Pesticide Action Network Europe

PAN Europe Study of Pesticide and Biocide Contamination of Fruit and Vegetables in Four EU Member States

Autumn 2009: Preliminary Data

Residues in Lettuce

	Pesticide	Result mg/kg	MRL mg/kg	Effects – concerns - legislations
Dutch lettuce				
182712.1	deltamethrin (Q)	0.08 mg/kg	0.5	ED Category 1 [COM(1999)706] should be phased out soon according to new EU regulation
	iprodione (Q)	0.03 mg/kg	10	Carcinogenic Cat c, C3
	tolclofos-methyl	0.02 mg/kg	2	
	pirimicarb	0.12 mg/kg		
	pirimicarb,desmethyl	0.38 mg/kg		
	pirimicarb(sum)	0.50 mg/kg	5	
	propamocarb (Q)	3.2 mg/kg	50	
182709	deltamethrin (Q)	0.03 mg/kg	0.5	ED Category 1
	iprodione (Q)	0.87 mg/kg	10	Carcinogenic Cat c, C3
	metalaxyl	0.02	2	
	tolclofos-methyl	0.23 mg/kg	2	
	propamocarb (Q)	6.5 mg/kg	50	
182713	dimethomorph	0.03	10	
	tolclofos-methyl	0.02 mg/kg	2	
	propamocarb (Q)	0.16 mg/kg	50	
182710	propamocarb (Q)	0.02 mg/kg	50	
182708.1	propamocarb (Q)	0.02 mg/kg	50	
182711	tolclofos-methyl	0.01 mg/kg	2	
182701.1	metalaxyl	0.02	2	

	thiamethoxam	0.03	5	
182702.1	iprodione (Q)	0.03 mg/kg	10	Carcinogenic Cat c, C3
182704.1	iprodione (Q)	2.5 mg/kg	10	Carcinogenic Cat c, C3
	tolclofos-methyl	0.04 mg/kg	2	
	pirimicarb	0.03 mg/kg		
	pirimicarb,desmethyl	0.12 mg/kg		
	pirimicarb(sum)	0.15 mg/kg	5	
	propamocarb (Q)	3.3 mg/kg	50	
	pymetrozine	0.1	2	Carcinogenic Cat c, C3
182705.1	iprodione (Q)	0.08 mg/kg	10	Carcinogenic Cat c, C3
	propamocarb (Q)	0.13 mg/kg	50	
182706.1	iprodione (Q)	0.59 mg/kg	10	Carcinogenic Cat c, C3
	tolclofos-methyl	0.18 mg/kg	2	
	propamocarb (Q)	5.5 mg/kg	50	
	thiamethoxam	0.02	5	
182707.1	tolclofos-methyl	0.01 mg/kg	2	
	propamocarb (Q)	0.06 mg/kg	50	
182717.1	cyprodinil	0.67	10	
	fludioxonil	0.98	10	
	iprodione (Q)	0.21 mg/kg	10	Carcinogenic Cat c, C3
	metalaxyl	0.04	2	
	tolclofos-methyl	0.02 mg/kg	2	
	propamocarb (Q)	0.13 mg/kg	50	
182718.1	-			clean
182722.1	iprodione (Q)	0.08 mg/kg	10	Carcinogenic Cat c, C3
	sulphur	2	50	
182716	fenhexamid	0.02	30	
182719.1	iprodione (Q)	0.03 mg/kg	10	Carcinogenic Cat c, C3
	metalaxyl	0.02	2	
	tolclofos-methyl	0.02 mg/kg	2	
	propamocarb (Q)	6.7 mg/kg	50	
182720.1	-			Clean
182721.1	iprodione (Q)	0.08 mg/kg	10	Carcinogenic Cat c, C3
	metalaxyl	0.14	2	
	tolclofos-methyl	0.04 mg/kg	2	
	propamocarb (Q)	0.17 mg/kg	50	
182723.1	sulphur	1	50	

