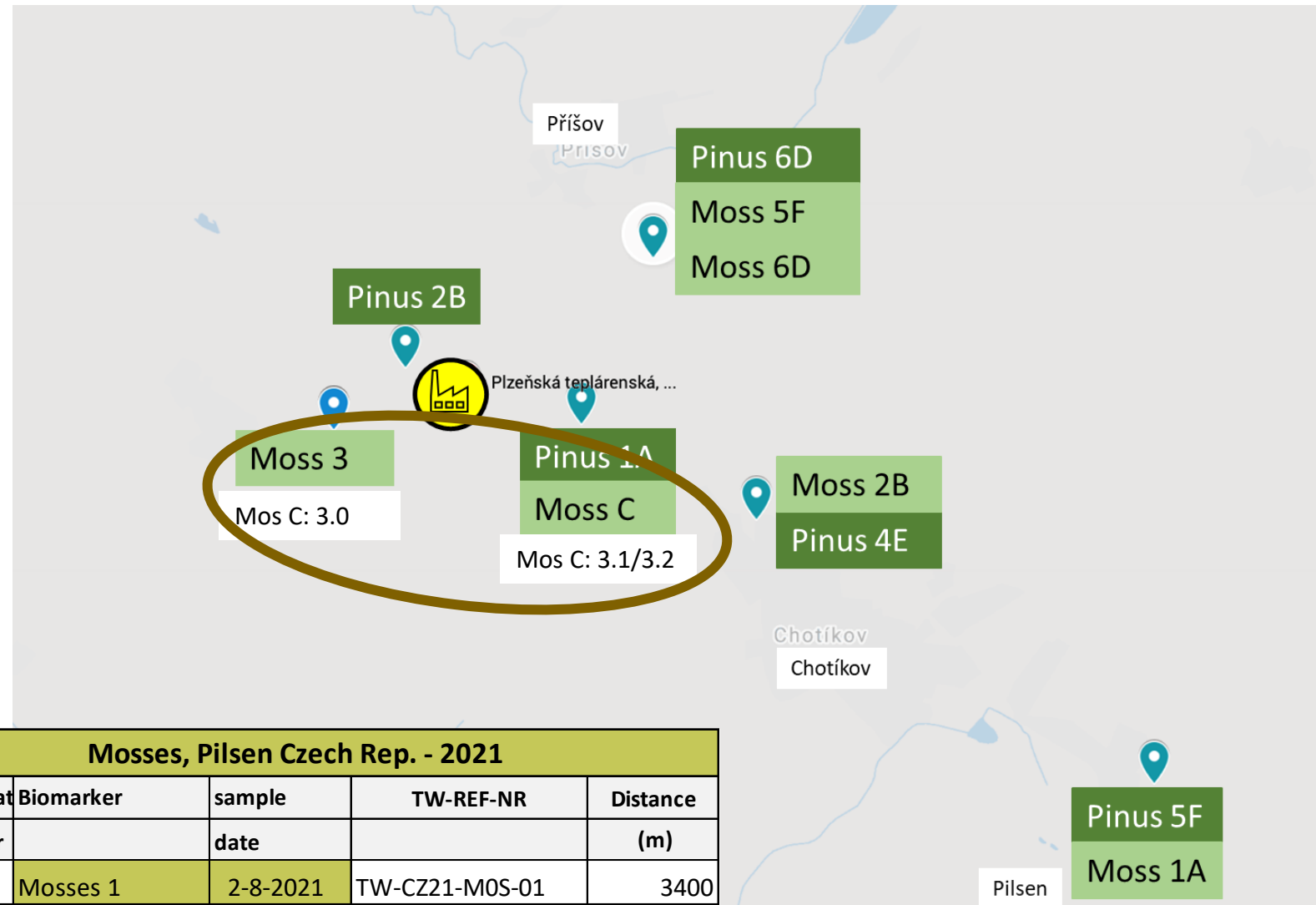
Pine needles, Pilsen Czech rep. 2021

| CZ team location | TW | Species | sample | TW-REF-NR | Distance |
|------------------|------|-------------------------|-----------|------------------|----------|
| Delivering nr | nr | | date | | (m) |
| 1 (A) | PS01 | <i>Pinus sylvestris</i> | 28-7-2021 | TW-CZ21-PS-Veg01 | 520 |
| 2 (B) | PS02 | <i>Pinus sylvestris</i> | 28-7-2021 | TW-CZ21-PS-Veg02 | 274 |
| 4 (E) | PS03 | <i>Pinus sylvestris</i> | 29-7-2021 | TW-CZ21-PS-Veg04 | 1380 |
| 5 (F) | PS04 | <i>Pinus sylvestris</i> | 29-7-2021 | TW-CZ21-PS-Veg05 | 3410 |
| 6 (D) | PS05 | <i>Pinus sylvestris</i> | 29-7-2021 | TW-CZ21-PS-Veg06 | 1000 |



| Pine needles, Pilsen Czech rep. 2021 | | | | | |
|--------------------------------------|------|-------------------------|-----------|------------------|----------|
| CZ team location | TW | Species | sample | TW-REF-NR | Distance |
| Delivering nr | nr | | date | | (m) |
| 1 (A) | PS01 | <i>Pinus sylvestris</i> | 28-7-2021 | TW-CZ21-PS-Veg01 | 520 |
| 2 (B) | PS02 | <i>Pinus sylvestris</i> | 28-7-2021 | TW-CZ21-PS-Veg02 | 274 |
| 4 (E) | PS03 | <i>Pinus sylvestris</i> | 29-7-2021 | TW-CZ21-PS-Veg04 | 1380 |
| 5 (F) | PS04 | <i>Pinus sylvestris</i> | 29-7-2021 | TW-CZ21-PS-Veg05 | 3410 |
| 6 (D) | PS05 | <i>Pinus sylvestris</i> | 29-7-2021 | TW-CZ21-PS-Veg06 | 1000 |

Mosses Sample locations region Pilsen, Czech Rep. - 2021

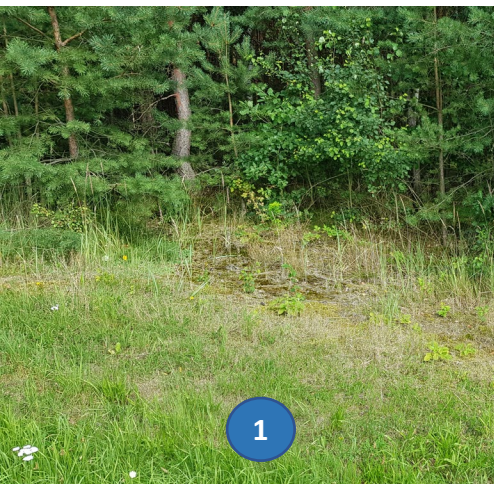


| Mosses, Pilsen Czech Rep. - 2021 | | | | |
|----------------------------------|-----------|----------|--------------------|----------|
| CZ team locat | Biomarker | sample | TW-REF-NR | Distance |
| Delivering nr | | date | | (m) |
| 1 (A) | Mosses 1 | 2-8-2021 | TW-CZ21-MOS-01 | 3400 |
| 2 (B) | Mosses 2 | 2-8-2021 | TW-CZ21-MOS-02 | 1400 |
| 3 (C) | Mosses 3 | 2-8-2021 | TW-CZ21-MOS-03.0/3 | 420 |
| 5 (F) | Mosses 4 | 2-8-2021 | TW-CZ21-MOS-04 | 980 |
| 6 (D) | Mosses 5 | 2-8-2021 | TW-CZ21-MOS-05.1/5 | 1000 |



Results dioxins (PCDD/F/dl-PCB) and PFAS in *Mosses*, Pilsen, Czech Rep. - 2021

| Mosses Pilsen, Czech Rep. - 2021 | | | | | Results Mosses Pilsen, Czech Rep. 2021 | | | |
|----------------------------------|-----------|----------|--------------------|----------|--|-------------------------|--------|------------------|
| CZ team location | Biomarker | sample | TW-REF-NR | Distance | PCDD/F/dl-PCB | PCDD/F | dl-PCB | PFAS (FITC-T4) |
| Delivering nr | | date | | (m) | DR CALUX | (pg TCDD eq./g product) | | ng PFOA eq/g pr. |
| 1 (A) | Mosses 1 | 2-8-2021 | TW-CZ21-MOS-01 | 3400 | 0.42 | 0.29 | 0.13 | 12.00 |
| 2 (B) | Mosses 2 | 2-8-2021 | TW-CZ21-MOS-02 | 1400 | 0.31 | 0.17 | 0.14 | |
| 3 (C) | Mosses 3 | 2-8-2021 | TW-CZ21-MOS-03.0/3 | 420 | 1.60 | 1.20 | 0.40 | 13.00 |
| 5 (F) | Mosses 4 | 2-8-2021 | TW-CZ21-MOS-04 | 980 | 0.53 | 0.31 | 0.22 | |
| 6 (D) | Mosses 5 | 2-8-2021 | TW-CZ21-MOS-05.1/5 | 1000 | 0.26 | 0.18 | 0.08 | |



Loc. 1(A)



Loc. 2(B)



Loc. 3(C)



Loc. 3(C)



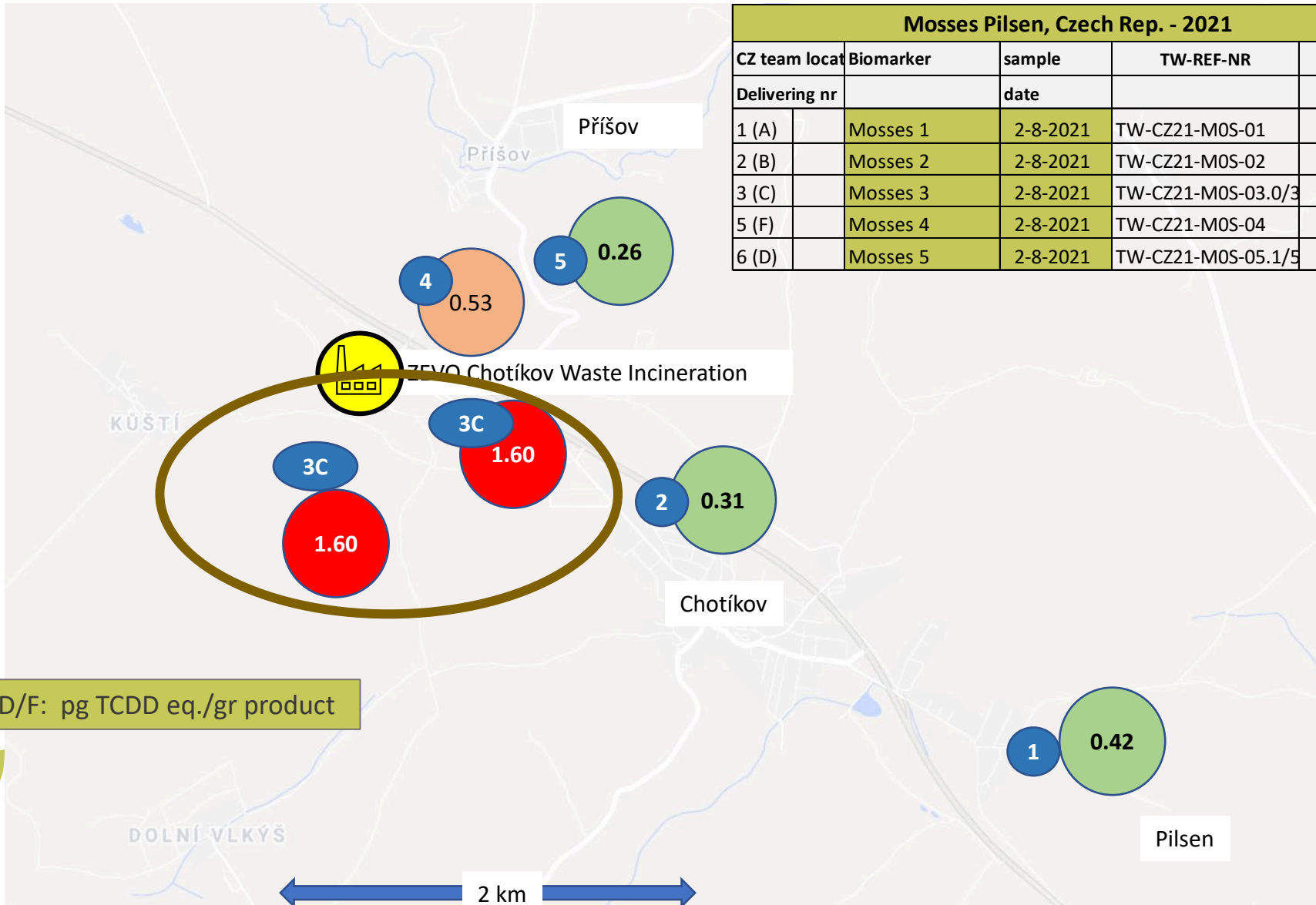
Loc. 5(F)



Loc. 6 (D)



Results sum of dioxins (PCDD/F/dl-PCB) in Mosses Pilsen, Czech Rep. - 2021

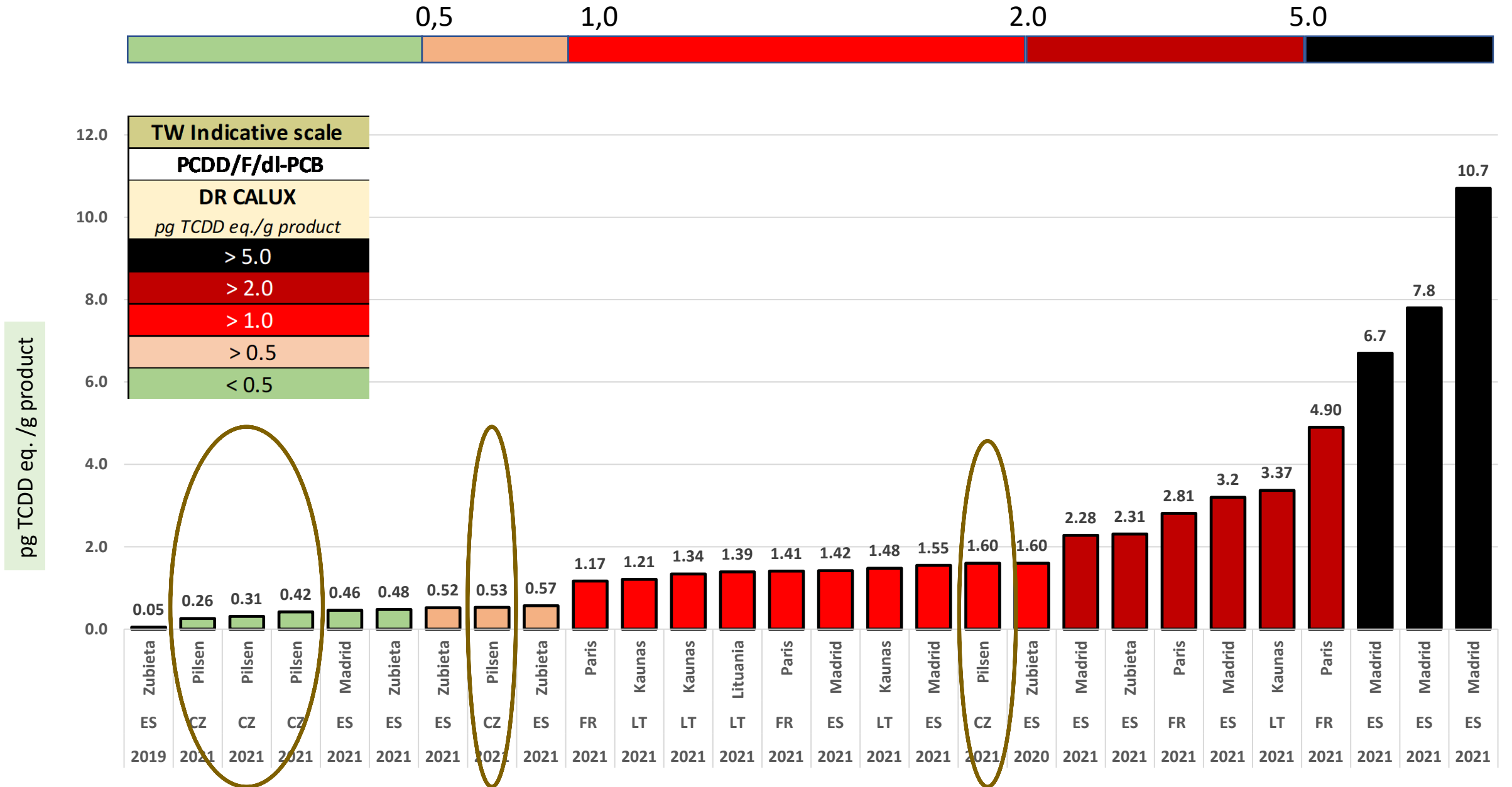


| Mosses Pilsen, Czech Rep. - 2021 | | | | | Results Mosses Pilsen, Czech Rep. 2021 | | | |
|----------------------------------|-----------|----------|--------------------|----------|--|-------------------------|--------|------------------|
| CZ team locat | Biomarker | sample | TW-REF-NR | Distance | PCDD/F/dl-PCB | PCDD/F | dl-PCB | PFAS (FITC-T4) |
| Delivering nr | | date | | (m) | DR CALUX | (pg TCDD eq./g product) | | ng PFOA eq/g pr. |
| 1 (A) | Mosses 1 | 2-8-2021 | TW-CZ21-MOS-01 | 3400 | 0.42 | 0.29 | 0.13 | 12.00 |
| 2 (B) | Mosses 2 | 2-8-2021 | TW-CZ21-MOS-02 | 1400 | 0.31 | 0.17 | 0.14 | |
| 3 (C) | Mosses 3 | 2-8-2021 | TW-CZ21-MOS-03.0/3 | 420 | 1.60 | 1.20 | 0.40 | 13.00 |
| 5 (F) | Mosses 4 | 2-8-2021 | TW-CZ21-MOS-04 | 980 | 0.53 | 0.31 | 0.22 | |
| 6 (D) | Mosses 5 | 2-8-2021 | TW-CZ21-MOS-05.1/5 | 1000 | 0.26 | 0.18 | 0.08 | |

