

Pesticide residues in food 2008

Joint FAO/WHO Meeting on
Pesticide Residues

EVALUATIONS 2008

PART I – RESIDUES



World Health
Organization



Food and Agriculture
Organization of
the United Nations

Pesticide residues in food 2008

Evaluations Part I – Residues

FAO
PLANT
PRODUCTION
AND PROTECTION
PAPER

194

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Joint Meeting of the
FAO Panel of Experts on Pesticide Residues
in Food and the Environment
and the
WHO Core Assessment Group on Pesticide Residues
Rome, Italy, 9–18 September 2008

Monographs containing summaries or residue data and toxicological data considered at the 2008 JMPR, together with recommendations, are available upon request from FAO or WHO under the title:

Pesticide residues in food 2008
Evaluations
Part I: Residues
FAO Plant Production and Protection Paper

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INTERNATIONAL PROGRAMME ON CHEMICAL SAFETY

The preparatory work for the toxicological evaluation of pesticide residues carried out by the WHO Expert Group on Pesticide Residues for consideration by the FAO/WHO Joint meeting on Pesticide Residues in Food and the Environment is actively supported by the International Programme on Chemical Safety (IPCS).
IPCS is a joint venture of the United Nations Environment Programme, the International Labour Organization and the World Health Organization. One of the main objectives of IPCS is to carry out and disseminate evaluations of the effects of chemicals on human health and the quality of the environment.

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^{2/} New compound.

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ABBREVIATIONS

(Well-known abbreviations in general use are not included. Specific abbreviations for pesticide degradation products, etc., may be used in the monographs and these are either identified where first used or in a table within the monograph. Two-letter codes for pesticide formulations are given in the Manual on development and use of FAO and WHO specifications for pesticides, 1st Ed., FAO Plant Production and Protection Paper 173, FAO, Rome, 2002.)

ACN	acetonitrile
ADI	acceptable daily intake
AFID	alkali flame-ionization detection or detector (equivalent to TSD, forerunner of NPD)
ai	active ingredient
AR	Applied radioactivity
ARfD	acute reference dose
AUC	area under the curve for concentration–time
BBCH	Biologische Bundesanstalt, Bundessortenamt and Chemical industry.
BMDL ₁₀	benchmark-dose lower 95% confidence level
bw	body weight
CA	Chemical Abstracts
CAC	Codex Alimentarius Commission
CAS	Chemical Abstracts Services
CCN	Codex classification number (for compounds or commodities)
CCPR	Codex Committee on Pesticide Residues
CCRVDf	Codex Committee on Residue of Veterinary Drugs in Food
CEC	cation exchange capacity
CI	chemical ionization
CV	coefficient of variation (RSD)
d	days
DAT	days after (last) treatment
DCM	dichloromethane
DFG	Deutsche Forschungsgemeinschaft
DT ₅₀	time for 50% decomposition (i.e., half-life)
DT ₉₀	time for 90% decomposition
2D-TLC	two dimensional thin layer chromatography
dw	dry weight
ECD	electron capture detection or detector
EI	electron-impact (ionization), now more usually electron ionization
EPA	Environmental Protection Agency (usually US EPA)
eq	residue expressed as ai equivalent

F ₁	first filial generation
F ₂	second filial generation
FAO	Food and Agriculture Organization of the United Nations
FID	flame-ionization detection or detector
FPD	flame-photometric detection or detector
GAP	good agricultural practice(s)
GC	gas chromatography; the detector system used is usually also abbreviated as a suffix
GC-NPD	gas chromatography coupled with Nitrogen-Phosphorous detector
GEMS/Food	Global Environment Monitoring System–Food Contamination Monitoring and Assessment Programme
GLP	good laboratory practice (i.e. the defined system, not in the general sense)
GPC	gel-permeation chromatography
GSH	glutathione
HPLC	high-performance liquid chromatography
HPLC-MS	high-performance liquid chromatography – mass spectrometry
HPLC-UV	high-performance liquid chromatography with UV absorption detection
h	hour
HR	highest residue in the edible portion of a commodity found in trials used to estimate a maximum residue level in the commodity
HR-P	highest residue in a processed commodity calculated by multiplying the HR of the raw commodity by the corresponding processing factor
IEDI	international estimated daily intake
IESTI	international estimate of short-term dietary intake
IPCS	International Programme on Chemical Safety
IR	infrared spectroscopy
ISO	International Organization for Standardization
ITD	ion-trap detector or detection
IUPAC	International Union of Pure and Applied Chemistry
JECFA	Joint Expert Committee on Food Additives
JMPR	Joint Meeting on Pesticide Residues
JMPS	Joint FAO/WHO Meeting on Pesticide Specifications
LC	liquid chromatography

