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CORRIGENDUM

Contribution of locally grown foods in cumulative exposure assessments

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Since the publication of the above paper, the authors have identified errors in Table 2a and Table A1. Specifically, the coefficient of variation (CV) of 39.4 for the intake rate (IR_j), (kg j/kg-BW/day) of protected vegetables should be 3.94. Additionally, the intake rate (IR_j) of beets in Table A1, should be 2.2 E-02 (g/kg-BW/d), not 2.2 E-01 (g/kg-BW/d). Revisions of the tables are given below. The corrected values in the Tables do not change our results and conclusions.

Table 2. Summary of mean (CV) for ingestion-related parameters used in the (a) numerator and inhalation parameters in the (b) denominator of the empirical $\theta_{ing/inh}$(fvg) (see Eq. (2) for definitions)

(a)

j	$\overline{C_{j,w}}$(μg BaP/kg j)	IR_j (kg j/kg-BW/day)
Exposed fruits	1.52 (0.4)	1.4E−03 (4.7)[a]
Protected fruits	6.7E−02 (0.3)	1.7E−03 (2.4)[b]
Exposed vegetable	8.3E−01 (0.9)	8.6E−04 (2.0)[c]
Protected vegetable	1.14 (0.3)	3.3E−04 (3.94)[d]
Root vegetable	5.7E−01 (0.6)	1.3E−03 (1.3)[e]
Leafy vegetable	7.1E−01 (1.8)	6.3E−04 (8.7)[f]
Grains	4.6E−01 (0.3)	4.1E−03 (0.9)[g]

(b)

	Mean (CV)
$C_{air\_outdoor}$ (ng/m^3)[h-u]	2.8 (2.6)
C_{air_indoor} (ng/m^3)	Lower bound = 0.1 × $C_{air\_outdoor}$ Upper bound = $C_{air\_outdoor}$
BR (m^3/kg/h][v]	1.5E-02 (0.3)

$\overline{C_{j,w}}$: = intake weighted concentration of chemical, BaP, in food category j. See appendix, Table A1 for the summary and sources of individual concentrations of fvg (C_i) within each food category, j.

IR_j: = intake rate (fresh weight basis) of food category j.

$C_{air\_outdoor}$: = concentration of the chemical, BaP, in outdoor air (ng/m^3). If the average was not given, then it was estimated as the midpoint from reported minimum and maximum concentrations. Since some PAH levels in outdoor air were given on a total, gaseous and/or associated with particle phase, only the total values was used. Where measurements were not specified, the total (gaseous + particle) associated BaP concentration was assumed.

C_{air_indoor} : = concentration of the chemical, BaP, in indoor air.

BR: = breathing rate.

a–g: Unless otherwise noted the original source is the 1989–1991 CSFII (USDA, 1996a) as cited in (EPA, 1997): [a]Table 9-7, [b]Table 9-8, [c]Table 9-9, [d]Table 9-10, [e]Table 9-11, [f]Table 9-21, mean consumption rate and SE for entire US population (g/d) reported, original source is US EPA (1984). Since sample size is not given, cannot convert from SE to standard deviation. Therefore, used the average standard deviation from exposed, protected, and root vegetables. Also, we divided by the lognormally distributed combined (adult and child) body weight with arithmetic mean = 62.0 kg, CV = 0.2 (McKone, 1993).

[g]Table 12-1(per capita intake of total grain, including mixtures).

[h]Average concentration in winter urban air (Hawthorne et al., 1992).

[i]Monitored by the California Air Resources Board air toxics network (cited in CARB, 1997).

[j]Average atmospheric concentration in semirural location (Smith et al., 2001).

[k]Urban site in summer and winter and rural site in summer including summary table of previous measurements (Smith and Harrison, 1996).
[l]Total (particulate and gaseous) outdoor air concentrations of BaP in Chicago (measured) and summarized from previous research in Chicago, Houston, Boston and London (Odabasi et al., 1999).
[m]Total (particulate and gaseous) outdoor air concentrations of BaP in US urban and rural regions (Baek et al., 1991).
[n]BaP concentrations in summer and winter in London and Manchester, England (Coleman et al., 1997).
[o]Outdoor BaP concentrations measured at Los Angeles, CA, Houston, TX and Elizabeth, NJ between July 1999 – May 2000 (Naumova et al., 2002).
[p]Outdoor BaP concentrations during winter of 1986/87 in Columbus, Ohio (Mitra and Ray, 1995).
[q]Outdoor BaP concentrations measured in Pavia, Italy, in February 1996 (Minoia et al., 1997).
[r]Urban ambient BaP concentration measured in Southern California on September 8–9, 1993 (Fraser et al., 1998).
[s]Outdoor BaP concentration measured at high and low traffic density homes in Amsterdam on 19 days during the winter and spring of 1995 (Fischer et al., 2000).
[t]Outdoor BaP concentrations in three areas of Germany: Industrial (Halle-Liepzig and Saarland) and rural Grosshansdorf (nature reserve) in mid-1990s (Grimmer et al., 1997).
[u]50-week average BaP concentration from a residential area with coal heating, a residential area with central oil heating, and an area around a coke plant in 1978–1979 (Grimmer et al., 1981).
[v]BR (m^3/kg/h) = 8/24*(resting BR) + 16/24*(active BR) where the mean BR and (CV) are 1.90E-02 (0.3) and 6.40E-03 (0.2) m^3/kg/h for active and resting BR, respectively (McKone, 1993). A combined adult and child BR used assuming a body weight of 62 kg (McKone, 1993).