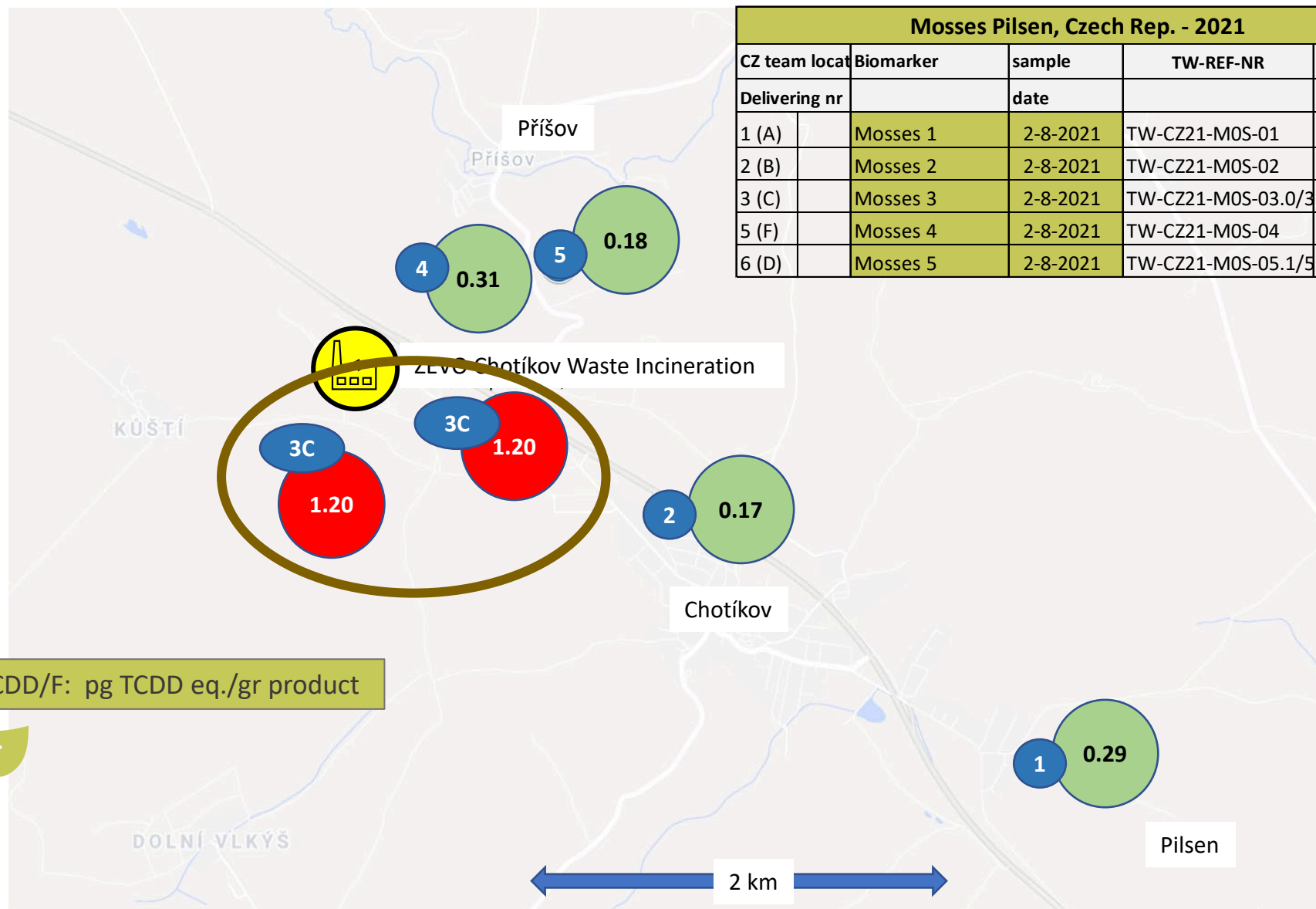
PCDD/F: pg TCDD eq./gr product

| TW Indicative scale Results |
|---------------------------------|
| DR CALUX |
| > 5.0 pg TCDD eq./g product |
| > 2.0 pg TCDD eq./g product |
| 1.0 - 2.0 pg TCDD eq./g product |
| 0.5 - 1.0 pg TCDD eq./g product |
| < 0.5 pg TCDD eq./g product |

Indicative scale dioxins (PCDD/F/dl-PCB) mosses Pilsen, Czech Rep. - 2021



Results dioxins (PCDD/F) in Mosses Pilsen, Czech Rep. - 2021

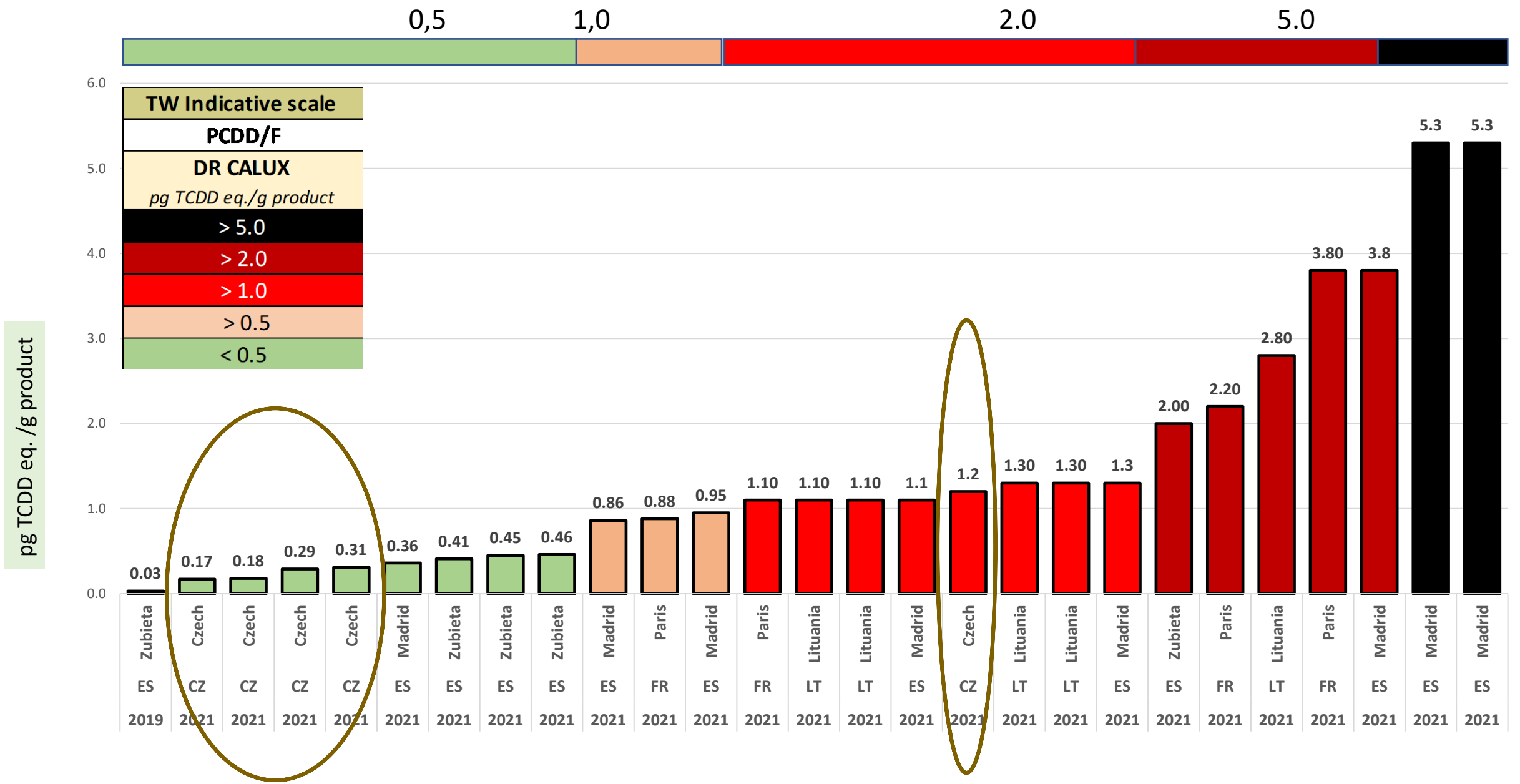


| Mosses Pilsen, Czech Rep. - 2021 | | | | | Results Mosses Pilsen, Czech Rep. 2021 | | | |
|----------------------------------|-----------|----------|--------------------|----------|--|-------------------------|--------|------------------|
| CZ team locat | Biomarker | sample | TW-REF-NR | Distance | PCDD/F/dl-PCB | PCDD/F | dl-PCB | PFAS (FITC-T4) |
| Delivering nr | | date | | (m) | DR CALUX | (pg TCDD eq./g product) | | ng PFOA eq/g pr. |
| 1 (A) | Mosses 1 | 2-8-2021 | TW-CZ21-MOS-01 | 3400 | 0.42 | 0.29 | 0.13 | 12.00 |
| 2 (B) | Mosses 2 | 2-8-2021 | TW-CZ21-MOS-02 | 1400 | 0.31 | 0.17 | 0.14 | |
| 3 (C) | Mosses 3 | 2-8-2021 | TW-CZ21-MOS-03.0/3 | 420 | 1.60 | 1.20 | 0.40 | 13.00 |
| 5 (F) | Mosses 4 | 2-8-2021 | TW-CZ21-MOS-04 | 980 | 0.53 | 0.31 | 0.22 | |
| 6 (D) | Mosses 5 | 2-8-2021 | TW-CZ21-MOS-05.1/5 | 1000 | 0.26 | 0.18 | 0.08 | |

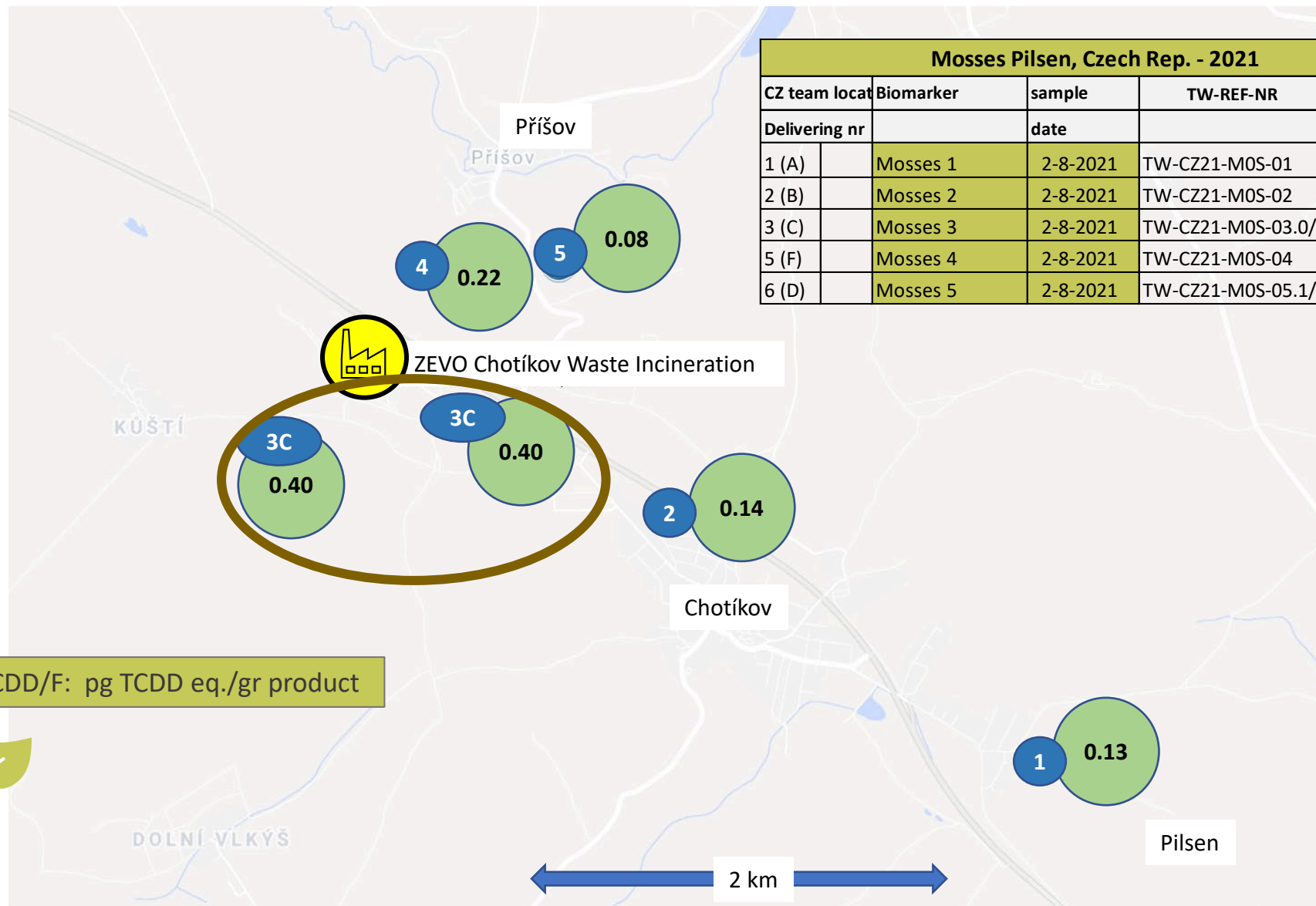
PCDD/F: pg TCDD eq./gr product

| TW Indicative scale Results |
|---------------------------------|
| DR CALUX |
| > 5.0 pg TCDD eq./g product |
| > 2.0 pg TCDD eq./g product |
| 1.0 - 2.0 pg TCDD eq./g product |
| 0.5 - 1.0 pg TCDD eq./g product |
| < 0.5 pg TCDD eq./g product |

Indicative scale PCDD/F in mosses Pilsen, Czech Rep. 2021



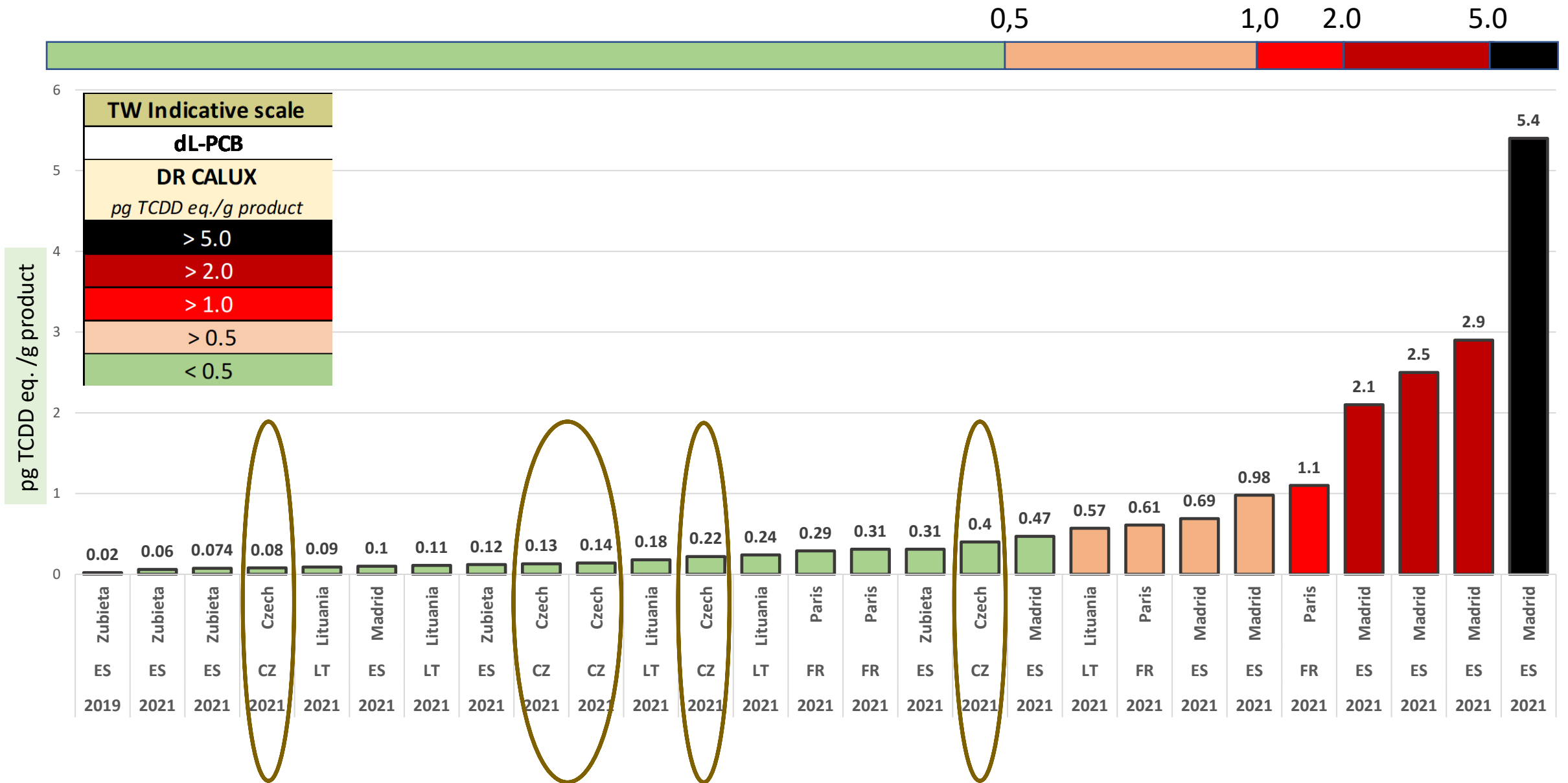
Results dioxin-like PCB (dl-PCBs) in Mosses Pilsen, Czech Rep. - 2021



