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Pesticide residues in food 2014

Joint FAO/WHO Meeting on Pesticide Residues

EVALUATIONS 2014

PART I - RESIDUES

Pesticide residues in food 2014

Evaluations
Part I - Residues

FAO
PLANT
PRODUCTION
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PAPER

222

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FAO Panel of Experts on Pesticide Residues
in food and the Environment
and the
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ABBREVIATIONS

ADI	acceptable daily intake
ae	acid equivalent
ai	active ingredient
AR	applied radioactivity
ARfD	acute reference dose
asp gr fn	aspirated grain fraction
AU	Australia
BAM	2,6-dichlorobenzamide
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)
CCPR	Codex Committee on Pesticide Residues
CEC	Cation exchange capacity
*c*GAP	Critical GAP
CPCA	cyclopropane carboxylic acid
CXL	Codex MRL
DAFT	Days after first treatment
DAP	days after planting
DAT	days after treatment
DC	Dispersible concentrate
DM	dry matter
DT_{50}	time required for 50% dissipation of the initial concentration
dw	dry weight
2D-TLC	Two dimensional thin layer chromatography
ECD	electron capture detector
ETU	ethylene thiourea
EPO	early post-emergence
eq.	equivalent
EU	European Union
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/MS	gas chromatography/mass spectrometry
GC/MSD	gas chromatography/mass selective detector
GC-NPD	gas chromatography coupled with nitrogen-phosphorus detector
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
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
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
log P_{ow}	octanol-water partition coefficient
LOQ	limit of quantification
MTE	Mancozeb toxicity equivalents
MOA	mode of action
MRL	maximum residue limit
MS	mass spectrometry
MS/MS	tandem mass spectrometry
m/z	mass to charge ratio
ND	non-detect - below limit of detection
NMR	Nuclear magnetic resonance

OECD	Organisation for Economic Co-operation and Development
om	Organic matter in soil
OP	organophosphorus compound
PAI	Pure active ingredient
PAM	Pesticide Analytical Manual
PBI	plant back interval
Pf	processing factor
PH	pre-harvest
PHI	pre-harvest interval
ppm	parts per million
PRE	pre-emergence
r	correlation coefficient
r^2	coefficient of determination
RAC	raw agricultural commodity
RSD	relative standard deviation
RTI	re-treatment interval
SC	suspension concentrate
S_f	Scaling factor
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
SUA	Supply Utilisation Account
TAR	total administered radioactivity
TF	transfer factor
TGAI	Technical grade active ingredient
TLC	thin-layer chromatography
TRR	total radioactive residues
U	uniformly (labelled)
UK	United Kingdom
USA	United States of America
US/CAN	United States and Canada
USEPA	United States Environmental Protection Agency
UV-VIS	Absorption spectrometry in ultraviolet and visible part of the spectrum
%v/v	Percentage volume:volume
WG	wettable granule

WHO	World Health Organization
WP	wettable powder
w/w	Percentage weight:weight

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INTRODUCTION

A Joint Meeting of the Food and Agriculture Organization of the United Nations (FAO) Panel of Experts on Pesticide Residues in Food and the Environment and the World Health Organization (WHO) Core Assessment Group on Pesticide Residues (JMPR) was held at FAO Headquarters, Rome (Italy), from 16 to 25 September 2014. The FAO Panel Members met in preparatory sessions on 11–15 September.

The Meeting was opened by Dr Clayton Campanhola, Director, Plant Production and Protection Division, FAO. On behalf of FAO and WHO, Dr Campanhola welcomed and thanked the participants for providing their expertise and for the significant time and effort devoted to such an important activity. He also expressed his sincere gratitude to the respective national authorities, institutes and organizations that have allowed their experts to contribute to the important work of the JMPR.

Dr Campanhola said that as the scientific advisory body for the Codex Committee on Pesticide Residues, the JMPR plays a central role in the establishment of global pesticide residue standards. For more than 50 years, the JMPR has been operating with two main objectives: firstly, risk assessment of pesticide residues and secondly scientific advice on the acceptable levels of pesticide residues in food and feed. Dr Campanhola further acknowledged that the deliberations of the JMPR were recognized as being authoritative, technically sound and provided an invaluable contribution to the collective efforts to provide safe food for consumers and to facilitate international trade. The growing demand for safe food and that agricultural production be sustainable underline now more than ever the continued relevance of the objectives underlying the work of the JMPR

Given the FAO's goal of eradicating hunger Dr Campanhola observed that this could not be achieved without having safe food in the hands of consumers. And that it was essential that fair practices existed in food trade allowing all producers equitable access to markets. Consequently, the work of JMPR makes an important contribution to the global fight against hunger.

Dr Campanhola also acknowledged that the demand for JMPR evaluations, in support of Codex Maximum Residue Limits, reflected the importance accorded by member countries to the scientific assessments undertaken by the JMPR, and the growth in the international trade in agricultural products. Finally, Dr Campanhola addressed his best wishes to the Meeting on behalf of the two parent organizations.

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 acceptable daily intakes (ADIs) and acute reference doses (ARfDs), where necessary.

The Meeting evaluated 33 pesticides, including eight new compounds and three compounds that were re-evaluated within the periodic review programme of the Codex Committee on Pesticide Residues (CCPR), for toxicity or residues, or both.

The Meeting allocated ADIs and ARfDs, estimated maximum residue levels and recommended them for use by CCPR, and estimated STMR and highest residue (HR) 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 dietary risk assessments 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 CCPR. The rationale for methodologies for long- and short-term dietary risk assessment are described in detail in the FAO manual on the submission and evaluation of pesticide residue data for the estimation of maximum residue levels 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.

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The annual 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 was held in Rome, Italy, from 16 to 25 September 2014. The FAO Panel of Experts had met in preparatory sessions from 11 to 15 September 2014. 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 pesticide residues in foods. During the meeting the FAO Panel of Experts was responsible for reviewing pesticide use patterns (use of good agricultural practices), data on the chemistry and composition of the pesticides and methods of analysis for pesticide residues and for estimating the maximum residue levels that might occur as a result of the use of the pesticides according to good agricultural use practices. The WHO Core Assessment Group was responsible for reviewing toxicological and related data and for estimating, where possible and appropriate, acceptable daily intakes (ADIs) and acute reference doses (ARfDs) of the pesticides for humans. This report contains information on ADIs, ARfDs, maximum residue levels, and general principles for the evaluation of pesticides. The recommendations of the Joint Meeting, including further research and information, are proposed for use by Member governments of the respective agencies and other interested parties.

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