182724.1	deltamethrin (Q)	0.03 mg/kg	0.5	ED Category 1 [COM(1999)706] should be phased out soon according to new EU regulation
	dimethomorph	0.04	10	
	iprodione (Q)	1.4 mg/kg	10	Carcinogenic Cat c, C3
	tolclofos-methyl	0.02 mg/kg	2	
	pirimicarb,desmethyl	0.02 mg/kg		
	pirimicarb(sum)	0.02 mg/kg	5	
	propamocarb (Q)	0.92 mg/kg	50	
Slovakian lettuce				
SK-CEPTA-002	-			Clean
SK-CEPTA-004	-			Clean
SK-CEPTA-006	-			Clean
SK-CEPTA- 008	-			clean
SK-CEPTA-010 - Slovakian	bifenthrin	0.14	2	ED Category 1 [COM(1999)706] Annex 1 of Pending (331) as of 5 February 2008 (from Annex1)
	boscalid	0.77	10	
	dimethomorph	0.08	10	
	iprodione	0.07	10	Carcinogenic Cat c, C3
	propamocarb	0.10	50	
	pyraclostrobin	0.08	2	
	spinosad	0.02	10	
6 SK-CEPTA-012	-			Clean
Hungarian lettuce				
091121 PSzoS 201	Azoxystrobin	<0.02	3	
091121SSzoS203	Azoxystrobin	2.10	3	
091123SNyS 205	Azoxystrobin	2.50	3	
091123PNyS 207	Azoxystrobin	0.05	3	
091123AMS 209				clean
091123PMS 212				clean
091123PSzeS 214	Azoxystrobin	<0.02	3	
091123SKiS 216	Azoxystrobin	0.02	3	
091123AKeS 218	Indoxacarb	0.18	2	
	Nicobifen (Boscalid)	0.42	10	
091125 ASzS 220	Acetamiprid	0.12	5	
	Azoxystrobin	1.23	3	
	Thiamethoxam	0.25	5	
091125 PSzS 222			\	Clean
091125 SSzS 224	Azoxystrobin	0.40	3	
	Propamocarb	0.98	50	
091125 PSiS 226	Azoxystrobin	0.04	3	
	Nicobifen (Boscalid)	0.06	10	
	Propamocarb	1.18	50	

091125 SSiS 228	Azoxystrobin	1.74	3	
	Propamocarb	<0.02	50	
091125 SBS 230	Azoxystrobin	0.07	3	
Bulgarian lettuce				
11-6 Billa	sulphur	1	50	
	prochloraz	0.03	5	
11-10 Metro	metalaxyl	0.02	2	
	vinclozolin	0.20	5	Banned in EU
	fenamidone	0.8	2	
	carbendazim	0.27	0.1	M2,R2
	thiophanate-methy	6.1	0.1	M3
11-7 Metro	imidacloprid	0.12	2	
11-5 Billa	procymidone	0.02	5	Banned in EU R2 ED Category 1 [COM(1999)706]
11-8 -Metro	indoxacarb	0.06	2	
11-9- metro	-			clean

Lettuce summary

	Number of resiude detected/ % of samples with residues	Clean	Samples with residues with health concerns	Residue/sample - maximum number
Dutch	61 / 90.5%	2 / 9.5 %	0.44	2.9 / 7
Bulgarian	10 / 83%	1 / 17%	0.33	1.7 / 4
Slovakian	7 / 17%	5 / 83%	0.12	1.2 / 7
Hungarian				

Above MRL: 1 Bulgrian sample, 2 subtance: thiophanate-methy mutagenic category 2, 61 times above MRL, carbendazim reprotxic and carcinogenic categorty 1b 2.7 times above MRL

Holland	2.8125	maximum	7
Bulgaria	1.666666667	maximum	4
Slovakia	1.166666667	maximum	7