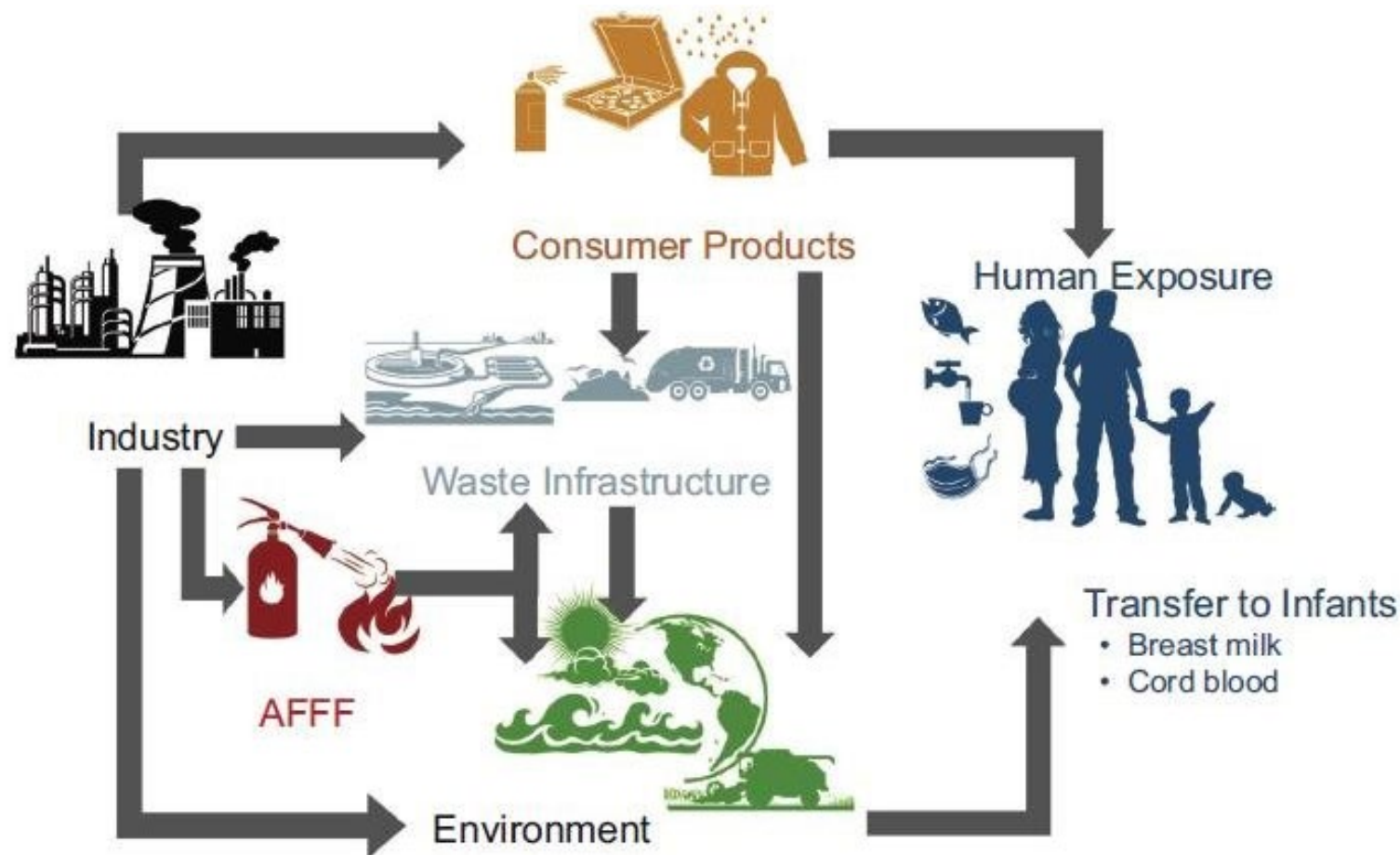
| Mosses Pilsen, Czech Rep. - 2021 | | | | | Results Mosses Pilsen, Czech Rep. 2021 | | | |
|----------------------------------|-----------|----------|--------------------|----------|--|-------------------------|--------|------------------|
| CZ team locat | Biomarker | sample | TW-REF-NR | Distance | PCDD/F/dl-PCB | PCDD/F | dl-PCB | PFAS (FITC-T4) |
| Delivering nr | | date | | (m) | DR CALUX | (pg TCDD eq./g product) | | ng PFOA eq/g pr. |
| 1 (A) | Mosses 1 | 2-8-2021 | TW-CZ21-MOS-01 | 3400 | 0.42 | 0.29 | 0.13 | 12.00 |
| 2 (B) | Mosses 2 | 2-8-2021 | TW-CZ21-MOS-02 | 1400 | 0.31 | 0.17 | 0.14 | |
| 3 (C) | Mosses 3 | 2-8-2021 | TW-CZ21-MOS-03.0/3 | 420 | 1.60 | 1.20 | 0.40 | 13.00 |
| 5 (F) | Mosses 4 | 2-8-2021 | TW-CZ21-MOS-04 | 980 | 0.53 | 0.31 | 0.22 | |
| 6 (D) | Mosses 5 | 2-8-2021 | TW-CZ21-MOS-05.1/5 | 1000 | 0.26 | 0.18 | 0.08 | |

| TW Indicative scale Results |
|---------------------------------|
| DR CALUX |
| > 5.0 pg TCDD eq./g product |
| > 2.0 pg TCDD eq./g product |
| 1.0 - 2.0 pg TCDD eq./g product |
| 0.5 - 1.0 pg TCDD eq./g product |
| < 0.5 pg TCDD eq./g product |

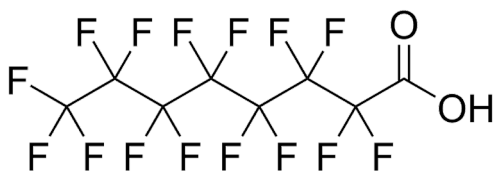
TW-indicative scale dl-PCB in mosses Pilsen, Czech Rep. - 2021



PFAS (Per- and polyfluoroalkyl substances)

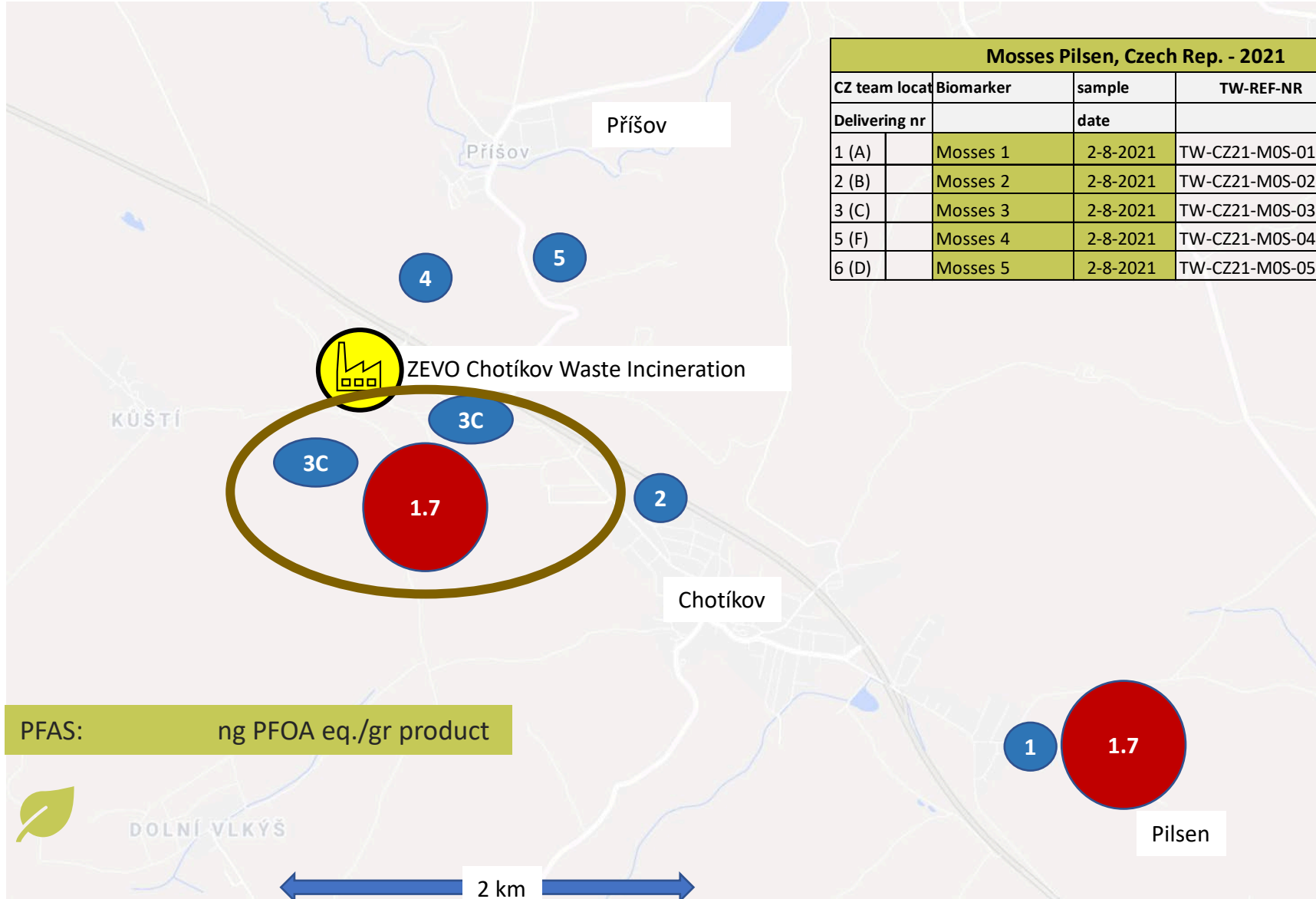


Overview of PFAS exposure pathways to the human population and the environment. Source: (Sunderland et al. 2019).



These are man-made substances that do not naturally occur in the environment. Examples of PFAS are GenX, PFOA perfluoro octanoic acid and PFOS perfluorooctane sulfonates. PFASs are used in many products. As a result, and due to emissions and incidents, these substances have ended up in the environment and are now found in, among other things, soil, dredging spoil and surface water. (<https://www.rivm.nl/en/pfas>)

Results PFAS (FITC-T4) in Mosses Pilsen, Czech Rep. - 2021

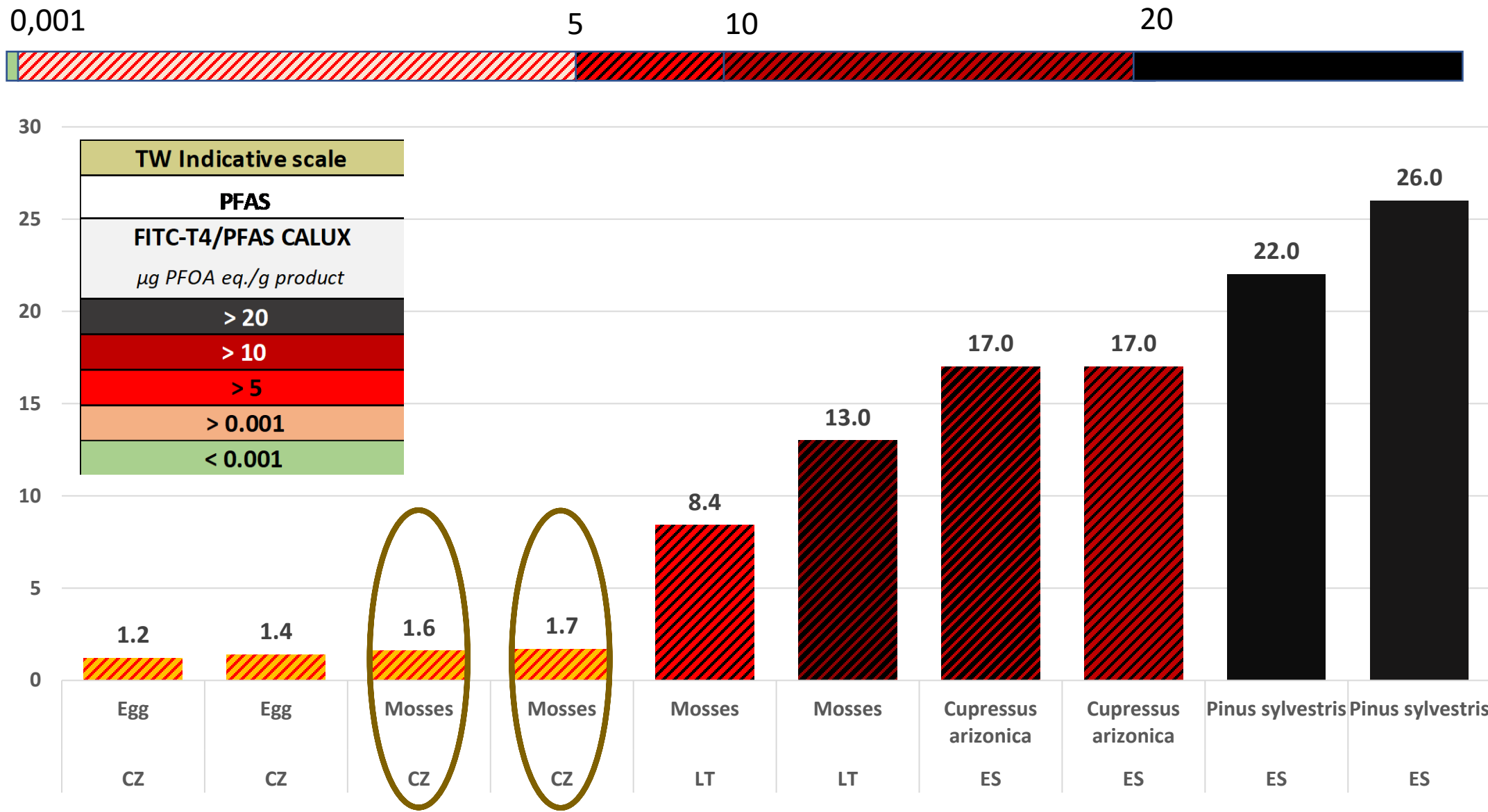


| Mosses Pilsen, Czech Rep. - 2021 | | | | | Results Mosses Pilsen, Czech Rep. 2021 | | | |
|----------------------------------|-----------|----------|--------------------|----------|--|-------------------------|--------|------------------|
| CZ team locat | Biomarker | sample | TW-REF-NR | Distance | PCDD/F/dl-PCB | PCDD/F | dl-PCB | PFAS (FITC-T4) |
| Delivering nr | | date | | (m) | DR CALUX | (pg TCDD eq./g product) | | µg PFOA eq/g pr. |
| 1 (A) | Mosses 1 | 2-8-2021 | TW-CZ21-MOS-01 | 3400 | 0.42 | 0.29 | 0.13 | 1.7 |
| 2 (B) | Mosses 2 | 2-8-2021 | TW-CZ21-MOS-02 | 1400 | 0.31 | 0.17 | 0.14 | |
| 3 (C) | Mosses 3 | 2-8-2021 | TW-CZ21-MOS-03.0/3 | 420 | 1.60 | 1.20 | 0.40 | 1.7 |
| 5 (F) | Mosses 4 | 2-8-2021 | TW-CZ21-MOS-04 | 980 | 0.53 | 0.31 | 0.22 | |
| 6 (D) | Mosses 5 | 2-8-2021 | TW-CZ21-MOS-05.1/5 | 1000 | 0.26 | 0.18 | 0.08 | |

PFAS: ng PFOA eq./gr product

| TW Indicative scale Results |
|---------------------------------|
| FITC-4 (PFAS) |
| > 20 µg PFOA eq./g product |
| 10 - 20 µg PFOA eq./g product |
| 5 - 10 µg PFOA eq./g product |
| 0,001 - 5 µg PFOA eq./g product |
| < 0,001 µg PFOA eq./g product |

TW indicative scale PFAS (μg PFOA eq./g product) in divers biomatrices



Data from ToxicoWatch Biomonitoring research in Europe 2021



| Mosses Pilsen, Czech Rep. - 2021 | | | | | Results Mosses Pilsen, Czech Rep. 2021 | | | |
|----------------------------------|-----------|----------|--------------------|----------|--|-------------------------|--------|------------------|
| CZ team locat | Biomarker | sample | TW-REF-NR | Distance | PCDD/F/dl-PCB | PCDD/F | dl-PCB | PFAS (FITC-T4) |
| Delivering nr | | date | | (m) | DR CALUX | (pg TCDD eq./g product) | | µg PFOA eq/g pr. |
| 1 (A) | Mosses 1 | 2-8-2021 | TW-CZ21-MOS-01 | 3400 | 0.42 | 0.29 | 0.13 | 1.7 |
| 2 (B) | Mosses 2 | 2-8-2021 | TW-CZ21-MOS-02 | 1400 | 0.31 | 0.17 | 0.14 | |
| 3 (C) | Mosses 3 | 2-8-2021 | TW-CZ21-MOS-03.0/3 | 420 | 1.60 | 1.20 | 0.40 | 1.7 |
| 5 (F) | Mosses 4 | 2-8-2021 | TW-CZ21-MOS-04 | 980 | 0.53 | 0.31 | 0.22 | |
| 6 (D) | Mosses 5 | 2-8-2021 | TW-CZ21-MOS-05.1/5 | 1000 | 0.26 | 0.18 | 0.08 | |



| Mosses Pilsen, Czech Rep. - 2021 | | | | | Results Mosses Pilsen, Czech Rep. 2021 | | | |
|----------------------------------|-----------|----------|--------------------|----------|--|-------------------------|--------|------------------|
| CZ team locat | Biomarker | sample | TW-REF-NR | Distance | PCDD/F/dl-PCB | PCDD/F | dl-PCB | PFAS (FITC-T4) |
| Delivering nr | | date | | (m) | DR CALUX | (pg TCDD eq./g product) | | µg PFOA eq/g pr. |
| 1 (A) | Mosses 1 | 2-8-2021 | TW-CZ21-MOS-01 | 3400 | 0.42 | 0.29 | 0.13 | 1.7 |
| 2 (B) | Mosses 2 | 2-8-2021 | TW-CZ21-MOS-02 | 1400 | 0.31 | 0.17 | 0.14 | |
| 3 (C) | Mosses 3 | 2-8-2021 | TW-CZ21-MOS-03.0/3 | 420 | 1.60 | 1.20 | 0.40 | 1.7 |
| 5 (F) | Mosses 4 | 2-8-2021 | TW-CZ21-MOS-04 | 980 | 0.53 | 0.31 | 0.22 | |
| 6 (D) | Mosses 5 | 2-8-2021 | TW-CZ21-MOS-05.1/5 | 1000 | 0.26 | 0.18 | 0.08 | |



| Mosses Pilsen, Czech Rep. - 2021 | | | | | Results Mosses Pilsen, Czech Rep. 2021 | | | |
|----------------------------------|-----------|----------|--------------------|----------|--|-------------------------|--------|------------------|
| CZ team locat | Biomarker | sample | TW-REF-NR | Distance | PCDD/F/dl-PCB | PCDD/F | dl-PCB | PFAS (FITC-T4) |
| Delivering nr | | date | | (m) | DR CALUX | (pg TCDD eq./g product) | | µg PFOA eq/g pr. |
| 1 (A) | Mosses 1 | 2-8-2021 | TW-CZ21-MOS-01 | 3400 | 0.42 | 0.29 | 0.13 | 1.7 |
| 2 (B) | Mosses 2 | 2-8-2021 | TW-CZ21-MOS-02 | 1400 | 0.31 | 0.17 | 0.14 | |
| 3 (C) | Mosses 3 | 2-8-2021 | TW-CZ21-MOS-03.0/3 | 420 | 1.60 | 1.20 | 0.40 | 1.7 |
| 5 (F) | Mosses 4 | 2-8-2021 | TW-CZ21-MOS-04 | 980 | 0.53 | 0.31 | 0.22 | |
| 6 (D) | Mosses 5 | 2-8-2021 | TW-CZ21-MOS-05.1/5 | 1000 | 0.26 | 0.18 | 0.08 | |



