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Pesticide residues in food 2012

Joint FAO/WHO Meeting on Pesticide Residues

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Food and Agriculture Organization of the United Nations

Pesticide residues in food 2012

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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
Rome, Italy, 11-20 September 2012

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ABBREVIATIONS

ADI	acceptable daily intake
ai	active ingredient
AR	applied radioactivity
ARfD	acute reference dose
asp gr fn	aspirated grain fraction
ATP	adenosine triphosphate
AU	Australia
AUC	area under the plasma concentration–time curve
BBCH	**B**iologischen Bundesanstalt, **B**undessortenamt und **CH**emische Industrie
bw	body weight
CAC	Codex Alimentarius Commission
CAS	Chemical Abstracts Service
CCN	Codex classification number (for compounds or commodities)
CCPA	4-chloro-2-carboxyphenoxyacetic acid
CCPR	Codex Committee on Pesticide Residues
C_{max}	maximum concentration
CPIA	chlorophenylisovaleric acid
CXL	Codex MRL
CYP	cytochrome P450
DAP	days after planting
DAT	days after treatment
DM	dry matter
DMA	dimethylamine
DNA	deoxyribonucleic acid
DT_{50}	time required for 50% dissipation of the initial concentration
dw	dry weight
ECD	electron capture detector
EHC	Environmental Health Criteria monograph
EHE	ethylhexyl ester
EPO	early post-emergence
EU	European Union
F_0	parental generation
F_1	first filial generation
FAO	Food and Agriculture Organization of the United Nations
fw	fresh weight

GAP	good agricultural practice
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/MSD	gas chromatography/mass selective detector
GC-NPD	gas chromatography coupled with nitrogen-phosphorus detector
GD	gestation day
GEMS/Food	Global Environment Monitoring System – Food Contamination Monitoring and Assessment Programme
GI	gastrointestinal
GLC	gas liquid chromatography
GLP	good laboratory practice
GPC	gel permeation chromatography
HMCPA	4-chloro-2-hydroxymethyl phenoxyacetic acid
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
JMPR	Joint FAO/WHO Meeting on Pesticide Residues
JP	Japan
LC	liquid chromatography
LC_{50}	median lethal concentration
LD_{50}	median lethal dose
LOAEL	lowest-observed-adverse-effect level
LOD	limit of detection
LOQ	limit of quantification
MOA	mode of action
MPA	2-methylphosphinico-acetic acid
MPB	4-methylphosphinico-butanoic acid
MPP	3-[hydroxy(methyl) phosphinoyl]propionic acid (= 3-methylphosphinico-propionic acid)

MRL	maximum residue limit
MS	mass spectrometry
MS/MS	tandem mass spectrometry
NAG	*N*-acetylglufosinate
ND	non-detect - below limit of detection
NOAEC	no-observed-adverse-effect concentration
NOAEL	no-observed-adverse-effect level
OECD	Organisation for Economic Co-operation and Development
PAG3	2-(2-hydroxymethylphenyl)-2-oxoacetic acid
PAM	1-methyl-3-trifluoromethyl-1H-pyrazole-4-carboxamide
PB	3-phenoxybenzoic
PBI	plant back interval
PCA	1-methyl-3-trifluoromethyl-1H-pyrazole-4-carboxylic acid; 4-chloroaniline
Pf	processing factor
PH	pre-harvest
PHI	pre-harvest interval
ppm	parts per million
PRE	pre-emergence
RAC	raw agricultural commodity
RSD	relative standard deviation
RTI	re-treatment interval
SC	suspension concentrate
SL	soluble liquid
SPE	solid phase extraction
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
TAR	total administered radioactivity
TF	transfer factor
TLC	thin-layer chromatography
TMPA	2,2,3,3-tetramethylcyclopropane carboxylic acid
TRR	total radioactive residues
TTC	threshold of toxicological concern
UK	United Kingdom
USA	United States of America
US/CAN	United States and Canada
USEPA	United States Environmental Protection Agency
US-FDA	USA – Food and Drug Administration

WG	wettable granule
WHO	World Health Organization
WP	wettable powder

USE OF JMPR REPORTS AND EVALUATIONS BY REGISTRATION AUTHORITIES

Most of the summaries and evaluations contained in this report are based on unpublished proprietary data submitted for use by JMPR in making its assessments. A registration authority should not grant a registration on the basis of an evaluation unless it has first received authorization for such use from the owner of the data submitted for the JMPR review or has received the data on which the summaries are based, either from the owner of the data or from a second party that has obtained permission from the owner of the data for this purpose.

