

codex alimentarius commission



FOOD AND AGRICULTURE
ORGANIZATION
OF THE UNITED NATIONS

WORLD
HEALTH
ORGANIZATION



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Agenda Item 5

CX/PR 06/38/3

JOINT FAO/WHO FOOD STANDARDS PROGRAMME

CODEX COMMITTEE ON PESTICIDE RESIDUES

Thirty-eighth Session

Hotel Vila Gale, Fortaleza, Brazil, 3 - 8 April 2006

GEMS/FOOD PROGRESS REPORT OF DIETARY INTAKES¹

Elaboration of the GEMS/Food Consumption Cluster Diets

1. As part of its mandate to assess the potential exposure of populations to chemicals in food, GEMS/Food has been responsible for estimating regional dietary patterns of raw and semi-processed food commodities. Based on selected FAO Food Balance Sheets, the GEMS/Food Regional Diets were originally developed to assess dietary exposure to radionuclide contamination in the aftermath of the Chernobyl incident. Beginning in 1989 these diets were used to estimate exposure to pesticides that had been reviewed by the Joint FAO/WHO Meeting on Pesticide Residues. These estimates were used by the Codex Committee on Pesticide Residues as part of the risk assessment of draft Maximum Residue Limits for pesticides under consideration.²

2. At the Thirty-first session of the Committee, WHO presented its proposal for developing more accurate and representative diets.³ Using a cluster analysis approach⁴, thirteen GEMS/Food Consumption Cluster Diets were presented based on FAO Food Balance Sheet data available at that time. At its last session, the Committee was informed average Food Balance Sheet data for the period 1997-2001 had been used to re-calculate the diets although certain data gaps remained. The Committee

¹ Paper prepared by Food Safety, Zoonoses and Foodborne Diseases Department, World Health Organization, Geneva, Switzerland

² The GEMS/Food Regional Diets have been used by the Joint FAO/WHO Expert Committee on Food Additives to estimate long-term dietary exposure to contaminants and toxins in food. The diets are used by the Codex Committee on Food Additives and Contaminants as a screening tool in determining if a Codex Standard for a contaminant or toxin in a food or food group is warranted from a public health perspective (See the Preamble to the Codex General Standard for Contaminants and Toxins in Food).

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

⁴ Barraij, L. and B. Petersen (1997) 'A method for revising and redefining regional diets for use in estimating intake of pesticides', Presented at the Joint FAO/WHO Consultation on Food Consumption and Exposure Assessment of Chemicals, 10-14 February 1997, Geneva.

welcomed this progress and agreed that a Circular Letter should be sent to counties to request their cooperation in providing the necessary data.⁵

3. Estimated average consumption for most foods in the thirteen GEMS/Food Consumption Cluster Diets were calculated using average FAO Food Balance Sheet data for the period 1997-2001. Average intake for each food item at the cluster level was weighted by the population size of the reporting country. Where no data was reported for a particular food item in a country, the country was not used in the derivation of the weighted average. No match could be found in the FAO database for 58 of the 383 food commodities and groups included in the diets. Intakes for these missing foods were estimated using various methods. For example, consumption amounts for some of these commodities were estimated from a broader food group in the FAO database, e.g., the FAO database does not differentiate between the various types of lettuce. In other cases, a food identified by a Codex code was represented by the sum of several "intermediate" foods in the FAO database. In addition to the Codex Circular Letter sent to all countries, specific questionnaires were sent to certain countries to obtain information from other sources, such as national food consumption surveys. Where consumption was low but could not be quantified, a default value of 0.1 grams per person per day was used. Accordingly, the thirteen GEM/Food Consumption Cluster Diets are now complete and available for use in intake calculations (See <http://www.who.int/foodsafety/chem/gems/en/index1.html>)

4. In order to assess the possible impact of the new diets on the exposure assessment of pesticide residues, an example calculation was performed to compare the previous GEMS/Food Regional Diets with the new Consumption Cluster Diets (See attached International Estimated Daily Intake (IEDI) sheets). The example includes MRLs for a range of fruits, vegetables and meats. For the Regional Diets, the IEDIs ranged from 5 to 9% of the ADI and for the Consumption Cluster Diets, the IEDIs ranged from 7 to 13% of the ADI. Because the average total food consumption in grams has increased by about one-third since the previous diets were developed, the impact on dietary intake of pesticide residues is also expected to increase in a similar fashion.