| Mosses Pilsen, Czech Rep. - 2021 | | | | | Results Mosses Pilsen, Czech Rep. 2021 | | | |
|----------------------------------|-----------|----------|--------------------|----------|--|-------------------------|--------|------------------|
| CZ team locat | Biomarker | sample | TW-REF-NR | Distance | PCDD/F/dl-PCB | PCDD/F | dl-PCB | PFAS (FITC-T4) |
| Delivering nr | | date | | (m) | DR CALUX | (pg TCDD eq./g product) | | µg PFOA eq/g pr. |
| 1 (A) | Mosses 1 | 2-8-2021 | TW-CZ21-MOS-01 | 3400 | 0.42 | 0.29 | 0.13 | 1.7 |
| 2 (B) | Mosses 2 | 2-8-2021 | TW-CZ21-MOS-02 | 1400 | 0.31 | 0.17 | 0.14 | |
| 3 (C) | Mosses 3 | 2-8-2021 | TW-CZ21-MOS-03.0/3 | 420 | 1.60 | 1.20 | 0.40 | 1.7 |
| 5 (F) | Mosses 4 | 2-8-2021 | TW-CZ21-MOS-04 | 980 | 0.53 | 0.31 | 0.22 | |
| 6 (D) | Mosses 5 | 2-8-2021 | TW-CZ21-MOS-05.1/5 | 1000 | 0.26 | 0.18 | 0.08 | |





| Mosses Pilsen, Czech Rep. - 2021 | | | | | Results Mosses Pilsen, Czech Rep. 2021 | | | |
|----------------------------------|-----------|----------|--------------------|----------|--|-------------------------|--------|------------------|
| CZ team locat | Biomarker | sample | TW-REF-NR | Distance | PCDD/F/dl-PCB | PCDD/F | dl-PCB | PFAS(FITC-T4) |
| Delivering nr | | date | | (m) | DR CALUX | (pg TCDD eq./g product) | | µg PFOA eq/g pr. |
| 1 (A) | Mosses 1 | 2-8-2021 | TW-CZ21-MOS-01 | 3400 | 0.42 | 0.29 | 0.13 | 1.7 |
| 2 (B) | Mosses 2 | 2-8-2021 | TW-CZ21-MOS-02 | 1400 | 0.31 | 0.17 | 0.14 | |
| 3 (C) | Mosses 3 | 2-8-2021 | TW-CZ21-MOS-03.0/3 | 420 | 1.60 | 1.20 | 0.40 | 1.7 |
| 5 (F) | Mosses 4 | 2-8-2021 | TW-CZ21-MOS-04 | 980 | 0.53 | 0.31 | 0.22 | |
| 6 (D) | Mosses 5 | 2-8-2021 | TW-CZ21-MOS-05.1/5 | 1000 | 0.26 | 0.18 | 0.08 | |



Results biomonitoring - Pilsen, Czech Rep. 2021



DR CALUX: Factor 3 elevate dioxins (PCDD/F) in pine needles



PAH CALUX : Factor 87x elevate *ng B[a]P eq. /g product* in pine needles



DR CALUX: Factor 7x more dioxins (PCDD/F) in mosses



FITC-T4: High levels of PFAS in mosses



DR CALUX: 89% of the eggs does not comply EU limit bioassay for dioxins

GC-MS: 50 % of the eggs does not comply the EU limit for safe egg consumption

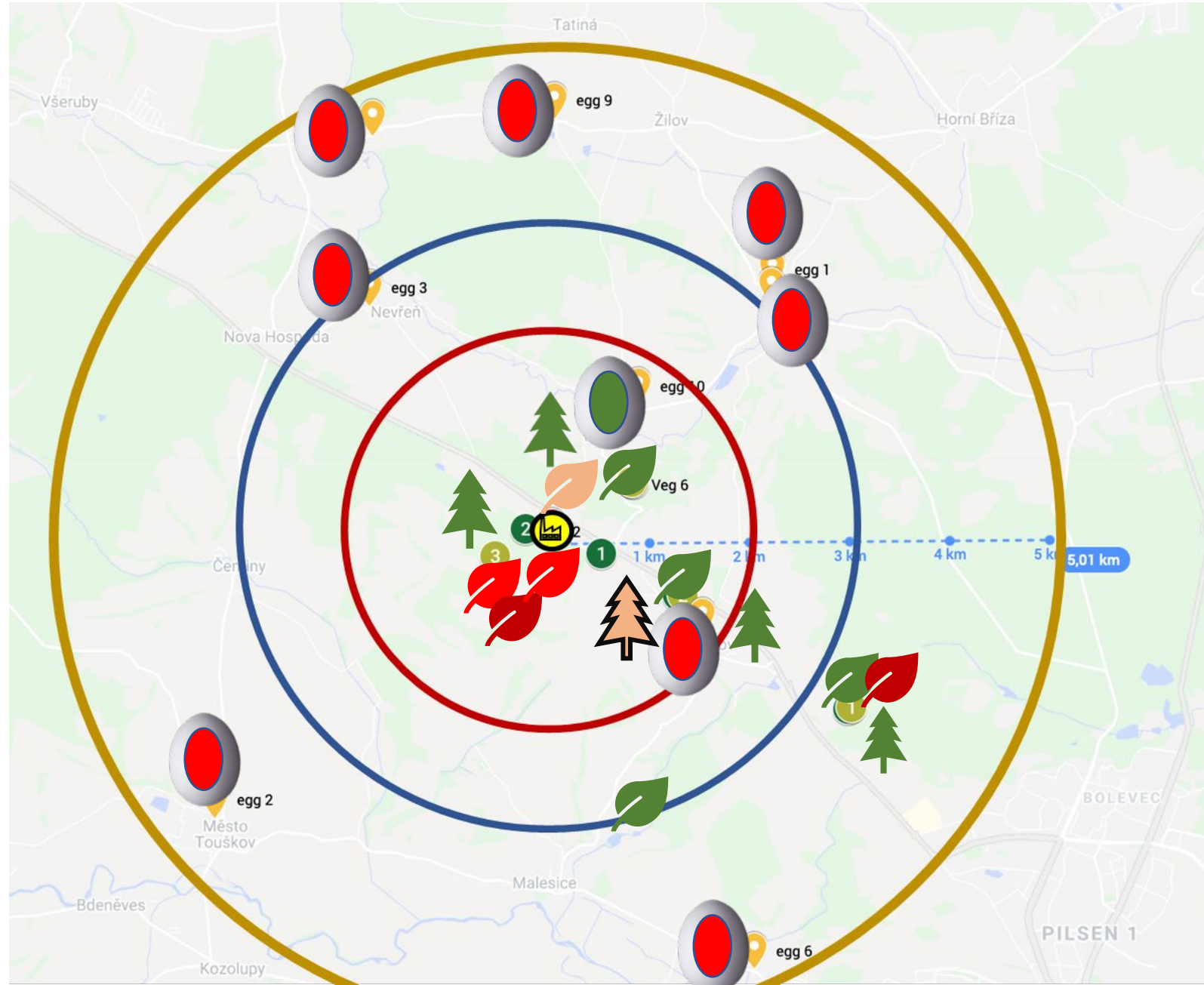
GC-MS: 75 % of the eggs breaches the EU action limit for dl-PCB

GC-MS: 38 % of the eggs breaches the EU action limit for PCDD/F



PFAS CALUX : High levels of PFAS in eggs

GC-MS: Congener patterns dioxins are the same as those from a waste incinerator



| TW indicative scale vegetation | | | TW Indicative scale | TW Indicative scale | EU limit - Eggs | | EU limit - Eggs | EU limit - Eggs | EU limit - Eggs |
|--|--|--|--|---|---------------------------------|--------|------------------------------|------------------------------|------------------------------|
| PCDD/F/dl-PCB | PCDD/F | dL-PCB | PFAS | PAH | PCDD/F/dl-PCB | PCDD/F | PCDD/F/dl-PCB | PCDD/F | dl-PCB |
| DR CALUX <i>pg TCDD eq./g product</i> | DR CALUX <i>pg TCDD eq./g product</i> | DR CALUX <i>pg TCDD eq./g product</i> | FITC-T4/PFAS CALUX <i>µg PFOA eq./g product</i> | PAH CALUX <i>ng Benzo[a]pyrene (B[a]P) eq./g product</i> | DR CALUX <i>pg BEQ/g fat</i> | | GC-MS <i>pg TEQ/g fat</i> | GC-MS <i>pg TEQ/g fat</i> | GC-MS <i>pg TEQ/g fat</i> |
| > 5.0 | > 5.0 | > 5.0 | > 50 | > 500 | | | | | |
| > 2.0 | > 2.0 | > 2.0 | > 20 | > 250 | | | | | |
| > 1.0 | > 1.0 | > 1.0 | > 10 | > 100 | ≥ 3.3 | ≥ 1.7 | ≥ 5.0 | ≥ 2.5 | |
| > 0.5 | > 0.5 | > 0.5 | > 5 | > 10 | | | | > 1.75 | > 1.75 |
| < 0.5 | < 0.5 | < 0.5 | < 5 | < 10 | < 3.3 | < 1.7 | < 5.0 | < 1.75 | < 1.75 |



Analysis report

Client:

Toxicowatch
Abel Arkenbout
info@toxicowatch.org
grote ossenmarkt 18
8861 CP
Harlingen
Nederland

Authorized by:

Snezana Zeljkovic
Principle analyst

Date report (dd-mm-yyyy):

30-08-2021

Responsible person BDS:

Emiel Felzel
Head of Testing Laboratory

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: 26-08-2021

Table 1 sample analysis results

| No. | Client code | Method | Parameter | Result | Conclusion | Cut off | Unit |
|-----|---------------|----------|-----------------------------------|--------|------------|---------|-------------------|
| 1 | TW-CZ21-egg01 | DR CALUX | PCDD/PCDF (BEQ; semi) | 2.1 | suspected | 1.7 | pg BEQ / gram fat |
| 2 | TW-CZ21-egg01 | DR CALUX | PCDD/PCDF and dl-PCBs (BEQ; semi) | 3.8 | suspected | 3.3 | pg BEQ / gram fat |

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

Table 2 sample characteristics

| No. | Client code | BDS code | Matrix | ISO17025 (RvAL401) | Date arrival | Sealed |
|-----|---------------|----------|--------------------|--------------------|--------------|--------|
| 1 | TW-CZ21-egg01 | 41112 | Food, egg(product) | yes | 12-08-2021 | |
| 2 | TW-CZ21-egg01 | 41112 | Food, egg(product) | yes | 12-08-2021 | |

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.

For the method DR CALUX and the sum parameter dl-PCBs (BEQ; semi) the used method is

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Analysis report

Client:

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Authorized by:

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Principle analyst

Date report (dd-mm-yyyy):

30-08-2021

Responsible person BDS:

Emiel Felzel
Head of Testing Laboratory

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: 30-08-2021

Table 1 sample analysis results

| No. | Client code | Method | Parameter | Result | Conclusion | Cut off | Unit |
|-----|---------------|----------|-----------------------------------|--------|------------|---------|-------------------|
| 1 | TW-CZ21-egg02 | DR CALUX | PCDD/PCDF (BEQ; semi) | 10 | suspected | 1.7 | pg BEQ / gram fat |
| 2 | TW-CZ21-egg02 | DR CALUX | PCDD/PCDF and dl-PCBs (BEQ; semi) | 20 | suspected | 3.3 | pg BEQ / gram fat |

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

Table 2 sample characteristics

| No. | Client code | BDS code | Matrix | ISO17025 (RvAL401) | Date arrival | Sealed |
|-----|---------------|----------|--------------------|--------------------|--------------|--------|
| 1 | TW-CZ21-egg02 | 41113 | Food, egg(product) | yes | 12-08-2021 | |
| 2 | TW-CZ21-egg02 | 41113 | Food, egg(product) | yes | 12-08-2021 | |

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.

For the method DR CALUX and the sum parameter dl-PCBs (BEQ; semi) the used method is

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Analysis report

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 Head of Testing Laboratory

Information about report

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If an analysis is accredited by ISO17025 (RvA L401) is indicated by a yes or a no

Date of the performance of the test: 26-08-2021

Table 1 sample analysis results

| No. | Client code | Method | Parameter | Result | Conclusion | Cut off | Unit |
|-----|---------------|----------|-----------------------------------|--------|------------|---------|-------------------|
| 1 | TW-CZ21-egg03 | DR CALUX | PCDD/PCDF (BEQ; semi) | 1.7 | suspected | 1.7 | pg BEQ / gram fat |
| 2 | TW-CZ21-egg03 | DR CALUX | PCDD/PCDF and dl-PCBs (BEQ; semi) | 4.3 | suspected | 3.3 | pg BEQ / gram fat |

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Table 2 sample characteristics

| No. | Client code | BDS code | Matrix | ISO17025 (RvAL401) | Date arrival | Sealed |
|-----|---------------|----------|--------------------|--------------------|--------------|--------|
| 1 | TW-CZ21-egg03 | 41114 | Food, egg(product) | yes | 12-08-2021 | |
| 2 | TW-CZ21-egg03 | 41114 | Food, egg(product) | yes | 12-08-2021 | |

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.

For the method DR CALUX and the sum parameter dl-PCBs (BEQ; semi) the used method is

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Emiel Felzel
 Head of Testing Laboratory

Information about report

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Date of the performance of the test: 26-08-2021

Table 1 sample analysis results

| No. | Client code | Method | Parameter | Result | Conclusion | Cut off | Unit |
|-----|---------------|----------|-----------------------------------|--------|------------|---------|-------------------|
| 1 | TW-CZ21-egg04 | DR CALUX | PCDD/PCDF (BEQ; semi) | 1.3 | compliant | 1.7 | pg BEQ / gram fat |
| 2 | TW-CZ21-egg04 | DR CALUX | PCDD/PCDF and dl-PCBs (BEQ; semi) | 3.3 | compliant | 3.3 | pg BEQ / gram fat |

Table 2 sample characteristics

| No. | Client code | BDS code | Matrix | ISO17025 (RvA L401) | Date arrival | Sealed |
|-----|---------------|----------|--------------------|---------------------|--------------|--------|
| 1 | TW-CZ21-egg04 | 41115 | Food, egg(product) | yes | 12-08-2021 | |
| 2 | TW-CZ21-egg04 | 41115 | Food, egg(product) | yes | 12-08-2021 | |

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.

For the method DR CALUX and the sum parameter dl-PCBs (BEQ; semi) the used method is

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Analysis report

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Responsible person BDS:

Emiel Felzel
 Head of Testing Laboratory

Information about report

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Results are given in table 1.

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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: 26-08-2021

Table 1 sample analysis results

| No. | Client code | Method | Parameter | Result | Conclusion | Cut off | Unit |
|-----|---------------|----------|-----------------------------------|--------|------------|---------|-------------------|
| 1 | TW-CZ21-egg05 | DR CALUX | PCDD/PCDF (BEQ; semi) | 11 | suspected | 1.7 | pg BEQ / gram fat |
| 2 | TW-CZ21-egg05 | DR CALUX | PCDD/PCDF and dl-PCBs (BEQ; semi) | 18 | suspected | 3.3 | pg BEQ / gram fat |

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Table 2 sample characteristics

| No. | Client code | BDS code | Matrix | ISO17025 (RvAL401) | Date arrival | Sealed |
|-----|---------------|----------|--------------------|--------------------|--------------|--------|
| 1 | TW-CZ21-egg05 | 41116 | Food, egg(product) | yes | 12-08-2021 | |
| 2 | TW-CZ21-egg05 | 41116 | Food, egg(product) | yes | 12-08-2021 | |

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.

For the method DR CALUX and the sum parameter dl-PCBs (BEQ; semi) the used method is

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Analysis report

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Responsible person BDS:

Emiel Felzel
 Head of Testing Laboratory

Information about report

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If an analysis is accredited by ISO17025 (RvA L401) is indicated by a yes or a no

Date of the performance of the test: 26-08-2021

Table 1 sample analysis results

| No. | Client code | Method | Parameter | Result | Conclusion | Cut off | Unit |
|-----|---------------|----------|-----------------------------------|--------|------------|---------|-------------------|
| 1 | TW-CZ21-egg06 | DR CALUX | PCDD/PCDF (BEQ; semi) | 2.5 | suspected | 1.7 | pg BEQ / gram fat |
| 2 | TW-CZ21-egg06 | DR CALUX | PCDD/PCDF and dl-PCBs (BEQ; semi) | 7.8 | suspected | 3.3 | pg BEQ / gram fat |

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Table 2 sample characteristics

| No. | Client code | BDS code | Matrix | ISO17025 (RvAL401) | Date arrival | Sealed |
|-----|---------------|----------|--------------------|--------------------|--------------|--------|
| 1 | TW-CZ21-egg06 | 41117 | Food, egg(product) | yes | 12-08-2021 | |
| 2 | TW-CZ21-egg06 | 41117 | Food, egg(product) | yes | 12-08-2021 | |

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.

For the method DR CALUX and the sum parameter dl-PCBs (BEQ; semi) the used method is

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Analysis report

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Date report (dd-mm-yyyy):

30-08-2021

Responsible person BDS:

Emiel Felzel
 Head of Testing Laboratory

Information about report

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The measurement uncertainty for CALUX method is typically below 30%. For the calculation a coverage factor of 1 is used.

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Date of the performance of the test: 26-08-2021

Table 1 sample analysis results

| No. | Client code | Method | Parameter | Result | Conclusion | Cut off | Unit |
|-----|---------------|----------|-----------------------------------|--------|------------|---------|-------------------|
| 1 | TW-CZ21-egg08 | DR CALUX | PCDD/PCDF (BEQ; semi) | 2.1 | suspected | 1.7 | pg BEQ / gram fat |
| 2 | TW-CZ21-egg08 | DR CALUX | PCDD/PCDF and dl-PCBs (BEQ; semi) | 9.8 | suspected | 3.3 | pg BEQ / gram fat |

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Table 2 sample characteristics

| No. | Client code | BDS code | Matrix | ISO17025 (RvAL401) | Date arrival | Sealed |
|-----|---------------|----------|--------------------|--------------------|--------------|--------|
| 1 | TW-CZ21-egg08 | 41119 | Food, egg(product) | yes | 12-08-2021 | |
| 2 | TW-CZ21-egg08 | 41119 | Food, egg(product) | yes | 12-08-2021 | |

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.