Table A1. Information used to calculate the intake weighted concentration, $\overline{C_{j,w}}$ of benzo(a)pyrene in fruit, vegetable and grains (fvgs)

	Min C_i	Max C_i	$\overline{C_i}$	C_i reference	n_{FW}	n_{DW}	$n_{Undes.}$	W (%)[(1)]	IR_i[(2)]
j = exposed fruits									
i = Apple	2.0E−02	60	7.5E−01	a,b,d,k	1	4	3	84.2[(3)]	4.6E−01
Grape	2.0E−02	0.2	2.8E−03	c,d			2	81.3	4.4E−02
Orange peel			1.2E−05	d			1	86.8[(4)]	1.4E−04
Pear	5.0E−2	1.9	6.9E−02	c,d			2	83.8	1.2E−01
Persimmon			4.6E−06	d			1	85.0[(5)]	4.0E−04
Plums	4.0E−02	29.7	2.1E−01	c,d			2	85.2	2.5E−02
Strawberry			ND	d			1	91.6	3.5E−02
j = protected fruits									
Banana	2.0E−02	0.16	1.9E−02	d,e	1		1	74.3	2.2E−01
Cantaloupe			4.4E−04	e	1			89.8	4.4E−02
Grapefruit			1.4E−03	e	1			90.9	6.9E−02[(6)]
Oranges	3.0E−02	0.16	1.3E−02	d,e	1		1	86.8	1.5E−01[(6)]
Pineapple			3.6E−04	d			1	86.5	3.1E−02
j = exposed vegetables									
Cucumber			ND	f			1	96.1	7.2E−02
Eggplant			ND	f			1	91.9	6.2E−03
Mushroom			8.6E−02	c			1	91.8	2.1E−02
Onion greens			1.1E−04	g			1	93.0[(7)]	2.0E−03
Tomatoes	1.0E−02	6.65	4.1E−01	a,e,i,j,k	1	2	2	94.0	4.9E−01
j = protected vegetables									
Corn			2.9E−01	k		1		76.0	2.4E−01
Kidney bean			ND	f			1	80.3[(8)]	1.4E−02
Pumpkin			ND	g			1	91.6	4.4E−03
Soy beans			3.1	a			1	69.1	0
j = root vegetables									
Beet	2.0E−01	0.21	3.1E−03	I		2		87.3	2.2E−02
Carrot	ND	0.22	8.2E−03	e,f,l,y	2	1	1	87.8	1.7E−01
Endive	1.29E−02	50	3.7E−03	l,m,n,y	2	2		93.8	1.1E−03
Leek	7.5E−03	6.6	3.9E−05	j,l,y	1	1	2	83.0	3.9E−05
Onion bulb	ND	7.36	1.5E−02	g,I	2	2	1	90.8	1.1E−01
Potatoes	ND	23.5	0.9E−01	e,g,h,k,o	1	9	3	81.1[(9)]	1.1E + 00[(10)]
Radish roots	ND	1.2	4.8E−05	g,h		1	1	94.8	1.6E−03
Sweet potatoes	ND	0.17	3.3E−03	e,g	1		1	72.8	3.9E−02
j = leafy vegetables									
Broccoli			8.3E−03	e	1			90.7	4.9E−02
Cabbage	ND	20.9	9.7E−02	g,k,l,o,p,y	1	13	2	91.3[(11)]	9.4E−02
Chinese cabbage			1.3E−04	g			1	95.3	4.6E−03

Table A1. (*Continued*)

