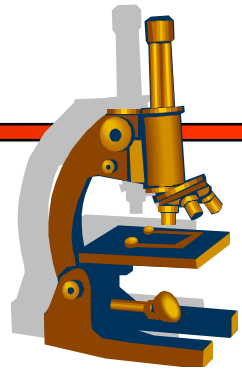
Contaminanti ambientali nella dieta degli italiani: ipotesi di studio

CoAS – PIAS

Annalisa Mupo

Scientific studies



Key words	Pub Med number of publications
Xenobiotics	9.887
Xenobiotics and food	799 (8,08%)
Pesticides	114.066
Pesticides and food	14.706 (12,89%)
Dioxins	13.184
Dioxins and food	1.512 (11,46%)
Heavy Metals	321534
Heavy Metals and food	24984 (7,77%)

Scientific studies: Italian assessment

Key words	Pub Med number of publications
Food contamination	43.826
Food contamination and human health	6.343 (14,4%) (1962/2009)
Food contamination and Italian health	110 (1,73 %)
Xenobiotics and Italian food	5 (0,6%)
Xenobiotics and Italian diet	5 (0,6%)
Pesticides and Italian food	137 (0,9%)
Pesticides and Italian diet	24 (0,1%)
Dioxins and Italian food	18 (1,1%)
Dioxins and Italian diet	6 (0,39%)
Heavy metals and Italian food	210 (0,84%)
Heavy metals and Italian diet	90 (0,36%)

Food contamination and human's health risks

1) Contaminants identification

2) Risks of exposure

3) Risk evaluation

Heavy Metals, Dioxins, Pesticides

↓

DIET

↓

Human Health

Questions and Answers about Dioxins

(updated September 2008)

U.S. Food and Drug Administration
Protecting and Promoting *Your* Health

What levels of dietary dioxin exposure cause adverse health effects in humans?

Known incidents of high dioxin levels in humans have resulted from accidental exposures that are not typical with dietary exposures. Despite a large body of research and data collection, there are numerous questions and uncertainties regarding scientific data on and analysis of dioxin risk. These uncertainties are unlikely to be resolved in the near future.

Exposure to environmental contaminants trough diet: an example

Dietary exposure to dioxin-like compounds in three age groups: Results from the Flemish environment and health study

Maaike Bilau [a,*], Christophe Matthys [a], Willy Bacyens [b], Liesbeth Bruckers [c], Guy De Backer [a], Elly Den Hond [d], Hans Keune [e], Gudrun Koppen [d], Vera Nelen [f], Greet Schoeters [d], Nicolas Van Larebeke [g], Jan L. Willems [a], Stefaan De Henauw [a], On behalf of the Flemish Center of Expertise for Environment and Health

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Levels of PCDD/fs and dl-PCBs in food items

Table 1
Mean (standard deviation) PCDD/F and dl-PCB concentration for each food group

