

codex alimentarius commission



FOOD AND AGRICULTURE
ORGANIZATION
OF THE UNITED NATIONS

WORLD
HEALTH
ORGANIZATION



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Agenda Item 5

CX/PR 04/3

JOINT FAO/WHO FOOD STANDARDS PROGRAMME

CODEX COMMITTEE ON PESTICIDE RESIDUES

Thirty-sixth Session

New Delhi, India, 19 - 24 April 2004

GEMS/FOOD PROGRESS REPORT OF DIETARY INTAKES¹

Elaboration of the GEMS/Food Consumption Cluster Diets

1. At the Thirty-first session of the Committee, WHO presented its efforts to develop more representative diets as recommended by an earlier FAO/WHO expert consultation.² Using a cluster analysis approach, 13 Consumption Cluster Diets were produced.³ At the Thirty-fifth session, the Committee was informed of progress in developing the new diets although it was noted that major data gaps were encountered⁴. The Committee welcomed this progress and encouraged countries to cooperate in providing necessary data.

2. Because average food balance sheet data for the period 1997-2001 have recently become available to GEMS/Food, it was decided that the new information should be used as the basis for the new Consumption Cluster Diets. Presently a list of countries with missing commodity data is being developed. This will be followed by data gathering efforts focused on cluster/country/commodity combinations specific data gaps.

Revision of the GEMS/Food Regional Diets

3. GEMS/Food has reviewed the existing five GEMS/Food Regional Diets and has produced a revised version⁵, which takes into account comments received from the Netherlands and the Croplife International. The changes correct small computational errors and provide clarifications concerning the food codes used. Consequently, the revisions are not believed to significantly alter previous exposure assessments. Copies of the revised GEMS/Food Regional Diets are available on request and are available on the WHO Food Safety website <http://www.who.int/foodsafety/chem/en/Final%20for%20Web.pdf>

¹ Paper prepared by Food Safety Department, World Health Organization, Geneva, Switzerland

² Food consumption and exposure assessment of chemicals. Report of a FAO/WHO consultation, 10-14 February 1997, Geneva, Unpublished Document WHO/FSF/FOS97.5, WHO, Geneva (1997)

³ Progress report by WHO on the revision of GEMS/Food Regional Diets, CX/PR 99/3, February 1999

⁴ ALINORM 03/24A, para 33

⁵ GEMS/Food Regional Diets, Regional per capita consumption of raw and semi-processed agricultural commodities, GEMS/Food Programme, WHO/SDE/FOS revised September 2003, WHO, Geneva (2003)

Addition of Dietary Exposure Experts to JMPR

4. In an effort to improve the quality, consistency and timeliness of JMPR exposure assessments, FAO and WHO have agreed to add two new members to JMPR beginning in 2004 to assist in the assessment of dietary exposure to pesticide residues. One member would have particular expertise in food consumption studies of human populations (including specific sub-populations like children and the elderly) and modelling dietary intakes, including probabilistic approaches. The other member would support the evaluation of processing studies to determine the concentration of pesticide residues occurring in food items, both semi-processed and processed, using statistically validated protocols. The Call for experts is available at <http://www.who.int/foodsafety/chem/en/CallforExpert%20JMPR.pdf> or by contacting the GEMS/Food Manager, WHO Food Safety Department⁶.

International Estimated Short Term Intakes for Carbofuran (96)

5. At the Thirty-fifth session, GEMS/Food was requested by the Committee to perform a full acute intake assessment of carbofuran (96) in the light of intake concerns expressed by the Delegation of Australia and the Observer from the EC⁷. The acute RfD for carbofuran was estimated by the 2002 JMPR to be 0.009 mg/kg body weight. International Estimated Short-term Intakes (IESTIs) were calculated for commodities for which maximum residue levels and STMR and/or HR values were established. IESTI calculations were performed using procedures recommended by the 2003 JMPR, including the omnibus variability factor of 3.

6. The results for the general population and children ages 6 and under are given in the attached Tables 1 and 2, respectively. Except for the consumption of oranges, sweet, sour by children, none of the IESTIs for other commodities exceeded 100% of the acute RfD for children and for the general population. Residues of carbofuran on oranges are the result of the use of carbosulfan. While washing does not appear to reduce levels of carbofuran on oranges, preliminary processing studies with orange juice and orange oil suggest that residues are mainly associated with the peel.

7. If the variability factors used previously by the JMPR are used instead of default of 3, IESTIs for children for banana, cantaloupe, cucumber and oranges, sweet, sour exceeded the acute RfD. On the other hand, none of the IESTIs for the general population exceeded the acute RfD. The IESTI calculations for the general population and children ages 6 and under using the standard variability factors prior to the 2003 JMPR are given in the attached Tables 3 and 4.