For the method DR CALUX and the sum parameter dl-PCBs (BEQ; semi) the used method is

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Responsible person BDS:

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Head of Testing Laboratory

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Date of the performance of the test: 26-08-2021

Table 1 sample analysis results

| No. | Client code | Method | Parameter | Result | Conclusion | Cut off | Unit |
|-----|---------------|----------|-----------------------------------|----------|------------|---------|-------------------|
| 1 | TW-CZ21-egg07 | DR CALUX | PCDD/PCDF (BEQ; semi) | LOQ <0.3 | compliant | 1.7 | pg BEQ / gram fat |
| 2 | TW-CZ21-egg07 | DR CALUX | PCDD/PCDF and dl-PCBs (BEQ; semi) | 0.71 | compliant | 3.3 | pg BEQ / gram fat |

For results below the limit of quantification (LOQ), behind the less than sign the limit of quantification is given

Table 2 sample characteristics

| No. | Client code | BDS code | Matrix | ISO17025 (RvAL401) | Date arrival | Sealed |
|-----|---------------|----------|--------------------|--------------------|--------------|--------|
| 1 | TW-CZ21-egg07 | 41118 | Food, egg(product) | yes | 12-08-2021 | |
| 2 | TW-CZ21-egg07 | 41118 | Food, egg(product) | yes | 12-08-2021 | |

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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.

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| No. | Client code | Method | Parameter | Result | Conclusion | Cut off | Unit |
|-----|---------------|----------|-----------------------------------|--------|------------|---------|-------------------|
| 1 | TW-CZ21-egg09 | DR CALUX | PCDD/PCDF (BEQ; semi) | 0.66 | compliant | 1.7 | pg BEQ / gram fat |
| 2 | TW-CZ21-egg09 | DR CALUX | PCDD/PCDF and dl-PCBs (BEQ; semi) | 3.4 | suspected | 3.3 | pg BEQ / gram fat |

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

Table 2 sample characteristics

| No. | Client code | BDS code | Matrix | ISO17025 (RvAL401) | Date arrival | Sealed |
|-----|---------------|----------|--------------------|--------------------|--------------|--------|
| 1 | TW-CZ21-egg09 | 41120 | Food, egg(product) | yes | 12-08-2021 | |
| 2 | TW-CZ21-egg09 | 41120 | Food, egg(product) | yes | 12-08-2021 | |

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.

For the method DR CALUX and the sum parameter dl-PCBs (BEQ; semi) the used method is

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 (EU) 2015/704 of 30 April 2015.



Analysis report

Client:

Toxicowatch
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Authorized by:

Snezana Zeljkovic
Principle analyst

Date report (dd-mm-yyyy):

26-08-2021

Responsible person BDS:

Emiel Felzel
Head of Testing Laboratory

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: 26-08-2021

Table 1 sample analysis results

| No. | Client code | Method | Parameter | Result | Conclusion | Cut off | Unit |
|-----|---------------|----------|-----------------------------------|--------|------------|---------|-------------------|
| 1 | TW-CZ21-egg10 | DR CALUX | PCDD/PCDF (BEQ; semi) | 0.41 | compliant | 1.7 | pg BEQ / gram fat |
| 2 | TW-CZ21-egg10 | DR CALUX | PCDD/PCDF and dl-PCBs (BEQ; semi) | 0.95 | compliant | 3.3 | pg BEQ / gram fat |

Table 2 sample characteristics

| No. | Client code | BDS code | Matrix | ISO17025 (RvA L401) | Date arrival | Sealed |
|-----|---------------|----------|--------------------|---------------------|--------------|--------|
| 1 | TW-CZ21-egg10 | 41121 | Food, egg(product) | yes | 12-08-2021 | |
| 2 | TW-CZ21-egg10 | 41121 | Food, egg(product) | yes | 12-08-2021 | |

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.

For the method DR CALUX and the sum parameter dl-PCBs (BEQ; semi) the used method is

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 (EU) 2015/704 of 30 April 2015.

Analysis report

Client:

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Authorized by:

Snezana Zeljkovic
 Principle analyst

Date report (dd-mm-yyyy):

26-08-2021

Responsible person BDS:

Emiel Felzel
 Head of Testing Laboratory



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.

Accreditation ISO 17025 (RvA L401) is not applicable for activities described in this report

Date of the performance of the test: 26-08-2021

Table 1 sample analysis results

| No. | Client code | Method | Parameter | Result | Unit |
|-----|--------------------------|----------|---------------------------|-----------|-----------------------|
| 1 | TW-CZ21-PS-VEG01 | DR CALUX | dl-PCBs (separated TEQ) | 0.27 | pg TEQ / gram product |
| 2 | TW-CZ21-PS-VEG01 | DR CALUX | PCDD/PCDF (separated TEQ) | 0.094 | pg TEQ / gram product |
| 3 | TW-CZ21-PS-VEG02 | DR CALUX | dl-PCBs (separated TEQ) | 0.10 | pg TEQ / gram product |
| 4 | TW-CZ21-PS-VEG02 | DR CALUX | PCDD/PCDF (separated TEQ) | LOQ <0.06 | pg TEQ / gram product |
| 5 | TW-CZ21-PS-VEG04 | DR CALUX | dl-PCBs (separated TEQ) | 0.13 | pg TEQ / gram product |
| 6 | TW-CZ21-PS-VEG04 | DR CALUX | PCDD/PCDF (separated TEQ) | LOQ <0.06 | pg TEQ / gram product |
| 7 | TW-CZ21-PS-VEG05 | DR CALUX | dl-PCBs (separated TEQ) | 0.072 | pg TEQ / gram product |
| 8 | TW-CZ21-PS-VEG05 | DR CALUX | PCDD/PCDF (separated TEQ) | LOQ <0.05 | pg TEQ / gram product |
| 9 | TW-CZ21-PS-VEG06 | DR CALUX | dl-PCBs (separated TEQ) | 0.17 | pg TEQ / gram product |
| 10 | TW-CZ21-PS-VEG06 | DR CALUX | PCDD/PCDF (separated TEQ) | LOQ <0.05 | pg TEQ / gram product |
| 11 | TW-CZ21-MOS-01 | DR CALUX | dl-PCBs (separated TEQ) | 0.13 | pg TEQ / gram product |
| 12 | TW-CZ21-MOS-01 | DR CALUX | PCDD/PCDF (separated TEQ) | 0.29 | pg TEQ / gram product |
| 13 | TW-CZ21-MOS-02 | DR CALUX | dl-PCBs (separated TEQ) | 0.14 | pg TEQ / gram product |
| 14 | TW-CZ21-MOS-02 | DR CALUX | PCDD/PCDF (separated TEQ) | 0.17 | pg TEQ / gram product |
| 15 | TW-CZ21-MOS-03.0/3.1/3.2 | DR CALUX | dl-PCBs (separated TEQ) | 0.40 | pg TEQ / gram product |
| 16 | TW-CZ21-MOS-03.0/3.1/3.2 | DR CALUX | PCDD/PCDF (separated TEQ) | 1.2 | pg TEQ / gram product |
| 17 | TW-CZ21-MOS-04 | DR CALUX | dl-PCBs (separated TEQ) | 0.22 | pg TEQ / gram product |
| 18 | TW-CZ21-MOS-04 | DR CALUX | PCDD/PCDF (separated TEQ) | 0.31 | pg TEQ / gram product |
| 19 | TW-CZ21-MOS-05.1/5.2 | DR CALUX | dl-PCBs (separated TEQ) | 0.080 | pg TEQ / gram product |
| 20 | TW-CZ21-MOS-05.1/5.2 | DR CALUX | PCDD/PCDF (separated TEQ) | 0.18 | pg TEQ / gram product |

For results below the limit of quantification (LOQ), behind the less than sign the limit of quantification is given

Table 2 sample characteristics

| No. | Client code | BDS code | Matrix | ISO17025 (RvAL401) | Date arrival | Sealed |
|-----|------------------|----------|-------------|--------------------|--------------|--------|
| 1 | TW-CZ21-PS-VEG01 | 41102 | Not defined | no | 12-08-2021 | |
| 2 | TW-CZ21-PS-VEG01 | 41102 | Not defined | no | 12-08-2021 | |
| 3 | TW-CZ21-PS-VEG02 | 41103 | Not defined | no | 12-08-2021 | |
| 4 | TW-CZ21-PS-VEG02 | 41103 | Not defined | no | 12-08-2021 | |
| 5 | TW-CZ21-PS-VEG04 | 41104 | Not defined | no | 12-08-2021 | |
| 6 | TW-CZ21-PS-VEG04 | 41104 | Not defined | no | 12-08-2021 | |
| 7 | TW-CZ21-PS-VEG05 | 41105 | Not defined | no | 12-08-2021 | |
| 8 | TW-CZ21-PS-VEG05 | 41105 | Not defined | no | 12-08-2021 | |
| 9 | TW-CZ21-PS-VEG06 | 41106 | Not defined | no | 12-08-2021 | |
| 10 | TW-CZ21-PS-VEG06 | 41106 | Not defined | no | 12-08-2021 | |
| 11 | TW-CZ21-MOS-01 | 41107 | Not defined | no | 12-08-2021 | |
| 12 | TW-CZ21-MOS-01 | 41107 | Not defined | no | 12-08-2021 | |

| | | | | | |
|----|--------------------------|-------|-------------|----|------------|
| 13 | TW-CZ21-MOS-02 | 41108 | Not defined | no | 12-08-2021 |
| 14 | TW-CZ21-MOS-02 | 41108 | Not defined | no | 12-08-2021 |
| 15 | TW-CZ21-MOS-03.0/3.1/3.2 | 41109 | Not defined | no | 12-08-2021 |
| 16 | TW-CZ21-MOS-03.0/3.1/3.2 | 41109 | Not defined | no | 12-08-2021 |
| 17 | TW-CZ21-MOS-04 | 41110 | Not defined | no | 12-08-2021 |
| 18 | TW-CZ21-MOS-04 | 41110 | Not defined | no | 12-08-2021 |
| 19 | TW-CZ21-MOS-05.1/5.2 | 41111 | Not defined | no | 12-08-2021 |
| 20 | TW-CZ21-MOS-05.1/5.2 | 41111 | Not defined | no | 12-08-2021 |

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 futher clean-up is done with a florisil column; The cleaned extracts are dissolved in DMSO; Seperation is done with alumina; ; the DR CALUX Analysis is done according to p-bds-051extraction with organic solvents; the extracts are cleaned on an acid silica column and separation is done with a alumina column. The cleaned extracts are dissolved in DMSO. The DR CALUX activity is determined (24h exposure) and benchmar



Analysis report

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Date report (dd-mm-yyyy):

03-09-2021

Responsible person BDS:

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Head of Testing Laboratory

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 (EU) 2015/704 of 30 April 2015.

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 41201
Client identification TW-CZ21-egg01
Sample received on 27-08-2021
Start of test 27-08-2021
End of test 01-09-2021
Matrix Food, egg(product)

Test results:

WHO sum parameters (accredited under RvA L401)

| | | | | |
|---|-----|-------------------|------|-----|
| WHO PCDD/F TEQ excl. LOQ 2005 | 2.2 | pg TEQ / gram fat | U+/- | 24% |
| WHO PCDD/F TEQ incl. LOQ 2005 | 2.2 | pg TEQ / gram fat | U+/- | 24% |
| WHO dl-PCBs TEQ excl. LOQ 2005 | 1.4 | pg TEQ / gram fat | U+/- | 24% |
| WHO dl-PCBs TEQ incl. LOQ 2005 | 1.4 | pg TEQ / gram fat | U+/- | 24% |
| WHO PCDD/F + dl-PCBs TEQ excl. LOQ 2005 | 3.6 | pg TEQ / gram fat | U+/- | 23% |
| WHO PCDD/F + dl-PCBs TEQ incl. LOQ 2005 | 3.6 | pg TEQ / gram fat | U+/- | 23% |

Dioxins/furans (accredited under RvA L401)

| | | | | |
|---|------|---------------|------|-----|
| 2,3,7,8-Tetrachlorodibenzo-p-dioxin | 0.29 | pg / gram fat | U+/- | 44% |
| 1,2,3,7,8-Pentachlorodibenzo-p-dioxin | 0.76 | pg / gram fat | U+/- | 31% |
| 1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin | 0.74 | pg / gram fat | U+/- | 44% |
| 1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin | 1.3 | pg / gram fat | U+/- | 46% |
| 1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin | 0.76 | pg / gram fat | U+/- | 41% |
| 1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin | 3.8 | pg / gram fat | U+/- | 34% |
| Octachlorodibenzo-p-dioxin | 6.4 | pg / gram fat | U+/- | 49% |
| 2,3,7,8-Tetrachlorodibenzofuran | 1.2 | pg / gram fat | U+/- | 27% |
| 1,2,3,7,8-Pentachlorodibenzofuran | 0.71 | pg / gram fat | U+/- | 31% |
| 2,3,4,7,8-Pentachlorodibenzofuran | 0.80 | pg / gram fat | U+/- | 29% |
| 1,2,3,4,7,8-Hexachlorodibenzofuran | 0.91 | pg / gram fat | U+/- | 37% |
| 1,2,3,6,7,8-Hexachlorodibenzofuran | 0.82 | pg / gram fat | U+/- | 25% |
| 1,2,3,7,8,9-Hexachlorodibenzofuran | 0.79 | pg / gram fat | U+/- | 41% |
| 2,3,4,6,7,8-Hexachlorodibenzofuran | 0.52 | pg / gram fat | U+/- | 32% |
| 1,2,3,4,6,7,8-Heptachlorodibenzofuran | 9.1 | pg / gram fat | U+/- | 25% |
| 1,2,3,4,7,8,9-Heptachlorodibenzofuran | 0.57 | pg / gram fat | U+/- | 28% |
| Octachlorodibenzofuran | 1.8 | pg / gram fat | U+/- | 37% |

dl-PCBs (accredited under RvA L401)

| | | | | |
|---|----------|---------------|------|-----|
| 3,3',4,4'-Tetrachlorobiphenyl (#77) | 12 | pg / gram fat | U+/- | 39% |
| 3,4,4',5-Tetrachlorobiphenyl (#81) | LOQ (<2) | pg / gram fat | U+/- | 32% |
| 3,3',4,4',5-Pentachlorobiphenyl (#126) | 13 | pg / gram fat | U+/- | 26% |
| 3,3',4,4',5,5'-Hexachlorobiphenyl (#169) | 1.6 | pg / gram fat | U+/- | 53% |
| 2,3,3',4,4'-Pentachlorobiphenyl (#105) | 100 | pg / gram fat | U+/- | 51% |
| 2,3,4,4',5-Pentachlorobiphenyl (#114) | 7.6 | pg / gram fat | U+/- | 32% |
| 2,3',4,4',5-Pentachlorobiphenyl (#118) | 470 | pg / gram fat | U+/- | 44% |
| 2,3',4,4',5'-Pentachlorobiphenyl (#123) | LOQ (<2) | pg / gram fat | U+/- | 36% |
| 2,3,3',4,4',5-Hexachlorobiphenyl (#156) | 150 | pg / gram fat | U+/- | 36% |
| 2,3,3',4,4',5'-Hexachlorobiphenyl (#157) | 17 | pg / gram fat | U+/- | 37% |
| 2,3',4,4',5,5'-Hexachlorobiphenyl (#167) | 67 | pg / gram fat | U+/- | 35% |
| 2,3,3',4,4',5,5'-Heptachlorobiphenyl (#189) | 25 | pg / gram fat | U+/- | 37% |



Analysis report

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Authorized by:

Snezana Zeljkovic

Date report (dd-mm-yyyy):

08-09-2021

Responsible person BDS:

Emiel Felzel
 Head of Testing Laboratory

Information about report

This report replace version 1

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 (EU) 2015/704 of 30 April 2015.

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 41202
 Client identification TW-CZ21-egg02
 Sample recieved on 27-08-2021
 Start of test 27-08-2021
 End of test 01-09-2021
 Matrix Food, egg(product)

Reason change (identification change at the end of report in table 1):

In the original analysis the internal standard measurement experienced interference for PCB 77 and 81. This caused artificial high recovery values. This is resolved in the second analysis.

Judgement

Non-compliant for maximal level limit (expressed as WHO PCDD/F TEQ) taking into account expanded measurement uncertainty.
 Sample TW-CZ21-egg02 is above the maximal level of 2.5 pg TEQ / gram fat.

Non-compliant for maximal level limit (expressed as WHO PCDD/F + dl-PCBs TEQ) taking into account expanded measurement uncertainty.
 Sample TW-CZ21-egg02 is above the maximal level of 5 pg TEQ / gram fat.

