Appendix I

ABBREVIATIONS USED IN THE TEXT

ADI	acceptable daily intake
ai	active ingredient
ARfD	acute reference dose
bw	body weight
CAS	Chemical Abstracts Service
CAC	Codex Alimentarius Commission
CCN	Codex Classification Number (this may refer to classification number for compounds or commodities)
CCPR	Codex Committee on Pesticide Residues
CIPAC	Collaborative International Pesticides Analytical Council
CLI	Crop Life International (formerly GCPF)
cv	coefficient of variation
CXL	Codex Maximum Residue Limit (Codex MRL). See MRL.
EMDI	estimated maximum daily intake
EMRL	extraneous maximum residue limit
FAO	Food and Agriculture Organization of the United Nations
GAP	good agricultural practice(s)
GCPF	Global Crop Protection Federation (replaced by CLI)
GEMS/Food	Global Environment Monitoring System – Food Contamination Monitoring and Assessment Programme
GIFAP	Groupement International des Associations Nationales de Fabricants de Produits Agrochimiques (International Group of National Associations of Manufacturers of Agrochemical Products) (replaced by GCPF)
GLP	good laboratory practice
HPLC-MS-MS	high performance liquid chromatography with tandem mass spectrometric detection
HR	highest residue in the edible portion of the commodity found in the trials used to estimate a maximum residue level in the commodity
HR-P	residue in a processed commodity calculated by multiplying the HR of the raw agricultural commodity by the corresponding processing factor
IEDI	International estimated daily intake
IESTI	International estimate of short term intake
IUPAC	International Union of Pure and Applied Chemistry

ISO	International Standard Organization
ISO-E	International Standard Organization – English common name
JMPR	Joint FAO/WHO Meeting on Pesticide Residues (Joint Meeting of the FAO Panel of Experts on Pesticide Residues in Food and the Environment and the WHO Core Assessment Group)
LOQ	limit of quantification, limit of quantification (synonymous with LOD, limit of determination)
LP	large portion consumed (kg food/day) for IESTI calculations
MRL	Maximum Residue Limit
NEDI	national estimated daily intake
NOAEL	no-observed-adverse-effect level
OECD	Organization for Economic Cooperation and Development
PHI	pre-harvest interval
RAC	raw agricultural commodity
SPS	WTO Agreement on the Application of Sanitary and Phytosanitary Measures
STMR	supervised trials median residue
STMR-P	supervised trials median residue – processed commodity
TAR	total applied radioactivity (crops) or total administered radioactivity (livestock)
TMDI	theoretical maximum daily intake
TMRL	Temporary Maximum Residue Limit
TRR	Total radioactive residue (Note: the same abbreviation is sometimes used for :total recovered radioactivity in specified plant part or animal part)
U	Unit weight of the whole agricultural commodity, i.e., as defined for MRL compliance including inedible parts
U_e	Unit weight of the edible portion (kg) for IESTI calculations
USEPA	United States Environmental Protection Agency
UV	ultraviolet
υ	variability factor for IESTI calculations
WHO	World Health Organization of the United Nations
WTO	World Trade Organization

Appendix II

GLOSSARY OF TERMS

At the very early meetings some definitions were adopted by JMPR. A glossary of definitions accepted by successive JMPR Meetings was added as Appendix IV to the report of the 1969 Meeting (FAO/WHO Report, 1970a). Additions and amendments to the definitions have since been made at subsequent meetings. Below are the present definitions used by the JMPR and CAC with the explanatory notes added to the definitions. The reader is referred to the IUPAC recommended Glossary of Terms relating to Pesticides (Stephenson 2006[67]) for the definition of relevant terms not given in these Guidelines.

Acceptable daily intake (ADI)

The ADI of a chemical is the daily intake which, during an entire lifetime, appears to be without appreciable risk to the health of the consumer on the basis of all the known facts at the time of the evaluation of the chemical by the Joint FAO/WHO Meeting on Pesticide Residues. It is expressed in milligrams of the chemical per kilogram of body weight. (Codex Alimentarius, Vol. 2A)

Note. For additional information on ADIs relative to pesticide residues, refer to the Report of the 1975 Joint FAO/WHO Meeting on Pesticide Residues, FAO Plant Production and Protection Series No.1 or WHO Technical Report Series No. 592.