Residues in Mandarins

	Pesticide	Result mg/kg	MRL mg/kg	Effects – concerns - legislations
Dutch Mandarin				
182701	chlorpyrifos	0.11	2	Theodore Slotkin reprotox Phased out as biocide
	phenylphenol,2- (Q)	0.21	12	
	imazalil	1.6	5	
	thiabendazole	0.01	5	
182702	chlorpyrifos	0.09	2	Phases out as biocide
	imazalil	1.3	5	
182703	chlorpyrifos	0.02	2	Phases out as biocide
	cyhalothrin,lambda-	0.01	0.2	ED Category 1 [COM(1999)706] – should be phased out according to new EU regulation
182704	chlorpyrifos	0.07	2	
	cyhalothrin,lambda-	0.04	0.2	ED Category 1
	imazalil	1.1	5	
182705	chlorpyrifos	0.05	2	Phases out as biocide
	phenylphenol,2- (Q)	1.4	12	
	imazalil	1.1	5	
182706	chlorpyrifos	0.15	2	Phases out as biocide
	cyhalothrin,lambda-	0.02	0.2	ED Category 1
	pyrimethanil	0.08	10	
	pyriproxyfen	0.02	0.6	
	imazalil	2.1	5	
	thiabendazole	0.02	5	
182707	chlorpyrifos	0.06	2	Phases out as biocide
	phenylphenol,2-	2.2	12	
	imazalil	1.9	5	
182710.1	chlorpyrifos	0.17	2	Phases out as biocide
	phenylphenol,2-	2.3	12	
182713.1	chlorpyrifos	0.03	2	Phases out as biocide
182711.1	cyhalothrin,lambda-	0.02	0.2	ED Category 1
	phenylphenol,2-	2.6	12	
	imazalil	1.9	5	
182712	phenylphenol,2-	0.07	12	
	imazalil	1.4	5	
	thiabendazole	0.06	5	
182708	chlorpyrifos	0.10	2	Phases out as biocide
	chlorpyrifos-methyl	0.06	1	Phases out as biocide
	cyhalothrin,lambda-	0.02	0.2	ED Category 1
	imazalil	0.66	5	
182709.1	chlorpyrifos	0.10	2	Phases out as biocide
	etofenprox	0.02	1	

	imazalil	1.4	5	
182722	chlorpyrifos	0.02	2	Phases out as biocide
	imazalil	0.67	5	
182717	chlorpyrifos	0.04	2	Phases out as biocide
	sulphur	2	50	
	hexythiazox	0.01	1	
	imazalil	0.87	5	
182716.1	chlorpyrifos	0.06	2	Phases out as biocide
	tebufenpyrad	0.01	0.5	
	imazalil	1.2	5	
182718	chlorpyrifos	0.06	2	Phases out as biocide
	imazalil	0.67	5	
182719	chlorpyrifos	0.01	2	Phases out as biocide
	chlorpyrifos-methyl	0.11	1	Phases out as biocide
	imazalil	2.0	5	
182720	chlorpyrifos	0.14	2	Phases out as biocide
	hexythiazox	0.01	1	
	imazalil	1.3	5	
182721	chlorpyrifos	0.09	2	Phases out as biocide
	phenylphenol,2-	0.16	12	
	dicofol	0.15	2	
	imazalil	1.0	5	
182723	chlorpyrifos	0.03	2	Phases out as biocide
	imazalil	1.8	5	
182724	chlorpyrifos	0.08	2	Phases out as biocide
	malathion	0.13	7	banned in EU http://ec.europa.eu/food/plant/protection/evaluation/existactive/list1_malathion_en.pdf US EPA Suggestive Carcinogen
	imazalil	0.72	5	
Slovakian mandarin				
SK-CEPTA-001	chlorpyrifos	0.05	2	Phases out as biocide
	imazalil	0.58	5	
	thiabendazole	0.36	5	
SK-CEPTA-003	chlorpyrifos	0.08	2	Phases out as biocide
	imazalil	0.33	5	
SK-CEPTA-005	chlorpyrifos	0.04	2	Phases out as biocide
	tebufenpyrad	0.07	0.5	
	imazalil	0.03	5	
SK-CEPTA-007	chlorpyrifos	0.09	2	Phases out as biocide
	tebufenpyrad	0.01	0.5	
	imazalil	0.51	5	
SK-CEPTA-009	chlorpyrifos	0.03	2	Phases out as biocide
	tebufenpyrad	0.01	0.5	
	imazalil	0.26	5	
Hungarian Mandarin				