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R, residue and analytical aspects; T, toxicological evaluation

* New compound

** Evaluated within the periodic review programme of the Codex Committee on Pesticide Residues

PESTICIDE RESIDUES IN FOOD

REPORT OF THE 2012 JOINT FAO/WHO MEETING OF EXPERTS

1. INTRODUCTION

A Joint Meeting of the FAO Panel of Experts on Pesticide Residues in Food and the Environment and the WHO Core Assessment Group (JMPR) was held at FAO Headquarters, Rome (Italy), from 11 to 20 September 2012. The Panel Members of FAO met in preparatory sessions on 6–10 September.

The Meeting was opened by Dr Gavin Wall, Director, OiC, Plant Production and Protection Division (AGP), FAO. On behalf of FAO and WHO, Dr Wall welcomed and thanked the participants for providing their expertise and for the significant time and effort put into such an important activity, noting that there were 40 participants from 17 countries. He also expressed gratitude to the respective national authorities, institutes and organizations that have allowed their experts to contribute to this important work on pesticide residues.

The long history and key role played by the JMPR in the establishment of global residues standards was highlighted by Dr Wall. In particular, the importance of the JMPR pesticide risk assessments and the provision of scientific advice in helping to ensure the supply of safe food to consumers and the facilitation of fair international trade. Activities closely aligned with a fundamental principle of the UN, i.e., that all people should have access to sufficient and safe food to meet their needs via an efficient and fair food trade system.

In this context Dr Wall referred to the zero hunger campaign, recently launched by the Secretary-General of the UN at the time of the Rio+20 event. He pointed out that eradication of hunger could not be achieved without consumers having access to safe, affordable food. He highlighted that as the hungry and the sick are more vulnerable to the impacts of food contaminants there was a broader need to ensure that safe food should go hand in hand with safe water and improved sanitation, further underlining the importance of the work undertaken by the JMPR.

The issue of JMPR resourcing and its importance were also commented upon by Dr Wall. He mentioned that the issue had recently been discussed by the Codex Alimentarius Commission with member countries acknowledging their responsibility to ensure JMPR was sufficiently funded to enable the efficient provision of high quality scientific advice continued in a sustainable and timely manner. To this end Dr Wall indicated that the CAC had established a working group to identify short and longer term solutions to the current resource constraints.

Dr Selma Doyran, Chief Secretary, Codex Alimentarius Commission Joint FAO/WHO Food Standards Programme, also addressed the Meeting. She commented on the importance of scientific advice and how this had been raised at a recent the WTO SPS committee meeting. She also thanked the participants for their commitment and hard work in undertaking the activities of the JMPR.

The Meeting was held in pursuance of recommendations made by previous Meetings and accepted by the governing bodies of FAO and WHO that studies should be undertaken jointly by experts to evaluate possible hazards to humans arising from the occurrence of residues of pesticides in foods. The reports of previous Joint Meetings (see Annex 5) contain information on acceptable daily intakes (ADIs), acute reference doses (ARfDs), MRLs and the general principles that have been used for evaluating pesticides. The supporting documents (residue and toxicological evaluations) contain detailed monographs on these pesticides and include evaluations of analytical methods.

During the Meeting, the FAO Panel of Experts was responsible for reviewing residue and analytical aspects of the pesticides under consideration, including data on their metabolism, fate in the environment and use patterns, and for estimating the maximum levels of residues that might occur as a result of use of the pesticides according to good agricultural practice (GAP). Maximum residue levels and supervised trials median residue (STMR) values were estimated for commodities of animal origin. The WHO Core Assessment Group was responsible for reviewing toxicological and related data in order to establish ADIs, and ARfDs, where necessary.

The Meeting evaluated 31 pesticides, including 7 new compounds and 7 compounds that were re-evaluated within the periodic review programme of the CCPR, for toxicity or residues, or both.

The Meeting allocated ADIs and ARfDs, estimated maximum residue levels and recommended them for use by the CCPR, and estimated STMR and highest residue levels as a basis for estimating dietary intake.

The Meeting also estimated the dietary intakes (both short-term and long-term) of the pesticides reviewed and, on this basis, performed a dietary risk assessment in relation to their ADIs or ARfDs. Cases in which ADIs or ARfDs may be exceeded were clearly indicated in order to facilitate the decision-making process of the CCPR. The rationale for methodologies for long- and short-term dietary risk assessment are described in detail in FAO Manual on the submission and evaluation of pesticide residue data for the estimation of MRLs in food and feed (2009).

The Meeting considered a number of current issues related to the risk assessment of chemicals, the evaluation of pesticide residues and the procedures used to recommend maximum residue levels.

1.1 DECLARATION OF INTERESTS

The Secretariat informed the Meeting that all experts participating in the 2012 JMPR had completed declaration-of-interest forms and that no conflicts had been identified.

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