Food group	Expressed in	N	PCDD/Fs	N	dl-PCBs
Meat and meat products					
Chicken	pg CALUX-TEQ/g fat	76	1.2 (1.18)	53	0.9 (0.69)
Turkey	pg CALUX-TEQ/g fat	11	0.6 (0.30)	8	0.6 (0.21)
Pork	pg CALUX-TEQ/g fat	45	0.7 (2.01)	36	0.6 (0.23)
Beef	pg CALUX-TEQ/g fat	134	1.3 (0.69)	133	1.5 (1.50)
Sheep	pg CALUX-TEQ/g fat	11	3.4 (5.58)	11	1.1 (0.83)
Horse	pg CALUX-TEQ/g fat	13	5.6 (4.10)	8	4.9 (3.26)
Fish and seafood					
Shrimps	pg CALUX-TEQ/g product	16	2.0 (0.67)	15	2.2 (1.35)
Mussels	pg CALUX-TEQ/g product	4	1.7 (0.96)	2	2.2 (0.92)
Lean fish[a]	pg CALUX-TEQ/g product	97	0.8 (0.68)	95	0.9 (0.85)
Herring	pg CALUX-TEQ/g product	15	1.4 (0.39)	15	2.1 (1.56)
Mackerel	pg CALUX-TEQ/g product	2	1.0 (0.64)	2	1.0 (0.75)
Salmon	pg CALUX-TEQ/g product	73	1.0 (0.62)	61	1.2 (0.80)
Eel	pg CALUX-TEQ/g product	12	1.2 (0.61)	10	0.8 (0.58)
Smoked fish	pg CALUX-TEQ/g product	30	0.8 (0.38)	30	1.2 (0.83)
Canned fish	pg CALUX-TEQ/g product	27	0.5 (0.22)	38	0.8 (0.64)
Dairy products					
Cheese	pg CALUX-TEQ/g fat	47	1.4 (0.78)	36	1.1 (0.55)
Milk	pg CALUX-TEQ/g fat	274	1.5 (0.71)	237	1.4 (0.78)
Yoghurt	pg CALUX-TEQ/g fat	6	1.1 (0.50)	6	0.9 (0.43)
Other food groups					
Cereals	pg CALUX-TEQ/g product	4	0.3 (0.17)	2	0.6 (0.02)
Egg	pg CALUX-TEQ/g fat	285	1.0 (0.98)	283	1.0 (1.27)
Added fats[b]	pg CALUX-TEQ/g fat	77	0.8 (0.51)	36	1.2 (0.74)

[a] Lean fish: cod, plaice, ray, sole, Nile perch, whiting, anglerfish and turbot.
[b] Added fats: spreads, baking and frying fat.

Basic characteristics and dietary intake of the participants of the study

Table 2
Characteristics and dietary intake of the participants, expressed as medians (P25–P75)

	Mothers	Adolescents			Adults		
		Total	Boys	Girls	Total	Men	Women
N	1172	1636[a]	834	784	1586[a]	774	803
Age (years)[b]	29.6[c]	14.8[c]	14.8	14.8	57.8[c]	58.5[c]	57.0[c]
	(26.8–32.2)	(14.5–15.2)	(14.5–15.2)	(14.6–15.2)	(54.0–60.9)	(54.6–61.3)	(53.6–60.5)
BMI (kg/m^2)[b]	22.4[c]	20.0[c]	19.7[c]	20.4[c]	26.4[c]	27[c]	25.8[c]
	(20.3–25.1)	(18.5–22.0)	(18.3–21.5)	(18.7–22.5)	(24.1–29.4)	(24.8–29.4)	(23.3–29.1)
Meat and meat products ($g\ d^{-1}$)	96	102	111	90	84	96	75
	(60–131)	(67–141)	(78–151)	(56–128)	(51–119)	(61–132)	(45–106)
Fish and seafood ($g\ d^{-1}$)	16	14	15	14	23	23	23
	(10–27)	(7–25)	(7–26)	(7–24)	(13–39)	(14–39)	(13–38)
Dairy products ($g\ d^{-1}$)	233	216	261	185	204	191	214
	(139–378)	(122–367)	(141–412)	(102–311)	(138–303)	(126–294)	(146–312)
Eggs ($g\ d^{-1}$)	8	8	8	8	8	10	7
	(3–14)	(3–14)	(4–16)	(3–14)	(3–14)	(3–17)	(3–14)
Total fat ($g\ d^{-1}$)	68	68	74	62	51	58	45
	(52–92)	(52–92)	(58–102)	(46–82)	(37–70)	(43–79)	(33–60)