Test results:

WHO sum parameters (accredited under RvA L401)

| | | | | |
|---|-----|-------------------|------|-----|
| WHO PCDD/F TEQ excl. LOQ 2005 | 6.7 | pg TEQ / gram fat | U+/- | 24% |
| WHO PCDD/F TEQ incl. LOQ 2005 | 6.7 | pg TEQ / gram fat | U+/- | 24% |
| WHO dl-PCBs TEQ excl. LOQ 2005 | 16 | pg TEQ / gram fat | U+/- | 24% |
| WHO dl-PCBs TEQ incl. LOQ 2005 | 16 | pg TEQ / gram fat | U+/- | 24% |
| WHO PCDD/F + dl-PCBs TEQ excl. LOQ 2005 | 22 | pg TEQ / gram fat | U+/- | 23% |
| WHO PCDD/F + dl-PCBs TEQ incl. LOQ 2005 | 22 | pg TEQ / gram fat | U+/- | 23% |

Dioxins/furans (accredited under RvA L401)

| | | | | |
|---|------|---------------|------|-----|
| 2,3,7,8-Tetrachlorodibenzo-p-dioxin | 0.37 | pg / gram fat | U+/- | 44% |
| 1,2,3,7,8-Pentachlorodibenzo-p-dioxin | 1.5 | pg / gram fat | U+/- | 31% |
| 1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin | 1.5 | pg / gram fat | U+/- | 44% |
| 1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin | 4.3 | pg / gram fat | U+/- | 46% |
| 1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin | 1.8 | pg / gram fat | U+/- | 41% |
| 1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin | 14 | pg / gram fat | U+/- | 34% |

| | | | | |
|---------------------------------------|------|---------------|------|-----|
| Octachlorodibenzo-p-dioxin | 20 | pg / gram fat | U+/- | 49% |
| 2,3,7,8-Tetrachlorodibenzofuran | 6.4 | pg / gram fat | U+/- | 27% |
| 1,2,3,7,8-Pentachlorodibenzofuran | 3.0 | pg / gram fat | U+/- | 31% |
| 2,3,4,7,8-Pentachlorodibenzofuran | 5.0 | pg / gram fat | U+/- | 29% |
| 1,2,3,4,7,8-Hexachlorodibenzofuran | 3.2 | pg / gram fat | U+/- | 37% |
| 1,2,3,6,7,8-Hexachlorodibenzofuran | 5.3 | pg / gram fat | U+/- | 25% |
| 1,2,3,7,8,9-Hexachlorodibenzofuran | 0.37 | pg / gram fat | U+/- | 41% |
| 2,3,4,6,7,8-Hexachlorodibenzofuran | 4.7 | pg / gram fat | U+/- | 32% |
| 1,2,3,4,6,7,8-Heptachlorodibenzofuran | 42 | pg / gram fat | U+/- | 25% |
| 1,2,3,4,7,8,9-Heptachlorodibenzofuran | 0.41 | pg / gram fat | U+/- | 28% |
| Octachlorodibenzofuran | 1.8 | pg / gram fat | U+/- | 37% |

dl-PCBs (accredited under RvA L401)

| | | | | |
|---|----------|---------------|------|-----|
| 3,3',4,4'-Tetrachlorobiphenyl (#77) | 270 | pg / gram fat | U+/- | 39% |
| 3,4,4',5-Tetrachlorobiphenyl (#81) | 12 | pg / gram fat | U+/- | 32% |
| 3,3',4,4',5-Pentachlorobiphenyl (#126) | 150 | pg / gram fat | U+/- | 26% |
| 3,3',4,4',5,5'-Hexachlorobiphenyl (#169) | 20 | pg / gram fat | U+/- | 53% |
| 2,3,3',4,4'-Pentachlorobiphenyl (#105) | 840 | pg / gram fat | U+/- | 51% |
| 2,3,4,4',5-Pentachlorobiphenyl (#114) | 44 | pg / gram fat | U+/- | 32% |
| 2,3',4,4',5-Pentachlorobiphenyl (#118) | 5400 | pg / gram fat | U+/- | 44% |
| 2,3',4,4',5'-Pentachlorobiphenyl (#123) | LOQ (<2) | pg / gram fat | U+/- | 36% |
| 2,3,3',4,4',5-Hexachlorobiphenyl (#156) | 3200 | pg / gram fat | U+/- | 36% |
| 2,3,3',4,4',5'-Hexachlorobiphenyl (#157) | 400 | pg / gram fat | U+/- | 37% |
| 2,3',4,4',5,5'-Hexachlorobiphenyl (#167) | 1200 | pg / gram fat | U+/- | 35% |
| 2,3,3',4,4',5,5'-Heptachlorobiphenyl (#189) | 640 | pg / gram fat | U+/- | 37% |

Recovery Dioxins/furans

| | |
|---|-------|
| 2,3,7,8-Tetrachlorodibenzo-p-dioxin | 39.5% |
| 1,2,3,7,8-Pentachlorodibenzo-p-dioxin | 46.3% |
| 1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin | 48.8% |
| 1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin | 41% |
| 1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin | 37.8% |
| 1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin | 54.9% |
| Octachlorodibenzo-p-dioxin | 53% |
| 2,3,7,8-Tetrachlorodibenzofuran | 37.3% |
| 1,2,3,7,8-Pentachlorodibenzofuran | 45.1% |
| 2,3,4,7,8-Pentachlorodibenzofuran | 43.6% |
| 1,2,3,4,7,8-Hexachlorodibenzofuran | 62.7% |
| 1,2,3,6,7,8-Hexachlorodibenzofuran | 36.5% |
| 1,2,3,7,8,9-Hexachlorodibenzofuran | 44.4% |
| 2,3,4,6,7,8-Hexachlorodibenzofuran | 32.8% |
| 1,2,3,4,6,7,8-Heptachlorodibenzofuran | 43.7% |
| 1,2,3,4,7,8,9-Heptachlorodibenzofuran | 48.6% |
| Octachlorodibenzofuran | 43.6% |

Recovery dl-PCBs

| | |
|---|-------|
| 3,3',4,4'-Tetrachlorobiphenyl (#77) | 46% |
| 3,4,4',5-Tetrachlorobiphenyl (#81) | 56.2% |
| 3,3',4,4',5-Pentachlorobiphenyl (#126) | 46.2% |
| 3,3',4,4',5,5'-Hexachlorobiphenyl (#169) | 68.2% |
| 2,3,3',4,4'-Pentachlorobiphenyl (#105) | 53.8% |
| 2,3,4,4',5-Pentachlorobiphenyl (#114) | 50.4% |
| 2,3',4,4',5-Pentachlorobiphenyl (#118) | 54.3% |
| 2,3',4,4',5'-Pentachlorobiphenyl (#123) | 64.7% |
| 2,3,3',4,4',5-Hexachlorobiphenyl (#156) | 62.9% |
| 2,3,3',4,4',5'-Hexachlorobiphenyl (#157) | 62.8% |
| 2,3',4,4',5,5'-Hexachlorobiphenyl (#167) | 49.2% |
| 2,3,3',4,4',5,5'-Heptachlorobiphenyl (#189) | 69.8% |

Table 1 Changes according to previous version report

sample 41202, method GC-MS/MS, parameter 3,3',4,4'-Tetrachlorobiphenyl (#77): Result sample changed from 33 to 270

sample 41202, method GC-MS/MS, parameter 3,4,4',5-Tetrachlorobiphenyl (#81): Result sample changed from 3.1 to 12



Analysis report

Client:

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Abel Arkenbout
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8861 CP
Harlingen
Nederland

Authorized by:

Snezana Zeljkovic

Date report (dd-mm-yyyy):

03-09-2021

Responsible person BDS:

Emiel Felzel
Head of Testing Laboratory

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 (EU) 2015/704 of 30 April 2015.

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 41203
Client identification TW-CZ21-egg03
Sample received on 27-08-2021
Start of test 27-08-2021
End of test 01-09-2021
Matrix Food, egg(product)

Test results:

WHO sum parameters (accredited under RvA L401)

| | | | | |
|---|-----|-------------------|------|-----|
| WHO PCDD/F TEQ excl. LOQ 2005 | 0.6 | pg TEQ / gram fat | U+/- | 24% |
| WHO PCDD/F TEQ incl. LOQ 2005 | 1 | pg TEQ / gram fat | U+/- | 24% |
| WHO dl-PCBs TEQ excl. LOQ 2005 | 1.2 | pg TEQ / gram fat | U+/- | 24% |
| WHO dl-PCBs TEQ incl. LOQ 2005 | 1.2 | pg TEQ / gram fat | U+/- | 24% |
| WHO PCDD/F + dl-PCBs TEQ excl. LOQ 2005 | 1.8 | pg TEQ / gram fat | U+/- | 23% |
| WHO PCDD/F + dl-PCBs TEQ incl. LOQ 2005 | 2.2 | pg TEQ / gram fat | U+/- | 23% |

Dioxins/furans (accredited under RvA L401)

| | | | | |
|---|------------|---------------|------|-----|
| 2,3,7,8-Tetrachlorodibenzo-p-dioxin | LOQ (<0.2) | pg / gram fat | U+/- | 44% |
| 1,2,3,7,8-Pentachlorodibenzo-p-dioxin | LOQ (<0.2) | pg / gram fat | U+/- | 31% |
| 1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin | LOQ (<0.2) | pg / gram fat | U+/- | 44% |
| 1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin | 0.27 | pg / gram fat | U+/- | 46% |
| 1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin | 0.36 | pg / gram fat | U+/- | 41% |
| 1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin | 0.67 | pg / gram fat | U+/- | 34% |
| Octachlorodibenzo-p-dioxin | LOQ (<2) | pg / gram fat | U+/- | 49% |
| 2,3,7,8-Tetrachlorodibenzofuran | 1.5 | pg / gram fat | U+/- | 27% |
| 1,2,3,7,8-Pentachlorodibenzofuran | 0.68 | pg / gram fat | U+/- | 31% |
| 2,3,4,7,8-Pentachlorodibenzofuran | 0.78 | pg / gram fat | U+/- | 29% |
| 1,2,3,4,7,8-Hexachlorodibenzofuran | 0.27 | pg / gram fat | U+/- | 37% |
| 1,2,3,6,7,8-Hexachlorodibenzofuran | 0.51 | pg / gram fat | U+/- | 25% |
| 1,2,3,7,8,9-Hexachlorodibenzofuran | LOQ (<0.2) | pg / gram fat | U+/- | 41% |
| 2,3,4,6,7,8-Hexachlorodibenzofuran | 0.30 | pg / gram fat | U+/- | 32% |
| 1,2,3,4,6,7,8-Heptachlorodibenzofuran | 1.9 | pg / gram fat | U+/- | 25% |
| 1,2,3,4,7,8,9-Heptachlorodibenzofuran | LOQ (<0.2) | pg / gram fat | U+/- | 28% |
| Octachlorodibenzofuran | LOQ (<0.2) | pg / gram fat | U+/- | 37% |

dl-PCBs (accredited under RvA L401)

| | | | | |
|---|----------|---------------|------|-----|
| 3,3',4,4'-Tetrachlorobiphenyl (#77) | 12 | pg / gram fat | U+/- | 39% |
| 3,4,4',5-Tetrachlorobiphenyl (#81) | 9.9 | pg / gram fat | U+/- | 32% |
| 3,3',4,4',5-Pentachlorobiphenyl (#126) | 11 | pg / gram fat | U+/- | 26% |
| 3,3',4,4',5,5'-Hexachlorobiphenyl (#169) | 1.3 | pg / gram fat | U+/- | 53% |
| 2,3,3',4,4'-Pentachlorobiphenyl (#105) | 130 | pg / gram fat | U+/- | 51% |
| 2,3,4,4',5-Pentachlorobiphenyl (#114) | 7.4 | pg / gram fat | U+/- | 32% |
| 2,3',4,4',5-Pentachlorobiphenyl (#118) | 550 | pg / gram fat | U+/- | 44% |
| 2,3',4,4',5'-Pentachlorobiphenyl (#123) | LOQ (<2) | pg / gram fat | U+/- | 36% |
| 2,3,3',4,4',5-Hexachlorobiphenyl (#156) | 180 | pg / gram fat | U+/- | 36% |
| 2,3,3',4,4',5'-Hexachlorobiphenyl (#157) | 20 | pg / gram fat | U+/- | 37% |
| 2,3',4,4',5,5'-Hexachlorobiphenyl (#167) | 77 | pg / gram fat | U+/- | 35% |
| 2,3,3',4,4',5,5'-Heptachlorobiphenyl (#189) | 41 | pg / gram fat | U+/- | 37% |



Analysis report

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Snezana Zeljkovic

Date report (dd-mm-yyyy):

03-09-2021

Responsible person BDS:

Emiel Felzel
Head of Testing Laboratory

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 41204
Client identification TW-CZ21-egg04
Sample received on 27-08-2021
Start of test 27-08-2021
End of test 01-09-2021
Matrix Food, egg(product)

Test results:

WHO sum parameters (accredited under RvA L401)

| | | | | |
|---|------|-------------------|------|-----|
| WHO PCDD/F TEQ excl. LOQ 2005 | 0.49 | pg TEQ / gram fat | U+/- | 24% |
| WHO PCDD/F TEQ incl. LOQ 2005 | 0.95 | pg TEQ / gram fat | U+/- | 24% |
| WHO dl-PCBs TEQ excl. LOQ 2005 | 3 | pg TEQ / gram fat | U+/- | 24% |
| WHO dl-PCBs TEQ incl. LOQ 2005 | 3 | pg TEQ / gram fat | U+/- | 24% |
| WHO PCDD/F + dl-PCBs TEQ excl. LOQ 2005 | 3.5 | pg TEQ / gram fat | U+/- | 23% |
| WHO PCDD/F + dl-PCBs TEQ incl. LOQ 2005 | 4 | pg TEQ / gram fat | U+/- | 23% |

Dioxins/furans (accredited under RvA L401)

| | | | | |
|---|------------|---------------|------|-----|
| 2,3,7,8-Tetrachlorodibenzo-p-dioxin | LOQ (<0.2) | pg / gram fat | U+/- | 44% |
| 1,2,3,7,8-Pentachlorodibenzo-p-dioxin | LOQ (<0.2) | pg / gram fat | U+/- | 31% |
| 1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin | LOQ (<0.2) | pg / gram fat | U+/- | 44% |
| 1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin | 0.29 | pg / gram fat | U+/- | 46% |
| 1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin | LOQ (<0.2) | pg / gram fat | U+/- | 41% |
| 1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin | 0.77 | pg / gram fat | U+/- | 34% |
| Octachlorodibenzo-p-dioxin | LOQ (<2) | pg / gram fat | U+/- | 49% |
| 2,3,7,8-Tetrachlorodibenzofuran | 1.5 | pg / gram fat | U+/- | 27% |
| 1,2,3,7,8-Pentachlorodibenzofuran | 0.43 | pg / gram fat | U+/- | 31% |
| 2,3,4,7,8-Pentachlorodibenzofuran | 0.69 | pg / gram fat | U+/- | 29% |
| 1,2,3,4,7,8-Hexachlorodibenzofuran | 0.38 | pg / gram fat | U+/- | 37% |
| 1,2,3,6,7,8-Hexachlorodibenzofuran | 0.22 | pg / gram fat | U+/- | 25% |
| 1,2,3,7,8,9-Hexachlorodibenzofuran | LOQ (<0.2) | pg / gram fat | U+/- | 41% |
| 2,3,4,6,7,8-Hexachlorodibenzofuran | 0.20 | pg / gram fat | U+/- | 32% |
| 1,2,3,4,6,7,8-Heptachlorodibenzofuran | 0.71 | pg / gram fat | U+/- | 25% |
| 1,2,3,4,7,8,9-Heptachlorodibenzofuran | LOQ (<0.2) | pg / gram fat | U+/- | 28% |
| Octachlorodibenzofuran | LOQ (<0.2) | pg / gram fat | U+/- | 37% |

dl-PCBs (accredited under RvA L401)

| | | | | |
|---|----------|---------------|------|-----|
| 3,3',4,4'-Tetrachlorobiphenyl (#77) | 24 | pg / gram fat | U+/- | 39% |
| 3,4,4',5-Tetrachlorobiphenyl (#81) | 2.6 | pg / gram fat | U+/- | 32% |
| 3,3',4,4',5-Pentachlorobiphenyl (#126) | 28 | pg / gram fat | U+/- | 26% |
| 3,3',4,4',5,5'-Hexachlorobiphenyl (#169) | 4.5 | pg / gram fat | U+/- | 53% |
| 2,3,3',4,4'-Pentachlorobiphenyl (#105) | 250 | pg / gram fat | U+/- | 51% |
| 2,3,4,4',5-Pentachlorobiphenyl (#114) | 8.1 | pg / gram fat | U+/- | 32% |
| 2,3',4,4',5-Pentachlorobiphenyl (#118) | 1200 | pg / gram fat | U+/- | 44% |
| 2,3',4,4',5'-Pentachlorobiphenyl (#123) | LOQ (<2) | pg / gram fat | U+/- | 36% |
| 2,3,3',4,4',5-Hexachlorobiphenyl (#156) | 970 | pg / gram fat | U+/- | 36% |
| 2,3,3',4,4',5'-Hexachlorobiphenyl (#157) | 62 | pg / gram fat | U+/- | 37% |
| 2,3',4,4',5,5'-Hexachlorobiphenyl (#167) | 470 | pg / gram fat | U+/- | 35% |
| 2,3,3',4,4',5,5'-Heptachlorobiphenyl (#189) | 310 | pg / gram fat | U+/- | 37% |



Analysis report

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Snezana Zeljkovic

Date report (dd-mm-yyyy):

03-09-2021

Responsible person BDS:

Emiel Felzel
Head of Testing Laboratory

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 (EU) 2015/704 of 30 April 2015.

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 41205
Client identification TW-CZ21-egg05
Sample received on 27-08-2021
Start of test 27-08-2021
End of test 01-09-2021
Matrix Food, egg(product)

Judgement

Non-compliant for maximal level limit (expressed as WHO PCDD/F TEQ) taking into account expanded measurement uncertainty.
Sample TW-CZ21-egg05 is above the maximal level of 2.5 pg TEQ / gram fat.

Non-compliant for maximal level limit (expressed as WHO PCDD/F + dl-PCBs TEQ) taking into account expanded measurement uncertainty.
Sample TW-CZ21-egg05 is above the maximal level of 5 pg TEQ / gram fat.

