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PAPER

212

Pesticide residues in food 2011

Joint FAO/WHO Meeting on Pesticide Residues

EVALUATIONS 2011

PART I - RESIDUES

World Health Organization

Food and Agriculture Organization of the United Nations

Pesticide residues in food 2011

Evaluations
Part I - Residues

FAO
PLANT
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PAPER

212

Sponsored jointly by FAO and WHO

Joint meeting of the
FAO Panel of Experts on Pesticide Residues
in food and the Environment
and the
WHO Core Assessment Group
Geneva, Switzerland 20-29 September 2011

WORLD HEALTH ORGANIZATION
FOOD AND AGRICULTURE ORGANIZATION OF THE UNITED NATIONS
Rome, 2011

Monographs containing summaries or residue data and toxicological data considered at the 2011 JMPR, together with recommendations, are available upon request from FAO or WHO under the title:

Pesticide residues in food 2011

Evaluations

Part I: Residues

FAO Plant Protection Paper 212

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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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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.)

AChE	acetylcholinesterase
ACTH	adrenocorticotropic hormone
ADI	acceptable daily intake
ae	acid equivalent
ai	active ingredient
ALT	alanine aminotransferase
AMPA	aminomethylphosphonic acid
AP	alkaline phosphatase
AR	applied radioactivity
ARe	androgen receptor
ARfD	acute reference dose
asp gr fn	aspirated grain fraction
AST	aspartate aminotransferase
AU	Australia
BBCH	**B**iologischen Bundesanstalt, **B**undessortenamt und **CH**emische Industrie
BMD	benchmark dose
BMDL	lower limit on the benchmark dose
BROD	benzyloxyresorufin-*O*-dealkylase
bw	body weight
CAC	Codex Alimentarius Commission
CAR	constitutive androstane receptor
CAS	Chemical Abstracts Service
CCN	Codex classification number (for compounds or commodities)
CCPR	Codex Committee on Pesticide Residues
ChE	cholinesterase
C_{max}	maximum concentration
CXL	Codex MRL
CYP	cytochrome P450
DAP	days after planting
DAT	days after treatment

DCSA	3,6-dichlorosalicylic acid
DDT	dichlorodiphenyltrichloroethane
DM	dry matter
DM-PCA	3-trifluoromethyl-1H-pyrazole-4-carboxylic acid
DNA	deoxyribonucleic acid
DT_{50}	time required for 50% dissipation of the initial concentration
dw	dry weight
ECD	electron capture detector
EC_{50}	the concentration of agonist that elicits a response that is 50% of the possible maximum
EPO	early post-emergence
EPSPS	5-enolpyruvylshikimate-3-phosphate synthase
ER	estrogen receptor
EROD	ethoxyresorufin-*O*-deethylase
EtOAc	ethyl acetate
EU	European Union
F_0	parental generation
F_1	first filial generation
F_2	second filial generation
FAO	Food and Agriculture Organization of the United Nations
FPD	flame photometric detector
fw	fresh weight
GAP	good agricultural practice
GAT	glyphosate-N-acetyltransferase
GC	gas chromatography
GC-ECD	gas chromatography with electron capture detection
GC-FPD	gas chromatography with flame photometric detection
GC/MS	gas chromatography/mass spectrometry
GC/TSD	gas chromatography with thermionic sensitive detection
GD	gestation day
GEMS/Food	Global Environment Monitoring System – Food Contamination Monitoring and Assessment Programme
GLC	gas liquid chromatography
GLP	good laboratory practice
GPC	gel permeation chromatography
HPLC	high performance liquid chromatography
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
ISO	International Organization for Standardization
IUPAC	International Union of Pure and Applied Chemistry
JECFA	Joint FAO/WHO Expert Committee on Food Additives
JMPR	Joint FAO/WHO Meeting on Pesticide Residues
JMPS	Joint FAO/WHO Meeting on Pesticide Specifications
JP	Japan
LC	liquid chromatography
LC_{50}	median lethal concentration
LD_{50}	median lethal dose
LH	luteinizing hormone
LHR	luteinizing hormone receptor
LOAEC	lowest-observed-adverse-effect concentration
LOAEL	lowest-observed-adverse-effect level
LOD	limit of detection
LOQ	limit of quantification
LPO	late post-emergence
MFO	mixed-function oxidase
MG	methylguanidine
MOA	mode of action
MRL	maximum residue limit; maximum residue level
MS	mass spectrometry
MS/MS	tandem mass spectrometry
nAChR	nicotinic acetylcholine receptor
NOAEC	no-observed-adverse-effect concentration
NOAEL	no-observed-adverse-effect level
NOEL	no-observed-effect level
NPD	nitrogen phosphorous detector
NTE	neuropathy target esterase
OECD	Organisation for Economic Co-operation and Development
PAM	1-methyl-3-trifluoromethyl-1H-pyrazole-4-carboxamide
PBI	plant back interval
PCA	1-methyl-3-trifluoromethyl-1H-pyrazole-4-carboxylic acid

Pf	processing factor
PH	pre-harvest
PHI	pre-harvest interval
ppm	parts per million
PRE	pre-emergence
PROD	pentoxyresorufin-*O*-deethylase
PXR	pregnane X receptor
RAC	raw agricultural commodity
RSD	relative standard deviation
RTI	re-treatment interval
SC	suspension concentrate
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_3	triiodothyronine
T_4	thyroxine
T_{max}	time to reach maximum concentration
TAR	total administered radioactivity
TF	transfer factor
TLC	thin-layer chromatography
TRIS	tris(hydroxymethyl)aminomethane
TRR	total radioactive residues
UGT	uridine diphosphate glucuronosyltransferase
UK	United Kingdom
USA	United States of America
US/CAN	United States and Canada
US-FDA	USA – Food and Drug Administration
WG	wettable granule
WHO	World Health Organization

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INTRODUCTION

The Report of the Joint Meeting of the FAO Panel of Experts on Pesticide Residues in Food and the Environment and the WHO Core Assessment Group (JMPR), held in Geneva, 20–29 September 2011, contains a summary of the evaluations of residues in foods of the various pesticides considered, as well as information on the general principles followed by the Meeting (JMPR, 2011). The present document contains summaries of the residues data considered, together with the recommendations made.

The Evaluations are issued in two parts:

Part I: Residues (by FAO);

Part II: Toxicology (by WHO).

For those interested in both aspects of pesticide evaluation, both parts and the Report containing summaries of residues and toxicological considerations are available.

Some of the compounds considered at the Meeting were previously evaluated and reported on in earlier publications. In general, only new information is summarised in the relevant monographs but reference is made to previously published evaluations, which should also be consulted. In the case of older compounds which are re-evaluated as part of the periodic review programme of the CCPR, a review of all available data, including data which may have previously been submitted, is carried out. Compounds evaluated for the first time are indicated by a single asterisk and those evaluated in the CCPR periodic review programme by double asterisks in the Table of Contents.

Summaries of recommended MRLs, STMR and HR levels and assessments of dietary intake, are published as Annexes 1, 3 and 4 in the Report, and reference is made to this report.

The name of the compound appearing as the title of each monograph is followed by its Codex Classification Number in parentheses.

References to previous Reports and Evaluations of Joint Meetings are listed in Annex I.

Acknowledgements

The monographs in these Evaluations were prepared by the following participants in the 2011 JMPR, for the FAO Panel of Experts on Pesticide Residues in Food and the Environment:

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JMPR, 2011. Pesticide residues in Food – 2011. Report of the 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, Geneva, Switzerland, 20-29 September 2011. WHO and FAO, Rome, 2011.

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