Acute reference dose (ARfD)

ARfD of a chemical is an estimate of the amount of a substance in food and/or drinking-water, normally expressed on a body-weight basis, which can be ingested in a period of 24 hours or less without appreciable health risk to the consumer on the basis of all known facts at the time of the evaluation. (JMPR 2002)

Note: This definition differs from that used previously with respect to the duration of intake. This change was made because consumption data are available on a daily basis and cannot be further divided into individual meals.

Accuracy (of measurement)

Closeness of agreement between the result of a measurement and the (conventional) true value of the measure[67].

Note 1: Use of the term *precision* for *accuracy* should be avoided.

Note 2: True value is an ideal concept and, in general, cannot be known exactly.

Application rate

Mass of *pesticide active ingredient* applied over a specific area or per unit volume of an environmental component (air, water, soil)[67].

Critical supporting studies

Critical supporting studies are metabolism, farm animal feeding, processing, analytical methods and freezer storage stability studies.

[67] Stephenson G.S., Ferris, I.G., Holland, P.T., and Nordberg, M., 2006, Glossary of terms related to pesticides (IUPAC Recommendations 2006), Pure & Appl. Chem. 78. 2075-2154.

Definition of residues (for compliance with MRLs)

The definition of a residue (for compliance with MRLs) is that combination of the pesticide and its metabolites, derivatives and related compounds to which the MRL applies. (JMPR Report 1995, 2.8.1.)

Explanatory not: The residue definition for compliance with MRLs depends on the results of metabolism and toxicology studies, supervised residue trials, analytical methods and its general suitability for monitoring compliance with GAP.

Definition of residues (for estimation of dietary intake)

The definition of a residue (for estimation of dietary intake) is that combination of the pesticide and its metabolites, impurities and degradation products to which the STMR applies.

Explanatory note: The residue definition for estimation of dietary intake depends on the results of metabolism and toxicology studies and its general suitability for estimating dietary intake of the residue for comparison with the ADI.

Derived edible products

For the purposes of Codex Alimentarius, the term "derived edible products" means food or edible substances isolated from primary food commodities or raw agricultural commodities not intended for human consumption as such, using physical, biological or chemical processes". (JMPR Report 1979, Annex 3)

Desirable information

Information desired for the continued evaluation of the compound. (JMPR Report 1986, 2.5)

Extraneous Maximum Residue Limit (EMRL)

The EMRL refers to a pesticide residue or a contaminant arising from environmental sources (including former agricultural uses) other than the use of the pesticide or contaminant substance directly or indirectly on the commodity. It is the maximum concentration of a pesticide residue that is recommended by the Codex Alimentarius Commission to be legally permitted or recognized as acceptable in or on a food, agricultural commodity or animal feed. The concentration is expressed in milligrams of pesticide residue or contaminant per kilogram of the commodity (Codex Alimentarius Vol. 2A).

Explanatory notes:

The term EMRL is synonymous with "Extraneous Residue Limit" (ERL) previously used by the JMPR.

Residues in food of animal origin arising from residues in animal feed derived from activities that are controllable by farming practices are covered by "maximum residue limits". The term "practical residue limit", which has led to much confusion, has been abandoned.

The definition of EMRL replaced the expressions "practical residue limit" and "unintentional residue", in existence since the 1967 JMPR.

Good Agricultural Practice

Good agricultural practice in the use of pesticides (GAP) includes the nationally authorized safe uses of pesticides under actual conditions necessary for effective pest control. It encompasses a range of levels of pesticide applications up to the highest authorized use, applied in a manner which leaves a residue which is the smallest amount practicable.

Authorized safe uses are determined at the national level and include nationally registered or recommended uses, which take into account public and occupational health and environmental safety considerations.