Test results:

WHO sum parameters (accredited under RvA L401)

| | | | | |
|---|-----|-------------------|------|-----|
| WHO PCDD/F TEQ excl. LOQ 2005 | 8.9 | pg TEQ / gram fat | U+/- | 24% |
| WHO PCDD/F TEQ incl. LOQ 2005 | 8.9 | pg TEQ / gram fat | U+/- | 24% |
| WHO dl-PCBs TEQ excl. LOQ 2005 | 5 | pg TEQ / gram fat | U+/- | 24% |
| WHO dl-PCBs TEQ incl. LOQ 2005 | 5 | pg TEQ / gram fat | U+/- | 24% |
| WHO PCDD/F + dl-PCBs TEQ excl. LOQ 2005 | 14 | pg TEQ / gram fat | U+/- | 23% |
| WHO PCDD/F + dl-PCBs TEQ incl. LOQ 2005 | 14 | pg TEQ / gram fat | U+/- | 23% |

Dioxins/furans (accredited under RvA L401)

| | | | | |
|---|------|---------------|------|-----|
| 2,3,7,8-Tetrachlorodibenzo-p-dioxin | 0.33 | pg / gram fat | U+/- | 44% |
| 1,2,3,7,8-Pentachlorodibenzo-p-dioxin | 2.2 | pg / gram fat | U+/- | 31% |
| 1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin | 2.2 | pg / gram fat | U+/- | 44% |
| 1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin | 3.4 | pg / gram fat | U+/- | 46% |
| 1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin | 1.9 | pg / gram fat | U+/- | 41% |
| 1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin | 6.7 | pg / gram fat | U+/- | 34% |
| Octachlorodibenzo-p-dioxin | 5.6 | pg / gram fat | U+/- | 49% |
| 2,3,7,8-Tetrachlorodibenzofuran | 3.8 | pg / gram fat | U+/- | 27% |
| 1,2,3,7,8-Pentachlorodibenzofuran | 4.4 | pg / gram fat | U+/- | 31% |
| 2,3,4,7,8-Pentachlorodibenzofuran | 6.8 | pg / gram fat | U+/- | 29% |
| 1,2,3,4,7,8-Hexachlorodibenzofuran | 9.8 | pg / gram fat | U+/- | 37% |

| | | | | |
|---------------------------------------|------|---------------|------|-----|
| 1,2,3,6,7,8-Hexachlorodibenzofuran | 8.2 | pg / gram fat | U+/- | 25% |
| 1,2,3,7,8,9-Hexachlorodibenzofuran | 0.31 | pg / gram fat | U+/- | 41% |
| 2,3,4,6,7,8-Hexachlorodibenzofuran | 11 | pg / gram fat | U+/- | 32% |
| 1,2,3,4,6,7,8-Heptachlorodibenzofuran | 16 | pg / gram fat | U+/- | 25% |
| 1,2,3,4,7,8,9-Heptachlorodibenzofuran | 0.77 | pg / gram fat | U+/- | 28% |
| Octachlorodibenzofuran | 1.3 | pg / gram fat | U+/- | 37% |

dl-PCBs (accredited under RvA L401)

| | | | | |
|---|----------|---------------|------|-----|
| 3,3',4,4'-Tetrachlorobiphenyl (#77) | 37 | pg / gram fat | U+/- | 39% |
| 3,4,4',5-Tetrachlorobiphenyl (#81) | 4.6 | pg / gram fat | U+/- | 32% |
| 3,3',4,4',5-Pentachlorobiphenyl (#126) | 45 | pg / gram fat | U+/- | 26% |
| 3,3',4,4',5,5'-Hexachlorobiphenyl (#169) | 14 | pg / gram fat | U+/- | 53% |
| 2,3,3',4,4'-Pentachlorobiphenyl (#105) | 250 | pg / gram fat | U+/- | 51% |
| 2,3,4,4',5-Pentachlorobiphenyl (#114) | 16 | pg / gram fat | U+/- | 32% |
| 2,3',4,4',5-Pentachlorobiphenyl (#118) | 1100 | pg / gram fat | U+/- | 44% |
| 2,3',4,4',5'-Pentachlorobiphenyl (#123) | LOQ (<2) | pg / gram fat | U+/- | 36% |
| 2,3,3',4,4',5-Hexachlorobiphenyl (#156) | 570 | pg / gram fat | U+/- | 36% |
| 2,3,3',4,4',5'-Hexachlorobiphenyl (#157) | 85 | pg / gram fat | U+/- | 37% |
| 2,3',4,4',5,5'-Hexachlorobiphenyl (#167) | 410 | pg / gram fat | U+/- | 35% |
| 2,3,3',4,4',5,5'-Heptachlorobiphenyl (#189) | 120 | pg / gram fat | U+/- | 37% |

Recovery Dioxins/furans

| | |
|---|-------|
| 2,3,7,8-Tetrachlorodibenzo-p-dioxin | 46.5% |
| 1,2,3,7,8-Pentachlorodibenzo-p-dioxin | 51.4% |
| 1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin | 72.3% |
| 1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin | 71.8% |
| 1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin | 64.4% |
| 1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin | 78.3% |
| Octachlorodibenzo-p-dioxin | 72.1% |
| 2,3,7,8-Tetrachlorodibenzofuran | 49.2% |
| 1,2,3,7,8-Pentachlorodibenzofuran | 59.1% |
| 2,3,4,7,8-Pentachlorodibenzofuran | 61.6% |
| 1,2,3,4,7,8-Hexachlorodibenzofuran | 56.3% |
| 1,2,3,6,7,8-Hexachlorodibenzofuran | 54.3% |
| 1,2,3,7,8,9-Hexachlorodibenzofuran | 60.9% |
| 2,3,4,6,7,8-Hexachlorodibenzofuran | 64.5% |
| 1,2,3,4,6,7,8-Heptachlorodibenzofuran | 69.4% |
| 1,2,3,4,7,8,9-Heptachlorodibenzofuran | 67.2% |
| Octachlorodibenzofuran | 61.5% |

Recovery dl-PCBs

| | |
|---|-------|
| 3,3',4,4'-Tetrachlorobiphenyl (#77) | 58.6% |
| 3,4,4',5-Tetrachlorobiphenyl (#81) | 60.1% |
| 3,3',4,4',5-Pentachlorobiphenyl (#126) | 66.9% |
| 3,3',4,4',5,5'-Hexachlorobiphenyl (#169) | 69.3% |
| 2,3,3',4,4'-Pentachlorobiphenyl (#105) | 70.6% |
| 2,3,4,4',5-Pentachlorobiphenyl (#114) | 58.5% |
| 2,3',4,4',5-Pentachlorobiphenyl (#118) | 66.9% |
| 2,3',4,4',5'-Pentachlorobiphenyl (#123) | 94.6% |
| 2,3,3',4,4',5-Hexachlorobiphenyl (#156) | 86% |
| 2,3,3',4,4',5'-Hexachlorobiphenyl (#157) | 77.1% |
| 2,3',4,4',5,5'-Hexachlorobiphenyl (#167) | 63.4% |
| 2,3,3',4,4',5,5'-Heptachlorobiphenyl (#189) | 93.5% |



Analysis report

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Snezana Zeljkovic

Date report (dd-mm-yyyy):

03-09-2021

Responsible person BDS:

Emiel Felzel
Head of Testing Laboratory

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 (EU) 2015/704 of 30 April 2015.

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 41206
Client identification TW-CZ21-egg06
Sample received on 27-08-2021
Start of test 27-08-2021
End of test 01-09-2021
Matrix Food, egg(product)

Judgement

Non-compliant for maximal level limit (expressed as WHO PCDD/F + dl-PCBs TEQ) taking into account expanded measurement uncertainty. Sample TW-CZ21-egg06 is above the maximal level of 5 pg TEQ / gram fat.

Test results:

WHO sum parameters (accredited under RvA L401)

| | | | | |
|---|-----|-------------------|------|-----|
| WHO PCDD/F TEQ excl. LOQ 2005 | 1.5 | pg TEQ / gram fat | U+/- | 24% |
| WHO PCDD/F TEQ incl. LOQ 2005 | 1.7 | pg TEQ / gram fat | U+/- | 24% |
| WHO dl-PCBs TEQ excl. LOQ 2005 | 7.4 | pg TEQ / gram fat | U+/- | 24% |
| WHO dl-PCBs TEQ incl. LOQ 2005 | 7.4 | pg TEQ / gram fat | U+/- | 24% |
| WHO PCDD/F + dl-PCBs TEQ excl. LOQ 2005 | 9 | pg TEQ / gram fat | U+/- | 23% |
| WHO PCDD/F + dl-PCBs TEQ incl. LOQ 2005 | 9.2 | pg TEQ / gram fat | U+/- | 23% |

Dioxins/furans (accredited under RvA L401)

| | | | | |
|---|------------|---------------|------|-----|
| 2,3,7,8-Tetrachlorodibenzo-p-dioxin | LOQ (<0.2) | pg / gram fat | U+/- | 44% |
| 1,2,3,7,8-Pentachlorodibenzo-p-dioxin | 0.25 | pg / gram fat | U+/- | 31% |
| 1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin | 0.34 | pg / gram fat | U+/- | 44% |
| 1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin | 0.81 | pg / gram fat | U+/- | 46% |
| 1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin | 0.30 | pg / gram fat | U+/- | 41% |
| 1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin | 2.0 | pg / gram fat | U+/- | 34% |
| Octachlorodibenzo-p-dioxin | 3.5 | pg / gram fat | U+/- | 49% |
| 2,3,7,8-Tetrachlorodibenzofuran | 2.2 | pg / gram fat | U+/- | 27% |
| 1,2,3,7,8-Pentachlorodibenzofuran | 0.97 | pg / gram fat | U+/- | 31% |
| 2,3,4,7,8-Pentachlorodibenzofuran | 1.6 | pg / gram fat | U+/- | 29% |
| 1,2,3,4,7,8-Hexachlorodibenzofuran | 1.1 | pg / gram fat | U+/- | 37% |
| 1,2,3,6,7,8-Hexachlorodibenzofuran | 1.4 | pg / gram fat | U+/- | 25% |
| 1,2,3,7,8,9-Hexachlorodibenzofuran | LOQ (<0.2) | pg / gram fat | U+/- | 41% |
| 2,3,4,6,7,8-Hexachlorodibenzofuran | 0.87 | pg / gram fat | U+/- | 32% |

| | | | | |
|---------------------------------------|------------|---------------|------|-----|
| 1,2,3,4,6,7,8-Heptachlorodibenzofuran | 3.0 | pg / gram fat | U+/- | 25% |
| 1,2,3,4,7,8,9-Heptachlorodibenzofuran | LOQ (<0.2) | pg / gram fat | U+/- | 28% |
| Octachlorodibenzofuran | 0.55 | pg / gram fat | U+/- | 37% |

dl-PCBs (accredited under RvA L401)

| | | | | |
|---|----------|---------------|------|-----|
| 3,3',4,4'-Tetrachlorobiphenyl (#77) | 40 | pg / gram fat | U+/- | 39% |
| 3,4,4',5-Tetrachlorobiphenyl (#81) | 3.9 | pg / gram fat | U+/- | 32% |
| 3,3',4,4',5-Pentachlorobiphenyl (#126) | 69 | pg / gram fat | U+/- | 26% |
| 3,3',4,4',5,5'-Hexachlorobiphenyl (#169) | 12 | pg / gram fat | U+/- | 53% |
| 2,3,3',4,4'-Pentachlorobiphenyl (#105) | 530 | pg / gram fat | U+/- | 51% |
| 2,3,4,4',5-Pentachlorobiphenyl (#114) | 20 | pg / gram fat | U+/- | 32% |
| 2,3',4,4',5-Pentachlorobiphenyl (#118) | 2600 | pg / gram fat | U+/- | 44% |
| 2,3',4,4',5'-Pentachlorobiphenyl (#123) | LOQ (<2) | pg / gram fat | U+/- | 36% |
| 2,3,3',4,4',5-Hexachlorobiphenyl (#156) | 1600 | pg / gram fat | U+/- | 36% |
| 2,3,3',4,4',5'-Hexachlorobiphenyl (#157) | 120 | pg / gram fat | U+/- | 37% |
| 2,3',4,4',5,5'-Hexachlorobiphenyl (#167) | 550 | pg / gram fat | U+/- | 35% |
| 2,3,3',4,4',5,5'-Heptachlorobiphenyl (#189) | 260 | pg / gram fat | U+/- | 37% |

Recovery Dioxins/furans

| | |
|---|-------|
| 2,3,7,8-Tetrachlorodibenzo-p-dioxin | 46% |
| 1,2,3,7,8-Pentachlorodibenzo-p-dioxin | 64.5% |
| 1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin | 64.9% |
| 1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin | 55.6% |
| 1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin | 69.8% |
| 1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin | 67.6% |
| Octachlorodibenzo-p-dioxin | 61.8% |
| 2,3,7,8-Tetrachlorodibenzofuran | 48.9% |
| 1,2,3,7,8-Pentachlorodibenzofuran | 60.3% |
| 2,3,4,7,8-Pentachlorodibenzofuran | 55.2% |
| 1,2,3,4,7,8-Hexachlorodibenzofuran | 68.9% |
| 1,2,3,6,7,8-Hexachlorodibenzofuran | 50% |
| 1,2,3,7,8,9-Hexachlorodibenzofuran | 60.4% |
| 2,3,4,6,7,8-Hexachlorodibenzofuran | 61.6% |
| 1,2,3,4,6,7,8-Heptachlorodibenzofuran | 61.2% |
| 1,2,3,4,7,8,9-Heptachlorodibenzofuran | 71.6% |
| Octachlorodibenzofuran | 49.7% |

Recovery dl-PCBs

| | |
|---|--------|
| 3,3',4,4'-Tetrachlorobiphenyl (#77) | 68.1% |
| 3,4,4',5-Tetrachlorobiphenyl (#81) | 82.9% |
| 3,3',4,4',5-Pentachlorobiphenyl (#126) | 53.6% |
| 3,3',4,4',5,5'-Hexachlorobiphenyl (#169) | 74% |
| 2,3,3',4,4'-Pentachlorobiphenyl (#105) | 58.4% |
| 2,3,4,4',5-Pentachlorobiphenyl (#114) | 58.9% |
| 2,3',4,4',5-Pentachlorobiphenyl (#118) | 65.1% |
| 2,3',4,4',5'-Pentachlorobiphenyl (#123) | 61% |
| 2,3,3',4,4',5-Hexachlorobiphenyl (#156) | 76.6% |
| 2,3,3',4,4',5'-Hexachlorobiphenyl (#157) | 76.5% |
| 2,3',4,4',5,5'-Hexachlorobiphenyl (#167) | 81.5% |
| 2,3,3',4,4',5,5'-Heptachlorobiphenyl (#189) | 102.9% |

Analysis report

Client:

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Abel Arkenbout
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8861 CP
Harlingen
Nederland

Authorized by:

Snezana Zeljkovic

Date report (dd-mm-yyyy):

03-09-2021

Responsible person BDS:

Emiel Felzel
Head of Testing Laboratory



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 (EU) 2015/704 of 30 April 2015.

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 41207
Client identification TW-CZ21-egg07
Sample received on 27-08-2021
Start of test 27-08-2021
End of test 01-09-2021
Matrix Food, egg(product)

Test results:

WHO sum parameters (accredited under RvA L401)

| | | | | |
|---|-------|-------------------|------|-----|
| WHO PCDD/F TEQ excl. LOQ 2005 | 0 | pg TEQ / gram fat | U+/- | 24% |
| WHO PCDD/F TEQ incl. LOQ 2005 | 0.63 | pg TEQ / gram fat | U+/- | 24% |
| WHO dl-PCBs TEQ excl. LOQ 2005 | 0.054 | pg TEQ / gram fat | U+/- | 24% |
| WHO dl-PCBs TEQ incl. LOQ 2005 | 0.06 | pg TEQ / gram fat | U+/- | 24% |
| WHO PCDD/F + dl-PCBs TEQ excl. LOQ 2005 | 0.054 | pg TEQ / gram fat | U+/- | 23% |
| WHO PCDD/F + dl-PCBs TEQ incl. LOQ 2005 | 0.69 | pg TEQ / gram fat | U+/- | 23% |

Dioxins/furans (accredited under RvA L401)

| | | | | |
|---|------------|---------------|------|-----|
| 2,3,7,8-Tetrachlorodibenzo-p-dioxin | LOQ (<0.2) | pg / gram fat | U+/- | 44% |
| 1,2,3,7,8-Pentachlorodibenzo-p-dioxin | LOQ (<0.2) | pg / gram fat | U+/- | 31% |
| 1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin | LOQ (<0.2) | pg / gram fat | U+/- | 44% |
| 1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin | LOQ (<0.2) | pg / gram fat | U+/- | 46% |
| 1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin | LOQ (<0.2) | pg / gram fat | U+/- | 41% |
| 1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin | LOQ (<0.2) | pg / gram fat | U+/- | 34% |
| Octachlorodibenzo-p-dioxin | LOQ (<2) | pg / gram fat | U+/- | 49% |
| 2,3,7,8-Tetrachlorodibenzofuran | LOQ (<0.2) | pg / gram fat | U+/- | 27% |
| 1,2,3,7,8-Pentachlorodibenzofuran | LOQ (<0.2) | pg / gram fat | U+/- | 31% |
| 2,3,4,7,8-Pentachlorodibenzofuran | LOQ (<0.2) | pg / gram fat | U+/- | 29% |
| 1,2,3,4,7,8-Hexachlorodibenzofuran | LOQ (<0.2) | pg / gram fat | U+/- | 37% |
| 1,2,3,6,7,8-Hexachlorodibenzofuran | LOQ (<0.2) | pg / gram fat | U+/- | 25% |
| 1,2,3,7,8,9-Hexachlorodibenzofuran | LOQ (<0.2) | pg / gram fat | U+/- | 41% |
| 2,3,4,6,7,8-Hexachlorodibenzofuran | LOQ (<0.2) | pg / gram fat | U+/- | 32% |
| 1,2,3,4,6,7,8-Heptachlorodibenzofuran | LOQ (<0.2) | pg / gram fat | U+/- | 25% |
| 1,2,3,4,7,8,9-Heptachlorodibenzofuran | LOQ (<0.2) | pg / gram fat | U+/- | 28% |
| Octachlorodibenzofuran | LOQ (<0.2) | pg / gram fat | U+/- | 37% |

dl-PCBs (accredited under RvA L401)

| | | | | |
|---|------------|---------------|------|-----|
| 3,3',4,4'-Tetrachlorobiphenyl (#77) | 5.8 | pg / gram fat | U+/- | 39% |
| 3,4,4',5-Tetrachlorobiphenyl (#81) | LOQ (<2) | pg / gram fat | U+/- | 32% |
| 3,3',4,4',5-Pentachlorobiphenyl (#126) | 0.51 | pg / gram fat | U+/- | 26% |
| 3,3',4,4',5,5'-Hexachlorobiphenyl (#169) | LOQ (<0.2) | pg / gram fat | U+/- | 53% |
| 2,3,3',4,4'-Pentachlorobiphenyl (#105) | 11 | pg / gram fat | U+/- | 51% |
| 2,3,4,4',5-Pentachlorobiphenyl (#114) | LOQ (<2) | pg / gram fat | U+/- | 32% |
| 2,3',4,4',5-Pentachlorobiphenyl (#118) | 31 | pg / gram fat | U+/- | 44% |
| 2,3',4,4',5'-Pentachlorobiphenyl (#123) | LOQ (<2) | pg / gram fat | U+/- | 36% |
| 2,3,3',4,4',5-Hexachlorobiphenyl (#156) | 5.7 | pg / gram fat | U+/- | 36% |
| 2,3,3',4,4',5'-Hexachlorobiphenyl (#157) | LOQ (<2) | pg / gram fat | U+/- | 37% |
| 2,3',4,4',5,5'-Hexachlorobiphenyl (#167) | 3.4 | pg / gram fat | U+/- | 35% |
| 2,3,3',4,4',5,5'-Heptachlorobiphenyl (#189) | LOQ (<2) | pg / gram fat | U+/- | 37% |



Analysis report

Client:

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Abel Arkenbout
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Nederland

Authorized by:

Snezana Zeljkovic

Date report (dd-mm-yyyy):

03-09-2021

Responsible person BDS:

Emiel Felzel
Head of Testing Laboratory

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 (EU) 2015/704 of 30 April 2015.