	Min C_i	Max C_i	$\overline{C_i}$	C_i reference	n_{FW}	n_{DW}	$n_{Undes.}$	W (%)[(1)]	IR_i[(2)]
Cauliflower	1.2E−01	5.1	2.4E−02	c,e	1		1	92.3	1.6E−02
Collard greens			9.1E−03	e	1			93.9	1.9E−02
Kale	4.7E−01	48.6	1.0E−02	e,j,q,r–t	4		3	84.5	1.5E−03
Lettuce	ND	150	1.5E−01	k,m,u–w	10	15	2	95.4[(12)]	2.3E−01[(13)]
Mustard greens			1.9E−03	e	1			90.8	1.5E−02
Parsley leaf and stem (tops)			5.2E−02	k			1	88.3	3.7E−03
Spinach	9.0E−02	20	5.5E−02	e,f,k,j,m,s	2	2	2	91.6	4.4E−02
Turnip greens			1.5E−03	e	1			91.1	1.5E−02
j = grains									
Barley-grain	3.0E−01	3.6	1.2E−01	k,x,z	1	3		10.1	1.5E−01[(15)]
Oats-grain	6.3E−02	0.4	2.0E−02	k,z		3		8.2	8.3E−02
Rye	0.16	4.1	2.0E−02	x	1	2		10.4	4.3E−03[(16)]
Wheat-grain	1.0E−01	3.5	6.1E−01	k,x,z	1	3		10.2[(14)]	1.4E+00[(17)]

The number of concentrations, C_i (μg/kg), reported on a fresh weight (n_{FW}), dry weight (n_{DW}), or undesignated weight ($n_{Undes.}$) basis is also specified along with the water content (W) (%) and intake rate (IR_i) (g/kg BW-d) of each fvg (i). If only one value was reported for a specific fruit, vegetable or grain, C_i refers to $\overline{C_i}$. C_i references are given as letters, below the numerical footnotes.

(1)Average water content in edible portion of food (EPA, 1997; Table 9-27 for f&vs and Table 12-21for grain) used to convert from DW to FW concentration, based on Eq. (A.3).

(2)'As consumed mean per capita intake rates' (g/kg BW-d) (EPA, 1997; from Table 9-13 for f&vs and Table 12-12 for grains, original source 1989–91 CSFII).

(3)Assume average W of apples with and without skin (EPA, 1997; Table 9-27).

(4)Assume same water content as the 'oranges- unspecified' (EPA, 1997; Table 9-27).

(5)Since W is not reported for persimmons, assume the average of Ws for exposed fruits (EPA, 1997; Table 9-27).

(6)Pulp only intake (EPA, 1997; Table 9-13, original data from 1977-78 NFCS).

(7)Since W not specified for onion greens, assume the average of Ws for exposed vegetables (EPA, 1997; Table 9-27).

(8)Average W of lima and snap beans (EPA, 1997; Table 9-27).

(9)Average W of potatoes (White) peeled and potatoes (white) whole from (EPA, 1997; Table 9-27).

(10)Sum of all potato related intake (EPA, 1997; Table 9-13, data originally from 1977-78 NFCS).

(11)Average W of red and savoy cabbage (EPA, 1997; Table 9-27).

(12)Average W of iceberg and romaine lettuce (EPA, 1997; Table 9-27).

(13)Intake of all lettuce varieties (EPA, 1997; Table 9-13 original data from 1977-78 NFCS).

(14)Average of all Ws for wheat-related items (EPA, 1997; Table 12-21).

(15)Assume average intake of all grain intake (EPA, 1997; Table 12-12, original data from 1977–78 NFCS).

(16)Sum of rye-rough, rye-germ, and rye-flour (EPA, 1997; Table 12-12, original data from 1977–78 NFCS).

(17)Sum of rough, germ, bran and flour wheat intake (EPA, 1997; Table 12-12, original data from NFCS 1977, 78).

[a]As cited in IARC (1973).
[b]Fritz (1971) as cited in Edwards (1983).
[c]Kolar et al. (1975) as cited in Santodonato et al. (1981).
[d]Shiraishi et al. (1975) as cited in Santodonato et al. (1981).
[e]Kazerouni et al. (2001).
[f]Shiraishi et al. (1973), as cited in Santodonato et al. (1981).
[g]Shiraishi et al. (1974) as cited in Santodonato et al. (1981).
[h]Archer et al. (1979) as cited in IARC (1983).
[i]Wang and Meresz (1981) as cited in Edwards (1983).
[j]Grimmer and Hildebrandt (1965a).
[k]Kolar et al. (1975) as cited in Edwards (1983).
[l]Voutsa and Samara (1998).
[m]Graf and Diehl (1966) as cited in Edwards (1983).
[n]Prinsen 1979 as cited in Vaessen et al. (1984).
[o]Shkodich and Litvinov (1979) as cited in Edwards (1983).
[p]Sokolowska (1980) as cited in Edwards (1983).
[q]Grimmer (1981), as cited in Vaessen et al. (1984).
[r]Vaessen et al. (1984).
[s]Vaessen et al. (1988).
[t]Hetteche (1971) as cited in Santodonato et al. (1981).
[u]Larsson et al. (1983).
[v]Wickstrom et al. (1986).
[w]Larsson and Sahlberg (1981) as cited in Edwards (1983).
[x]Grimmer and Hildebrandt (1965b).
[y]Kipopoulou et al. (1999).
[z]Boling (1964) as cited in Edwards (1983).