5. Expressed as average daily per capita food consumption, these diets should not be used for assessing risks posed by hazards which cause effects after short-term exposure. Diets appropriate for estimating short-term high percentile exposure are available for this purpose (See <http://www.who.int/foodsafety/chem/gems/en/index3.html>)

6. GEMS/Food would like to thank Member countries who provide information and support for this work and in particular the French Food Safety Agency. For further information on GEMS/Food diets, contact the GEMS/Food Manager, Department of Food Safety, Zoonoses and Foodborne Diseases (FOS), WHO, Geneva, Switzerland - e-mail: moyg@who.int; fax: +41 22 791 4807.

⁵ ALINORM 05/28/24, para 61

INTERNATIONAL ESTIMATED DAILY INTAKE (IEDI)

PESTICIDE Code - XX
 Name - Example
 ADI = 0.01 mg/kg bodyweight or 0.6 mg/person

Commodity		MRL mg/kg	Notes	STMR mg/kg	Cluster A		Cluster B		Cluster C		Cluster D		Cluster E	
Code	Name				Diet g/day	IEDI mg/day	Diet g/day	IEDI mg/day	Diet g/day	IEDI mg/day	Diet g/day	IEDI mg/day	Diet g/day	IEDI mg/day
VA 35	Bulb vegetables	2		0.05	8.5	0.0004	60	0.0030	37.4	0.0019	37.3	0.0019	31.9	0.0016
GC 80	Cereal grains	0.5		0.02	357	0.0071	570.2	0.0114	688.8	0.0138	486.1	0.0097	303.6	0.0061
FC 1	Citrus fruits	0.6		0.05	15.7	0.0008	93.7	0.0047	83	0.0042	27.9	0.0014	50	0.0025
PE 112	Eggs Fruiting vegetables,	0.5		0.1	2.5	0.0003	29.7	0.0030	25.1	0.0025	24.5	0.0025	37.8	0.0038
VC 45	Cucurbits	0.5		0.1	26.6	0.0027	107.5	0.0108	96	0.0096	82.3	0.0082	25.3	0.0025
VL 53	Leafy vegetables	0.2		0.05	6.1	0.0003	45.5	0.0023	11	0.0006	27.2	0.0014	18.6	0.0009
VP 60	Legume vegetables	0.2		0.05	2.4	0.0001	23.1	0.0012	18	0.0009	1.6	0.0001	26.4	0.0013
MM 95	Meat	0.6	(fat)	0.2	5.6	0.0011	23.2	0.0046	7.7	0.0015	11	0.0022	18	0.0036
ML 106	Milks	0.02	F	0.006	68.8	0.0004	190.7	0.0011	79.3	0.0005	302.5	0.0018	179.6	0.0011
FP 9	Pome fruits	0.2		0.05	0.5	0.0000	84.2	0.0042	21.9	0.0011	45.3	0.0023	61.7	0.0031
PM 110	Poultry meat	0.5	(fat)	0.2	0.7	0.0001	6	0.0012	3.2	0.0006	2.4	0.0005	6.1	0.0012
VD 70	Pulses	0.2		0.05	47.6	0.0024	26.8	0.0013	19.4	0.0010	14.8	0.0007	15.8	0.0008
VR 75	Root and tuber vegetables	0.5		0.1	584	0.0584	280.7	0.0281	69.3	0.0069	243.7	0.0244	297.2	0.0297
					TOTAL									
					=	0.07416		0.076843		0.045007		0.056972		0.05822
					% ADI									
					=	12%		13%		8%		9%		10%