0911210PSzoM202	imazalil	0.35	5	
091121SSzoM204	imazalil	0.84	5	
	Thiabendazole	0.76	5	
091123SNyM206	imazalil	0.16	5	
091123PNyM208	imazalil	1.18	5	
	Thiabendazole	0.84	5	
091123AMM 210	imazalil	0.98	5	
091123SMM 211	imazalil	0.86	5	
	Thiabendazole	0.86	5	
091123PMM 213	imazalil	2.20	5	
	Thiabendazole	2.15	5	
091123PSzeM215	Prochloraz	1.20	10	
091123SKiM 217	imazalil	0.20	5	
091123AKeM219	imazalil	0.84	5	
	Pyriproxyfen	<0.02	0.6	
	Thiabendazole	1.06	5	
091125 ASzM221			\	Clean
091125 PSzM223	imazalil	2.28	5	
	Thiabendazole	1.46	5	
091125 SSzM225			\	Clean
091125 PSiM227	imazalil	1.22	5	
091125 SSiM229	imazalil	0.13	5	
	Pyriproxyfen	<0.02	0.6	
Bulgarian Mandarins				
11-16 Bila	phenylphenol,2-	0.09	12	
	dicofol	0.07	2	
	imazalil	0.17	5	
	thiabendazole	0.04	5	
11-3 Billa	imazalil	0.35	5	
11-11 Metro	bromopropylate	0.28	2	
	phenylphenol,2-	0.09	12	
	pyriproxyfen	0.02	0.6	
	imazalil	2.3	5	
	prochloraz	0.75	10	
11-4 metro	chlorpyrifos	0.08	2	Phases out as biocide
	Imazalil	1.7	5	

Mandarin summary

	Number of resiude detected/ % of samples with residues	Clean	Samples with residues with health concerns	Residue/sample - maximum number
Dutch	81 / 100%	0	0.96	3.7 / 6
Bulgarian	12 / 100%	0	0.25	3.0 / 3
Slovakian	14 / 100%	0	1	2.3 / 5
Hungarian				

No above MRL so far

Malathion in Dutch Manadrin - not on Annex 1 - http://ec.europa.eu/food/plant/protection/evaluation/existactive/list1_malathion_en.pdf

Additional results from the Netherlands

LETTUCE (In NL nationally sourced)				
PESTICIDE	CMR and EDC (BKH-cat: cat 1 is similar to CMR-2)	NETHERLANDS (20)	SLOVAKYA (6)	BULGARIA (4)
Fenhexamid authorised in NL but NOT for lettuce		1		
Cyprodinil		1		
Fludioxonil		1		
Iprodion	C3, EDC-2	8	1	
Metalaxyl NOT INCLUDED, BUT METALAXYL-M IS INCLUDED!		5		1
Propamocarb		12	1	
Thiamethoxam		2		
Tolclofos-methyl		7		
Pirimicarb		3		
Pirimicarb-desmethyl		3		
Pymetrozine	C3	1		
Deltamethrin		3		
Dimethomorph		4	1	
Bifenthrin NON-INCLUSION 30-11-09, PHASE-OUT	PBT		1	
Boscalid			1	
Pyraclostrobin			1	
Spinosad			1	
Sulphur		1		2
Procymidon NOT INCLUDED, no resubmission!	R2, C3			1
Imidacloprid				1
Vinclozolin NOT INCLUDED, no resubmission!	EDC-1			1
Fenamidon				1
Carbendazim	M2, R2.EDC-2			1 Exceedance!
Thiophanate-methyl	M3			1 Exceedance!
Prochloraz NOT INCLUDED!	EDC-2			1

NB. THE NON-INCLUSION IS OF COURSE ONLY RELEVANT FOR EU-COUNTRIES, ADDITIONALLY ALL PESTICIDES NEED A NATIONAL AUTHORISATION, THIS YOU HAVE TO CHECK IN THE COUNTRY OF PRODUCTION!!!!!!!