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 41208
Client identification TW-CZ21-egg08
Sample received on 27-08-2021
Start of test 27-08-2021
End of test 01-09-2021
Matrix Food, egg(product)

Judgement

Non-compliant for maximal level limit (expressed as WHO PCDD/F + dl-PCBs TEQ) taking into account expanded measurement uncertainty. Sample TW-CZ21-egg08 is above the maximal level of 5 pg TEQ / gram fat.

Test results:

WHO sum parameters (accredited under RvA L401)

| | | | | |
|---|-----|-------------------|------|-----|
| WHO PCDD/F TEQ excl. LOQ 2005 | 1 | pg TEQ / gram fat | U+/- | 24% |
| WHO PCDD/F TEQ incl. LOQ 2005 | 1.3 | pg TEQ / gram fat | U+/- | 24% |
| WHO dl-PCBs TEQ excl. LOQ 2005 | 8.4 | pg TEQ / gram fat | U+/- | 24% |
| WHO dl-PCBs TEQ incl. LOQ 2005 | 8.4 | pg TEQ / gram fat | U+/- | 24% |
| WHO PCDD/F + dl-PCBs TEQ excl. LOQ 2005 | 9.4 | pg TEQ / gram fat | U+/- | 23% |
| WHO PCDD/F + dl-PCBs TEQ incl. LOQ 2005 | 9.7 | pg TEQ / gram fat | U+/- | 23% |

Dioxins/furans (accredited under RvA L401)

| | | | | |
|---|------------|---------------|------|-----|
| 2,3,7,8-Tetrachlorodibenzo-p-dioxin | LOQ (<0.2) | pg / gram fat | U+/- | 44% |
| 1,2,3,7,8-Pentachlorodibenzo-p-dioxin | 0.29 | pg / gram fat | U+/- | 31% |
| 1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin | LOQ (<0.2) | pg / gram fat | U+/- | 44% |
| 1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin | 0.44 | pg / gram fat | U+/- | 46% |
| 1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin | LOQ (<0.2) | pg / gram fat | U+/- | 41% |
| 1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin | 0.54 | pg / gram fat | U+/- | 34% |
| Octachlorodibenzo-p-dioxin | LOQ (<2) | pg / gram fat | U+/- | 49% |
| 2,3,7,8-Tetrachlorodibenzofuran | 2.0 | pg / gram fat | U+/- | 27% |
| 1,2,3,7,8-Pentachlorodibenzofuran | 0.45 | pg / gram fat | U+/- | 31% |
| 2,3,4,7,8-Pentachlorodibenzofuran | 1.1 | pg / gram fat | U+/- | 29% |
| 1,2,3,4,7,8-Hexachlorodibenzofuran | 0.62 | pg / gram fat | U+/- | 37% |
| 1,2,3,6,7,8-Hexachlorodibenzofuran | 0.38 | pg / gram fat | U+/- | 25% |
| 1,2,3,7,8,9-Hexachlorodibenzofuran | LOQ (<0.2) | pg / gram fat | U+/- | 41% |
| 2,3,4,6,7,8-Hexachlorodibenzofuran | 0.30 | pg / gram fat | U+/- | 32% |

| | | | | |
|---------------------------------------|------------|---------------|------|-----|
| 1,2,3,4,6,7,8-Heptachlorodibenzofuran | 2.0 | pg / gram fat | U+/- | 25% |
| 1,2,3,4,7,8,9-Heptachlorodibenzofuran | LOQ (<0.2) | pg / gram fat | U+/- | 28% |
| Octachlorodibenzofuran | 0.21 | pg / gram fat | U+/- | 37% |

dl-PCBs (accredited under RvA L401)

| | | | | |
|---|----------|---------------|------|-----|
| 3,3',4,4'-Tetrachlorobiphenyl (#77) | 50 | pg / gram fat | U+/- | 39% |
| 3,4,4',5-Tetrachlorobiphenyl (#81) | 3.5 | pg / gram fat | U+/- | 32% |
| 3,3',4,4',5-Pentachlorobiphenyl (#126) | 79 | pg / gram fat | U+/- | 26% |
| 3,3',4,4',5,5'-Hexachlorobiphenyl (#169) | 11 | pg / gram fat | U+/- | 53% |
| 2,3,3',4,4'-Pentachlorobiphenyl (#105) | 320 | pg / gram fat | U+/- | 51% |
| 2,3,4,4',5-Pentachlorobiphenyl (#114) | 13 | pg / gram fat | U+/- | 32% |
| 2,3',4,4',5-Pentachlorobiphenyl (#118) | 1800 | pg / gram fat | U+/- | 44% |
| 2,3',4,4',5'-Pentachlorobiphenyl (#123) | LOQ (<2) | pg / gram fat | U+/- | 36% |
| 2,3,3',4,4',5-Hexachlorobiphenyl (#156) | 1900 | 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) | 850 | pg / gram fat | U+/- | 35% |
| 2,3,3',4,4',5,5'-Heptachlorobiphenyl (#189) | 340 | pg / gram fat | U+/- | 37% |

Recovery Dioxins/furans

| | |
|---|--------|
| 2,3,7,8-Tetrachlorodibenzo-p-dioxin | 55% |
| 1,2,3,7,8-Pentachlorodibenzo-p-dioxin | 57.4% |
| 1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin | 65.4% |
| 1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin | 66.7% |
| 1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin | 56.5% |
| 1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin | 100.9% |
| Octachlorodibenzo-p-dioxin | 64.8% |
| 2,3,7,8-Tetrachlorodibenzofuran | 52.9% |
| 1,2,3,7,8-Pentachlorodibenzofuran | 67.5% |
| 2,3,4,7,8-Pentachlorodibenzofuran | 61.6% |
| 1,2,3,4,7,8-Hexachlorodibenzofuran | 61.4% |
| 1,2,3,6,7,8-Hexachlorodibenzofuran | 68.8% |
| 1,2,3,7,8,9-Hexachlorodibenzofuran | 69.7% |
| 2,3,4,6,7,8-Hexachlorodibenzofuran | 70.3% |
| 1,2,3,4,6,7,8-Heptachlorodibenzofuran | 77.6% |
| 1,2,3,4,7,8,9-Heptachlorodibenzofuran | 71% |
| Octachlorodibenzofuran | 61.6% |

Recovery dl-PCBs

| | |
|---|-------|
| 3,3',4,4'-Tetrachlorobiphenyl (#77) | 57.9% |
| 3,4,4',5-Tetrachlorobiphenyl (#81) | 66% |
| 3,3',4,4',5-Pentachlorobiphenyl (#126) | 60.6% |
| 3,3',4,4',5,5'-Hexachlorobiphenyl (#169) | 127% |
| 2,3,3',4,4'-Pentachlorobiphenyl (#105) | 71.4% |
| 2,3,4,4',5-Pentachlorobiphenyl (#114) | 68.5% |
| 2,3',4,4',5-Pentachlorobiphenyl (#118) | 64.3% |
| 2,3',4,4',5'-Pentachlorobiphenyl (#123) | 89.5% |
| 2,3,3',4,4',5-Hexachlorobiphenyl (#156) | 77.6% |
| 2,3,3',4,4',5'-Hexachlorobiphenyl (#157) | 94.5% |
| 2,3',4,4',5,5'-Hexachlorobiphenyl (#167) | 80.7% |
| 2,3,3',4,4',5,5'-Heptachlorobiphenyl (#189) | 95.6% |

Analysis report

Client:

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Nederland

Authorized by:

Snezana Zeljkovic

Date report (dd-mm-yyyy):

03-09-2021

Responsible person BDS:

Emiel Felzel
Head of Testing Laboratory



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 | 41209 |
| Client identification | TW-CZ21-egg09 |
| Sample received on | 27-08-2021 |
| Start of test | 27-08-2021 |
| End of test | 01-09-2021 |
| Matrix | Food, egg(product) |

Test results:

WHO sum parameters (accredited under RvA L401)

| | | | | |
|---|------|-------------------|------|-----|
| WHO PCDD/F TEQ excl. LOQ 2005 | 0.26 | pg TEQ / gram fat | U+/- | 24% |
| WHO PCDD/F TEQ incl. LOQ 2005 | 0.74 | pg TEQ / gram fat | U+/- | 24% |
| WHO dl-PCBs TEQ excl. LOQ 2005 | 2.8 | pg TEQ / gram fat | U+/- | 24% |
| WHO dl-PCBs TEQ incl. LOQ 2005 | 2.8 | pg TEQ / gram fat | U+/- | 24% |
| WHO PCDD/F + dl-PCBs TEQ excl. LOQ 2005 | 3 | pg TEQ / gram fat | U+/- | 23% |
| WHO PCDD/F + dl-PCBs TEQ incl. LOQ 2005 | 3.5 | pg TEQ / gram fat | U+/- | 23% |

Dioxins/furans (accredited under RvA L401)

| | | | | |
|---|------------|---------------|------|-----|
| 2,3,7,8-Tetrachlorodibenzo-p-dioxin | LOQ (<0.2) | pg / gram fat | U+/- | 44% |
| 1,2,3,7,8-Pentachlorodibenzo-p-dioxin | LOQ (<0.2) | pg / gram fat | U+/- | 31% |
| 1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin | LOQ (<0.2) | pg / gram fat | U+/- | 44% |
| 1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin | LOQ (<0.2) | 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 | 0.66 | pg / gram fat | U+/- | 34% |
| Octachlorodibenzo-p-dioxin | LOQ (<2) | pg / gram fat | U+/- | 49% |
| 2,3,7,8-Tetrachlorodibenzofuran | 0.82 | pg / gram fat | U+/- | 27% |
| 1,2,3,7,8-Pentachlorodibenzofuran | 0.23 | pg / gram fat | U+/- | 31% |
| 2,3,4,7,8-Pentachlorodibenzofuran | 0.23 | pg / gram fat | U+/- | 29% |
| 1,2,3,4,7,8-Hexachlorodibenzofuran | 0.24 | pg / gram fat | U+/- | 37% |
| 1,2,3,6,7,8-Hexachlorodibenzofuran | 0.30 | pg / gram fat | U+/- | 25% |
| 1,2,3,7,8,9-Hexachlorodibenzofuran | LOQ (<0.2) | pg / gram fat | U+/- | 41% |
| 2,3,4,6,7,8-Hexachlorodibenzofuran | LOQ (<0.2) | pg / gram fat | U+/- | 32% |
| 1,2,3,4,6,7,8-Heptachlorodibenzofuran | 1.9 | pg / gram fat | U+/- | 25% |
| 1,2,3,4,7,8,9-Heptachlorodibenzofuran | LOQ (<0.2) | pg / gram fat | U+/- | 28% |
| Octachlorodibenzofuran | LOQ (<0.2) | pg / gram fat | U+/- | 37% |

dl-PCBs (accredited under RvA L401)

| | | | | |
|---|----------|---------------|------|-----|
| 3,3',4,4'-Tetrachlorobiphenyl (#77) | 87 | pg / gram fat | U+/- | 39% |
| 3,4,4',5-Tetrachlorobiphenyl (#81) | 12 | pg / gram fat | U+/- | 32% |
| 3,3',4,4',5-Pentachlorobiphenyl (#126) | 26 | pg / gram fat | U+/- | 26% |
| 3,3',4,4',5,5'-Hexachlorobiphenyl (#169) | 3.3 | pg / gram fat | U+/- | 53% |
| 2,3,3',4,4'-Pentachlorobiphenyl (#105) | 430 | pg / gram fat | U+/- | 51% |
| 2,3,4,4',5-Pentachlorobiphenyl (#114) | 23 | pg / gram fat | U+/- | 32% |
| 2,3',4,4',5-Pentachlorobiphenyl (#118) | 1100 | pg / gram fat | U+/- | 44% |
| 2,3',4,4',5'-Pentachlorobiphenyl (#123) | LOQ (<2) | pg / gram fat | U+/- | 36% |
| 2,3,3',4,4',5-Hexachlorobiphenyl (#156) | 470 | pg / gram fat | U+/- | 36% |
| 2,3,3',4,4',5'-Hexachlorobiphenyl (#157) | 45 | pg / gram fat | U+/- | 37% |
| 2,3',4,4',5,5'-Hexachlorobiphenyl (#167) | 320 | pg / gram fat | U+/- | 35% |
| 2,3,3',4,4',5,5'-Heptachlorobiphenyl (#189) | 79 | pg / gram fat | U+/- | 37% |

Analysis report

Client:

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 8861 CP
 Harlingen
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Authorized by:

Emiel Felzel
 Head of Testing Laboratory

Date report (dd-mm-yyyy):

02-11-2021

Responsible person BDS:

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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.

Accreditation ISO 17025 (RvA L401) is not applicable for activities described in this report

Date of the performance of the test: 02-11-2021

Table 1 sample analysis results

| No. | Client code | Method | Parameter | Result | Unit |
|-----|-------------------------------|------------|----------------------------------|--------|-------------------------|
| 1 | TW21LT-MOS-01 | FITC-T4 | Thyroid disruption | 8.4 | ug PFOA eq./g |
| 2 | TW21LT-MOS-01 | PAH CALUX | Polycyclic aromatic hydrocarbons | 230 | ng Benzo[a]pyrene eq./g |
| 3 | TW21LT-MOS-03 | FITC-T4 | Thyroid disruption | 13 | ug PFOA eq./g |
| 4 | TW21LT-MOS-03 | PAH CALUX | Polycyclic aromatic hydrocarbons | 220 | ng Benzo[a]pyrene eq./g |
| 5 | TW-MD21-VEG-01 / -02 | FITC-T4 | Thyroid disruption | 26 | ug PFOA eq./g |
| 6 | TW-MD21-VEG-01 / -02 | PAH CALUX | Polycyclic aromatic hydrocarbons | 220 | ng Benzo[a]pyrene eq./g |
| 7 | TW-MD21-VEG-20 / 22 / 23 | FITC-T4 | Thyroid disruption | 22 | ug PFOA eq./g |
| 8 | TW-MD21-VEG-20 / 22 / 23 | PAH CALUX | Polycyclic aromatic hydrocarbons | 8.1 | ng Benzo[a]pyrene eq./g |
| 9 | TW-MD21-VEG-13 / 14 / 15 / 16 | FITC-T4 | Thyroid disruption | 17 | ug PFOA eq./g |
| 10 | TW-MD21-VEG-13 / 14 / 15 / 16 | PAH CALUX | Polycyclic aromatic hydrocarbons | 380 | ng Benzo[a]pyrene eq./g |
| 11 | TW-MD21-VEG-23 | FITC-T4 | Thyroid disruption | 17 | ug PFOA eq./g |
| 12 | TW-MD21-VEG-23 | PAH CALUX | Polycyclic aromatic hydrocarbons | 31 | ng Benzo[a]pyrene eq./g |
| 13 | TW-CZ21-EGG-02 | FITC-T4 | Thyroid disruption | 1.2 | ug PFOA eq./g |
| 14 | TW-CZ21-EGG-02 | PFAS CALUX | Thyroid disruption | 0.25 | ug PFOA eq./g |
| 15 | TW-CZ21-EGG-04 | FITC-T4 | Thyroid disruption | 1.4 | ug PFOA eq./g |
| 16 | TW-CZ21-EGG-04 | PFAS CALUX | Thyroid disruption | 0.13 | ug PFOA eq./g |
| 17 | TW-CZ21-PS-VEG-01 | PAH CALUX | Polycyclic aromatic hydrocarbons | 61 | ng Benzo[a]pyrene eq./g |
| 18 | TW-CZ21-PS-VEG-05 | PAH CALUX | Polycyclic aromatic hydrocarbons | 0.70 | ng Benzo[a]pyrene eq./g |
| 19 | TW-CZ21-MOS-01 | FITC-T4 | Thyroid disruption | 1.6 | ug PFOA eq./g |
| 20 | TW-CZ21-MOS-03 / 3.1 / 3.2 | FITC-T4 | Thyroid disruption | 1.7 | ug PFOA eq./g |

Table 2 sample characteristics

| No. | Client code | BDS code | Matrix | ISO17025 (RvA L401) | Date arrival | Sealed |
|-----|-------------------------------|----------|--------------------|---------------------|--------------|--------|
| 1 | TW21LT-MOS-01 | 41319 | Not defined | no | 21-09-2021 | |
| 2 | TW21LT-MOS-01 | 41319 | Not defined | no | 21-09-2021 | |
| 3 | TW21LT-MOS-03 | 41320 | Not defined | no | 21-09-2021 | |
| 4 | TW21LT-MOS-03 | 41320 | Not defined | no | 21-09-2021 | |
| 5 | TW-MD21-VEG-01 / -02 | 41323 | Not defined | no | 21-09-2021 | |
| 6 | TW-MD21-VEG-01 / -02 | 41323 | Not defined | no | 21-09-2021 | |
| 7 | TW-MD21-VEG-20 / 22 / 23 | 41324 | Not defined | no | 21-09-2021 | |
| 8 | TW-MD21-VEG-20 / 22 / 23 | 41324 | Not defined | no | 21-09-2021 | |
| 9 | TW-MD21-VEG-13 / 14 / 15 / 16 | 41325 | Not defined | no | 21-09-2021 | |
| 10 | TW-MD21-VEG-13 / 14 / 15 / 16 | 41325 | Not defined | no | 21-09-2021 | |
| 11 | TW-MD21-VEG-23 | 41326 | Not defined | no | 21-09-2021 | |
| 12 | TW-MD21-VEG-23 | 41326 | Not defined | no | 21-09-2021 | |
| 13 | TW-CZ21-EGG-02 | 41327 | Food, egg(product) | no | 21-09-2021 | |

| | | | | | |
|----|----------------------------|-------|--------------------|----|------------|
| 14 | TW-CZ21-EGG-02 | 41327 | Food, egg(product) | no | 21-09-2021 |
| 15 | TW-CZ21-EGG-04 | 41328 | Food, egg(product) | no | 21-09-2021 |
| 16 | TW-CZ21-EGG-04 | 41328 | Food, egg(product) | no | 21-09-2021 |
| 17 | TW-CZ21-PS-VEG-01 | 41329 | Not defined | no | 21-09-2021 |
| 18 | TW-CZ21-PS-VEG-05 | 41330 | Not defined | no | 21-09-2021 |
| 19 | TW-CZ21-MOS-01 | 41331 | Not defined | no | 21-09-2021 |
| 20 | TW-CZ21-MOS-03 / 3.1 / 3.2 | 41332 | Not defined | no | 21-09-2021 |

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 PFAS CALUX and the sum parameter Thyroid disruption the used method is

For the method FITC-T4 and the parameter Thyroid disruption the used method is