⁶ GEMS/Food Manager, Food Safety Department, World Health Organization, CH-1211 Geneva 27, Switzerland (facsimile 022 791 4807)

⁷ ALINORM 03/24A, para 93

Table 1

**CARBOFURAN
(96) :****International Estimated Short Term Intake (IESTI) for
General
Population**Acute RfD= 0.009 mg/kg bw/day (9
µg/kg bw/day)Maximum
%ARfD: 50%

Codex Code	Commodity	STMR or STMR- P mg/kg	HR or HR-P mg/kg	Country	Large portion diet					Unit weight g	Unit weight Country	% edible portion	Unit weight, edible portion, g	Variabil ity factor	Case	IESTI µg/kg bw/day	% acute RfD round ed
					Body weight (kg)	Large portion g/kg bw/day	Large portion, g/person	Large portion correc tion factor	Large portion, correcte d, g/person								
FI 0327	Banana	-	0.1	SAF	55.7	11.00	613	1.00	613	708	USA	68%	481	3	2a	2.83	30%
VC 4199	Cantaloupe	-	0.13	USA	65.0	9.32	606	1.00	606	552	USA	50%	276	3	2a	2.32	30%
SB 0716	Coffee beans	0.1	-	NLD	63.0	1.04	66	1.00	66	-	-	-	ND	ND	3	0.10	1%
VC 0424	Cucumber	-	0.29	NLD	63.0	4.97	313	1.00	313	301	USA	95%	286	3	2a	4.07	50%
MO 0096	Edible offal of cattle, goats, horses, pigs & sheep	0.05	-	FRA	62.3	4.44	277	1.00	277	-	-	-	ND	ND	1	ND	-
MM 0096	Meat of cattle, goats, horses, pigs & sheep	0.05	-	AUS	67.0	7.76	520	1.00	520	-	-	-	ND	ND	1	ND	-
ML 0106	Milks	0.05	-	USA	65.0	37.94	2466	1.00	2466	-	-	-	ND	ND	3	1.90	20%
JF 0004	Orange juice	0.001	-	-	-	ND	ND	1.00	ND	-	-	-	ND	ND	3	ND	-
FC 0004	Oranges, sweet, sour (includes orange-like hybrids) 1/	-	0.5	USA	65.0	8.68	564	1.00	564	131	USA	73%	96	3	2a	0.58	60%
VR 0589	Potato	-	0.05	NLD	63.0	10.90	687	1.00	687	216	UNK	100%	216	3	2a	0.89	10%
CM 0649	Rice, husked	-	0.042	JPN	52.6	6.07	319	1.00	319	-	-	-	ND	ND	3	ND	-
GC 0651	Sorghum	-	0.1	USA	65.0	0.27	18	1.00	18	-	-	-	ND	ND	3	ND	-
VC 0431	Squash, summer	-	0.13	FRA	62.3	5.50	343	1.00	343	196	USA	95%	186	3	2a	1.49	20%
GS 0659	Sugar cane	0.1	-	SAF	55.7	1.60	89	1.00	89	-	-	-	ND	ND	ND	ND	-
SO 0702	Sunflower seed	-	0.1	USA	65.0	2.97	193	1.00	193	-	-	-	ND	ND	3	ND	-
VO 0447	Sweet corn (corn- on-the-cob)	-	0.1	USA	65.0	5.65	367	1.00	367	215	UNK	58%	125	3	2a	0.95	10%

1/ Residues of carbofuran and metabolites arising from the use of
carbosulfan

Table 2

CARBOFURAN
(96) :International Estimated Short Term Intake (IESTI)
for
Children 6 Years Old and
LessAcute RfD= 0.009 mg/kg bw/day (9
µg/kg bw/day)Maximum
%ARfD:

90%

Codex Code	Commodity	STMR or STMR- P mg/kg	HR or HR-P mg/kg	Country	Large portion diet					Unit weight				Variability factor	Case	IESTI µg/kg bw/day	% acute RfD rounded
					Body weight (kg)	Large portion g/kg bw/day	Large portion, g/person	Large portion correc tion factor	Large portion, correcte d, g/person	Unit weight , g	Country	% edib le porti on	Unit weight, edible portion, g				
FI 0327	Banana	-	0.1	JPN	15.9	19.61	312	1.00	312	708	USA	68%	481	3	2b	5.88	70%
VC 4199	Cantaloupe	-	0.13	USA	15.0	17.98	270	1.00	270	552	USA	50%	276	3	2b	7.01	80%
SB 0716	Coffee beans	0.1	-	NLD	17.0	1.12	19	1.00	19	-	-	-	ND	ND	3	0.11	1%
VC 0424	Cucumber	-	0.29	NLD	17.0	9.53	162	1.00	162	301	USA	95%	286	3	2b	8.29	90%
MO 0096	Edible offal of cattle, goats, horses, pigs & sheep	0.05	-	FRA	17.8	11.39	203	1.00	203	-	-	-	ND	ND	1	ND	-
MM 0096	Meat of cattle, goats, horses, pigs & sheep	0.05	-	AUS	19.0	13.72	261	1.00	261	-	-	-	ND	ND	1	ND	-
ML 0106	Milks	0.05	-	USA	15.0	85.71	1286	1.00	1286	-	-	-	ND	ND	3	4.29	50%
JF 0004	Orange juice	0.001	-	-	-	ND	ND	1.00	ND	-	-	-	ND	ND	3	ND	-
FC 0004	Oranges, sweet, sour (includes orange-like hybrids) 1/	-	0.5	UNK	14.5	34.14	495	1.00	495	131	USA	73%	96	3	2a	2.37	260%
VR 0589	Potato	-	0.05	SAF	14.2	21.10	300	1.00	300	216	UNK	100 %	216	3	2a	2.58	30%
CM 0649	Rice, husked	-	0.042	FRA	17.8	12.50	223	1.00	223	-	-	-	ND	ND	3	ND	-
GC 0651	Sorghum	-	0.1	-	-	ND	ND	1.00	ND	-	-	-	ND	ND	3	ND	-
VC 0431	Squash, summer	-	0.13	AUS	19.0	11.52	219	1.00	219	196	USA	95%	186	3	2a	4.05	40%
GS 0659	Sugar cane	0.1	-	SAF	14.2	4.20	60	1.00	60	-	-	-	ND	ND	ND	ND	-
SO 0702	Sunflower seed	-	0.1	USA	15.0	1.59	24	1.00	24	-	-	-	ND	ND	3	ND	-
VO 0447	Sweet corn (corn- on-the-cob)	-	0.1	UNK	14.5	11.09	161	1.00	161	215	UNK	58%	125	3	2a	2.83	30%

1/ Residues of carbofuran and metabolites arising from the use of
carbosulfan

Table 3

**CARBOFURAN
(96) :****International Estimated Short Term Intake (IESTI) for
General Population (using standard variability factors prior to 2003
JMPR)**Acute RfD= 0.009 mg/kg bw/day (9
µg/kg bw/day)Maximum
%ARfD:

70%

Codex Code	Commodity	STMR or STMR- P mg/kg	HR or HR-P mg/kg	Country	Large portion diet					Unit weight , g	Unit weight Country	% edible portion	Unit weight, edible portion, g	Variabil ity factor	Case	IESTI µg/kg bw/day	% acute RfD rounded
					Body weight (kg)	Large portion g/kg bw/day	Large portion, g/person	Large portion correc tion factor	Large portion, correcte d, g/person								
FI 0327	Banana	-	0.1	SAF	55.7	11.00	613	1.00	613	708	USA	68%	481	5	2a	4.56	50%
VC 4199	Cantaloupe	-	0.13	USA	65.0	9.32	606	1.00	606	552	USA	50%	276	5	2a	3.42	40%
SB 0716	Coffee beans	0.1	-	NLD	63.0	1.04	66	1.00	66	-	-	-	ND	ND	3	0.10	1%
VC 0424	Cucumber	-	0.29	NLD	63.0	4.97	313	1.00	313	301	USA	95%	286	5	2a	6.71	70%
MO 0096	Edible offal of cattle, goats, horses, pigs & sheep	0.05	-	FRA	62.3	4.44	277	1.00	277	-	-	-	ND	ND	1	ND	-
MM 0096	Meat of cattle, goats, horses, pigs & sheep	0.05	-	AUS	67.0	7.76	520	1.00	520	-	-	-	ND	ND	1	ND	-
ML 0106	Milks	0.05	-	USA	65.0	37.94	2466	1.00	2466	-	-	-	ND	ND	3	1.90	20%
JF 0004	Orange juice	0.001	-	-	-	ND	ND	1.00	ND	-	-	-	ND	ND	3	ND	-
FC 0004	Oranges, sweet, sour (includes orange-like hybrids) 1/	-	0.5	USA	65.0	8.68	564	1.00	564	131	USA	73%	96	7	2a	0.88	100%
VR 0589	Potato	-	0.05	NLD	63.0	10.90	687	1.00	687	216	UNK	100%	216	7	2a	1.57	20%
CM 0649	Rice, husked	-	0.042	JPN	52.6	6.07	319	1.00	319	-	-	-	ND	ND	3	ND	-
GC 0651	Sorghum	-	0.1	USA	65.0	0.27	18	1.00	18	-	-	-	ND	ND	3	ND	-
VC 0431	Squash, summer	-	0.13	FRA	62.3	5.50	343	1.00	343	196	USA	95%	186	7	2a	3.05	30%
GS 0659	Sugar cane	0.1	-	SAF	55.7	1.60	89	1.00	89	-	-	-	ND	ND	ND	ND	-
SO 0702	Sunflower seed	-	0.1	USA	65.0	2.97	193	1.00	193	-	-	-	ND	ND	3	ND	-
VO 0447	Sweet corn (corn- on-the-cob)	-	0.1	USA	65.0	5.65	367	1.00	367	215	UNK	58%	125	7	2a	1.72	20%