Main contributors of dioxin-like substances via food

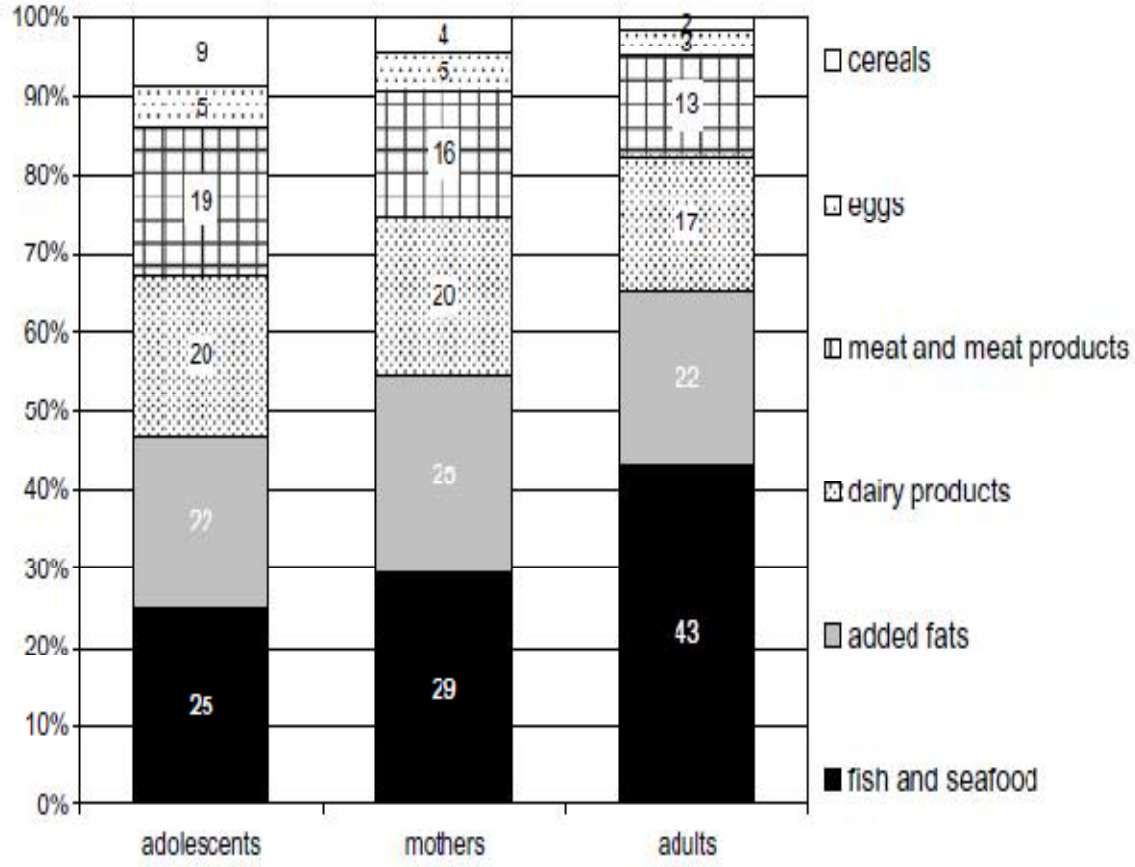

Fig. 2. Estimated average contribution of food groups (%) to the intake of dioxin-like substances in three subgroups of the Flemish population

CoAS – PIAS: working hypothesis

Suitable Experimental Models

Specific Pathologies *vs.* Food Contaminants Concentration

Follow
and
Prevent
Food Contaminations

Concentrazioni di metalli pesanti in soggetti non esposti presumibilmente sani

Elemento	Sangue(mg/100ml)	Plasma/ Siero (mg/100ml)	Urine (mg/l)
Al	?	0.25 – 0.75	?
As	?	?	0.0 – 27.0
Cd	0.2 – 0.7	?	0.2 – 3.2
Cr	?	0.004 – 1.0	0.2 – 2.2
Mn	?	0.07 – 2.0	0.08 – 3.8
Hg	0.5 - 25	?	0.0 – 37.5
Ni	?	0.06 – 0.72	0.4 – 9.6
Pb	5.0 – 49.0	?	7.0 – 60.0
Cu	?	70 - 150	2.0 – 94.0
Se	8.0 – 18.0	?	3 - 47
Zn	?	55 - 170	150 - 1400
Sr	?	?	?
Rb	?	?	?

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