LC-MS	liquid chromatography – mass spectrometry
LOAEL	lowest-observed-adverse-effect level
LOAEC	lowest-observed-adverse-effect concentration
LOD	limit of detection
LOQ	limit of quantification
LSC	liquid scintillation counting or counter
M	molar = mole/L
MID	multiple ion detection (mass spectrometric)
MRL	Maximum Residue Limit. MRLs include <u>draft</u> MRLs and <u>Codex</u> MRLs (CXLs). The MRLs recommended by the JMPR on the basis of its estimates of maximum residue levels enter the Codex procedure as draft MRLs. They become Codex MRLs when they have passed through the procedure and have been adopted by the Codex Alimentarius Commission.
MS	mass spectrometry or mass spectrometric detector (suffix to GC- or LC-)
MSD	mass-selective detection or detector
MS/MS	tandem mass spectrometry
NOAEL	no-observed-adverse-effect level
NMR	nuclear magnetic resonance
NPD	nitrogen/phosphorus detector
OECD	Organization for Economic Co-operation and Development
om	amount of organic matter in soil
PES	post extracted solids
PF	processing factor
PHI	pre-harvest interval
ppm	parts per million (used only with reference to the concentration of a pesticide in a diet, in all other contexts the terms mg/kg or mg/l are used)
P _{ow}	octanol–water partition coefficient
RAC	raw agricultural commodity
r.d.	relative density (formerly called specific gravity)
RfD	reference dose (usually in phrase “acute RfD”)
RSD	precision under repeatability conditions (measurements within one day or one run) expressed as relative standard deviation (= coefficient of variation)
SD	standard deviation
SPE	solid-phase extraction (may also describe a post-extraction clean-up process)

STMR	supervised trials median residue
STMR-P	supervised trials median residue in a processed commodity calculated by multiplying the STMR of the raw commodity by the corresponding processing factor
t	tonne (metric ton)
TAR	total applied (or administered) radioactivity
TLC	thin-layer chromatography
TRR	total radioactive residue
TMDI	theoretical maximum daily intake
TSD	thermionic specific detection or detector (equivalent to AFID, forerunners of NPD)
USDA	US Department of Agriculture
US FDA	US Food and Drug Administration
UV	ultraviolet (radiation)
W	the previous recommendation is withdrawn, or withdrawal of the existing Codex or draft MRL is recommended
WHO	World Health Organization

USE OF JMPR REPORTS AND EVALUATIONS BY REGISTRATION AUTHORITIES

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| 2 | Cotton specialists and research institutions in selected countries, 1976 (E) | 26 Sup. | Pesticide residues in food 1980 – Evaluations, 1981 (E) |
| 3 | Food legumes: distribution, adaptability and biology of yield, 1977 (E F S) | 27 | Small-scale cash crop farming in South Asia, 1981 (E) |
| 4 | Soybean production in the tropics, 1977 (C E F S) | 28 | Second expert consultation on environmental criteria for registration of pesticides, 1981 (E F S) |
| 4 Rev.1 | Soybean production in the tropics (first revision), 1982 (E) | 29 | Sesame: status and improvement, 1981 (E) |
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| 7 | Rodent pest biology and control – Bibliography 1970-74, 1977 (E) | 33 | Plant collecting and herbarium development, 1981 (E) |
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| 9 | Food legume crops: improvement and production, 1977 (E) | 35 | Date production and protection, 1982 (Ar E) |
| 10 | Pesticide residues in food, 1977 – Report, 1978 (E F S) | 36 | El cultivo y la utilización del tarwi – <i>Lupinus mutabilis</i> Sweet, 1982 (S) |
| 10 Rev. | Pesticide residues in food 1977 – Report, 1978 (E) | 37 | Pesticide residues in food 1981 – Report, 1982 (E F S) |
| 10 Sup. | Pesticide residues in food 1977 – Evaluations, 1978 (E) | 38 | Winged bean production in the tropics, 1982 (E) |
| 11 | Pesticide residues in food 1965-78 – Index and summary, 1978 (E F S) | 39 | Seeds, 1982 (E/F/S) |
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| 14 | Guidelines for integrated control of rice insect pests, 1979 (Ar C E F S) | 42 | Pesticide residues in food 1981 – Evaluations, 1982 (E) |
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| 18 | Guidelines for integrated control of maize pests, 1979 (C E) | 47 | The sago palm, 1983 (E F) |
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| 25 | <i>Prosopis tamarugo</i> : fodder tree for arid zones, 1981 (E F S) | 56 | Pesticide residues in food 1983 – Report, 1984 (E F S) |
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65	Amélioration de la culture irriguée du riz des petits fermiers, 1985 (F)	95	Rodent pests and their control in the Near East, 1989 (E)
66	Sesame and safflower: status and potentials, 1985 (E)	96	<i>Striga</i> – Improved management in Africa, 1989 (E)
67	Pesticide residues in food 1984 – Evaluations, 1985 (E)	97/1	Fodders for the Near East: alfalfa, 1989 (Ar E)
68	Pesticide residus in food 1985 – Report, 1986 (E F S)	97/2	Fodders for the Near East: annual medic pastures, 1989 (Ar E F)
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70	Breeding for durable resistance in perennial crops, 1986 (E)	99	Pesticide residues in food 1989 – Report, 1989 (E F S)
71	Technical guideline on seed potato micropropagation and multiplication, 1986 (E)	100	Pesticide residues in food 1989 – Evaluations – Part I: Residues, 1990 (E)
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85	Manual on the development and use of FAO specifications for plant protection products, 1987 (E** F S)	115	Olive pests and their control in the Near East, 1992 (E)
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