MANDARIN (mainly Spain, some Argentine)				
PESTICIDE	CMR and EDC	NETHERLANDS (20)	SLOVAKYA (6)	BULGARIA (2)
Tebufenpyrad		1	3	
Chlorpyrifos-methyl	Developmental neurotoxicant	2	1	
Chlorpyrifos	Developmental neurotoxicant	19	6	
Hexythiazox NOT INCLUDED BUT RESUBMITTED, GRACE TILL 2011		2		
Phenylphenol		6		1

(pesticide??)				
L-cyhalothrin		5		
Imazalil		17	5	2
Thiabendazol		2	1	
Etofenprox		1		
Pyrimethanil		1		
Pyriproxyfen		1		1
Dicofol NOT INCLUDED (EU), no resubmission!		1		
Malathion NOT INCLUDED (RESUBMITTED)	EDC-2	1		
Bromopropylate NOT INCLUDED!				1
Prochloraz NOT INCLUDED!				1

EFSA health evaluation existing MRL's, November 2008.

Active substance	Number of MRL's lowered	Maximum factor lowered MRL
Methomyl	38	50
Methamidophos	3	50
Fenarimol	3	25
Oxydemeton-methyl	7	10
Pirimiphos-methyl	14	100
Procymidon	20	500
Carbendazim	8	5
Fenamiphos	11	5
Ethephon	4	100
Benfuracarb	5	10
Vinclozolin	30	800

Table 3. Samples of crops taken in monitoring program 2008, with trends in percentage MRL violations, comparing origin and previous years.

PRODUCT	Consumption (g/day)	Year EU-coordinated program	Dutch program 2008	samples realised 2008	% samples > MRL 2008	% samples > MRL 2008 Dutch	% samples > MRL 2008 EU	% samples > MRL 2008 non -EU	samples a year 2003-2007	% samples > MRL 2003-2007
Tangerines	13,4	97/02/05/08	200	137	2,2	0,0	2,4	1,9	68	16,3
Orange	93,7	98/02/05/08	200	184	4,3	0,0	1,4	6,4	133	9,5
Apple	74,4	96/01/04/07	125	158	2,5	2,8	2,2	2,4	110	4,6
Pear	10,8	97/02/05/08	100	91	2,2	1,3	25,0	0,0	66	2,1
Peach/nectarine	3,5	98/02/07	150	43	4,7	0,0	2,4	100,0	56	15,2
Plum, including damson	2,2		50	48	0,0	0,0	0,0	0,0	31	4,5
Grape	14,4	96/01/06	250	224	4,9	0,0	3,4	6,7	208	26,6
Strawberry	4,8	96/01/04	150	101	1,0	1,6	0,0	0,0	129	12,7
Banana	19,7	97/02/06	75	54	0,0	0,0	0,0	0,0	41	0,0
Kiwi fruit	2,9		50	62	6,5	0,0	14,3	0,0	32	4,9
Beetroot	4,4		50	34	0,0	0,0	0,0	0,0	17	3,5
Carrot	13,6	98/02/05/08	125	93	2,2	2,5	0,0	0,0	70	3,4
Onion	14,5	04	75	54	0,0	0,0	0,0	0,0	43	2,8
Tomato	26,9	96/01/04	125	148	4,7	1,0	10,8	22,2	115	5,4
Sweet pepper	4,2	99/03/06	250	143	4,2	0,0	7,4	6,5	123	15,4
Pepper	0,0	99/03	150	116	34,5	0,0	0,0	41,7	85	34,0
Cucumber	7,9	00/03/05/08	125	149	6,0	2,6	3,2	14,6	77	7,8
Melon	3,3	99/03	50	63	1,6	100,0	0,0	0,0	52	6,1
Broccoli	4,9		50	70	1,4	0,0	2,2	0,0	38	3,2
Cauliflower	14,9	99/03/06		70	0,0	0,0	0,0	0,0	51	0,8
Red Cabbage	4,2		18	17	0,0	0,0	0,0	0,0	15	0,0
White Cabbage	6,2	00/04/07	17	17	0,0	0,0	0,0	0,0	19	0,0
Lettuce	4,2	96/01/04	200	105	1,0	0,0	3,6	0,0	121	10,8
Iceberg lettuce	3,3	96/01/04	0	98	4,1	3,0	4,8	0,0	65	7,4
Endive	7,3		150	94	1,1	0,0	5,9	0,0	83	7,2
Spinach	8,9	98/02/05/08	125	56	1,8	3,1	0,0	0,0	57	8,7
Beans(fresh)	3,2	97/02/05/08	175	228	15,8	2,6	13,6	19,0	107	12,7
Peas (fresh)	12,6	00/03/06	100	41	12,2	0,0	0,0	12,2	38	10,5
Leek	12,3	04/07	75	73	1,4	1,4	0,0	0,0	50	4,0
Potato	172,6	97/02/05/08	75	70	0,0	0,0	0,0	0,0	56	3,9
Rice	10,1	00/03/05/08	50	36	2,8	0,0	0,0	3,2	17	0,0
Wheat	130,6	00/03/04/06	50	30	3,3	5,6	0,0	0,0	29	0,0
Babyfood			125	75	0,0	0,0	0,0	0,0	0	0,0
Processed products			175	377	4,2	4,8	0,0	6,3	0	0,0
Products in program	695,4		3725	3359	5,0	1,6	3,3	10,7	2201	10,6
Total	838,8		4500	4344	5,9	1,6	3,1	12,4	3550	10,7