1/ Residues of carbofuran and metabolites arising from the use of
carbosulfan

Table 4

**CARBOFURAN
(96) :****International Estimated Short Term Intake (IESTI) for
Children 6 Years Old and Less (using standard variability factors prior to 2003
JMPR)**Acute RfD= 0.009
mg/kg bw/day (9
µg/kg bw/day)Maximum
%ARfD: 150%

Codex Code	Commodity	STMR or STMR- P mg/kg	HR or HR-P mg/kg	Country	Large portion diet					Unit weight , g	Unit weight Country	% edible portion	Unit weight, edible portion, g	Variability factor	Case	IESTI µg/kg bw/day	% acute RfD rounded
					Body weight (kg)	Large portion g/kg bw/day	Large portion, g/person	Large portion correcti on factor	Large portion, correcte d, g/person								
FI 0327	Banana	-	0.1	JPN	15.9	19.61	312	1.00	312	708	USA	68%	481	5	2b	9.81	110%
VC 4199	Cantaloupe	-	0.13	USA	15.0	17.98	270	1.00	270	552	USA	50%	276	5	2b	11.69	130%
SB 0716	Coffee beans	0.1	-	NLD	17.0	1.12	19	1.00	19	-	-	-	ND	ND	3	0.11	1%
VC 0424	Cucumber	-	0.29	NLD	17.0	9.53	162	1.00	162	301	USA	95%	286	5	2b	13.82	150%
MO 0096	Edible offal of cattle, goats, horses, pigs & sheep	0.05	-	FRA	17.8	11.39	203	1.00	203	-	-	-	ND	ND	1	ND	-
MM 0096	Meat of cattle, goats, horses, pigs & sheep	0.05	-	AUS	19.0	13.72	261	1.00	261	-	-	-	ND	ND	1	ND	-
ML 0106	Milks	0.05	-	USA	15.0	85.71	1286	1.00	1286	-	-	-	ND	ND	3	4.29	50%
JF 0004	Orange juice	0.001	-	-	-	ND	ND	1.00	ND	-	-	-	ND	ND	3	ND	-
FC 0004	Oranges, sweet, sour (includes orange-like hybrids) 1/	-	0.5	UNK	14.5	34.14	495	1.00	495	131	USA	73%	96	7	2a	3.69	410%
VR 0589	Potato	-	0.05	SAF	14.2	21.10	300	1.00	300	216	UNK	100%	216	7	2a	5.62	60%
CM 0649	Rice, husked	-	0.042	FRA	17.8	12.50	223	1.00	223	-	-	-	ND	ND	3	ND	-
GC 0651	Sorghum	-	0.1	-	-	ND	ND	1.00	ND	-	-	-	ND	ND	3	ND	-
VC 0431	Squash, summer	-	0.13	AUS	19.0	11.52	219	1.00	219	196	USA	95%	186	7	2a	9.14	100%
GS 0659	Sugar cane	0.1	-	SAF	14.2	4.20	60	1.00	60	-	-	-	ND	ND	ND	ND	-
SO 0702	Sunflower seed	-	0.1	USA	15.0	1.59	24	1.00	24	-	-	-	ND	ND	3	ND	-
VO 0447	Sweet corn (corn- on-the-cob)	-	0.1	UNK	14.5	11.09	161	1.00	161	215	UNK	58%	125	7	2a	6.27	70%

1/ Residues of carbofuran and metabolites arising from the use of
carbosulfan