Table 4. Alerts to the RASFF system issued by the Netherlands.

Product	Pesticide	Country
Aubergine (eggplant)	omethoate (0.22 mg/kg)	Thailand
Cactus pears	omethoate (0.06 mg/kg) and dimethoate (0.19 mg/kg)	Italy
Chilli pepper	carbofuran (1.2 mg/kg)	Thailand
Coriander	carbofuran (2.9 mg/kg)	Thailand
Cucumber	0.02 mg/kg) and dimethoate ; 0.04 mg/kg)	Thailand

Example of Chlorpyrifos having effects at very low doses, at 0,2 mg/kg.

Neurotoxicology and Teratology. 2009 Aug 28. [Epub ahead of print]

Anxiety in adult female mice following perinatal exposure to chlorpyrifos.

Braquenier JB, Quertemont E, Tirelli E, Plumier JC.

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Epidemiologic studies suggested a possible link between prenatal exposure to organophosphate insecticides (OP) and long-term mental delay and some behavioral troubles. Experimental studies in rats and mice have confirmed that a relatively short exposure to low doses of OP such as chlorpyrifos (CPF) during specific perinatal periods decreased anxiety-like behaviors. In the present study, we report that chronic perinatal exposure (GD15-PND14) to low doses of CPF leads to an increase (and not a decrease) in anxiety-like behaviors of female mouse offspring. Pregnant or lactating female mice were exposed to CPF (0.2; 1; or 5 mg/kg day) by oral treatment during 18 consecutive days. Following a recovery period of several weeks, the anxiety of adult female offspring was determined using neurobehavioral tests (elevated plus-maze and light/dark box tests). Our results showed that CPF-exposed female offspring were more anxious than controls. In addition, the magnitude of anxiety profile alterations depended on the level of exposure to CPF during gestation and lactation with a maximal effect observed at the 1 mg/kg day dose. Our results confirm that OP exposure during the perinatal period can induce long-term alterations in mouse anxiety-like behaviors and suggest that the routes of administration and the duration of OP exposure during brain development may be factors to consider when studying the development of anxiety.

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