Actual conditions include any stage in the production, storage, transport, distribution of food commodities and animal feed. (CAC, 1995)

Guideline level

A Guideline Level is the maximum concentration of a pesticide residue that might occur after the official recommended or authorized use of a pesticide for which no acceptable daily intake or temporary acceptable daily intake is established and that need not be exceeded if good practices are followed. It is expressed in milligrams of the residue per kilogram of the food. (JMPR Report 1975, Annex 3)

Highest residue (HR)

The HR is the highest residue level (expressed as mg/kg) in a composite sample of the edible portion of a food commodity when a pesticide has been used according to maximum GAP conditions. The HR is estimated as the highest of the residue values (one from each trial) from supervised trials conducted according to maximum GAP conditions, and includes residue components defined by the JMPR for estimation of dietary intake.

Highest residue – processed (HR-P)

The HR-P is the highest residue in a processed commodity calculated by multiplying the HR of the raw agricultural commodity by the corresponding processing factor.

International estimated daily intake (IEDI)

The IEDI is a prediction of the long-term daily intake of a pesticide residue on the basis of the assumptions of average daily food consumption per person and median residues from supervised trials, allowing for residues in the edible portion of a commodity and including residue components defined by the JMPR for estimation of dietary intake. Changes in residue levels resulting from preparation, cooking, or commercial processing are included. When information is available, dietary intake of residues resulting from other sources should be included. The IEDI is expressed in milligrams of residue per person.

Reference: WHO. 1997. Guidelines for predicting dietary intake of pesticide residues (revised). Prepared by the Global Environment Monitoring System – Food Contamination Monitoring and Assessment Programme (GEMS/Food) in collaboration with Codex Committee on Pesticide Residues (WHO/FSF/FOS/97.7.

International estimated short-term intake (IESTI)

The IESTI is a prediction of the short-term intake of a pesticide residue on the basis of the assumptions of high daily food consumption per person and highest residues from supervised trials, allowing for residues in the edible portion of a commodity and including residue components defined by the JMPR for estimation of dietary intake. The IESTI is expressed in milligrams of residue per kg body weight.

Note: IESTI has been used as an acronym for “international estimated short-term intake” and “international estimate of short-term intake”. Both are intended to have the same meaning.

Limit of determination (LOD)

The LOD is the lowest concentration of a pesticide residue or contaminant that can be identified and quantitatively measured in a specified food, agricultural commodity or animal

feed with an acceptable degree of certainty by a regulatory method of analysis. (Codex Alimentarius, Vol. 2A)

Explanatory note: LOD has also been used as an abbreviation for "limit of detection," which may be confusing. JMPR has now adopted LOQ – see the following definition

Limit of quantification (LOQ)

The LOQ is the smallest concentration of the analyte that can be quantified. It is commonly defined as the minimum concentration of analyte in the test sample that can be determined with acceptable precision (repeatability) and accuracy under the stated conditions of the test.

Reference: Joint FAO/IAEA Expert Consultation on 'Practical Procedures to Validate Method Performance of Analysis of Pesticide and Veterinary Drug Residues, and Trace Organic Contaminants in Food' (Hungary, 8-11 Nov, 1999). Annex 5, Glossary of Terms. www.iaea.org/trc/pest-qa_val3.htm.

Explanatory note: 'Limit of quantification' and 'limit of quantitation' are used synonymously and are abbreviated to LOQ. The FAO Panel estimates the LOQ of an analytical method for residues in specified substrates as being the lowest level where satisfactory recoveries were achieved. JMPR has used LOD (limit of determination) in the past with the same meaning as LOQ.

Maximum residue level

The maximum residue level is estimated by the JMPR as the maximum concentration of residues (expressed as mg/kg) which may occur in a food or feed commodity following Good Agricultural Practices. The estimated maximum residue level is considered by the JMPR to be suitable for establishing Codex MRLs.

Maximum Residue Limit (MRL)

The MRL is the maximum concentration of a pesticide residue (expressed as mg/kg), recommended by the Codex Alimentarius Commission to be legally permitted in or on food commodities and animal feeds. MRLs are based on GAP data and foods derived from commodities that comply with the respective MRLs are intended to be toxicologically acceptable. (Codex Alimentarius Vol. 2A)

Codex MRLs, which are primarily intended to apply in international trade, are derived from estimations made by the JMPR following:

a) a toxicological assessment of the pesticide and its residue; and

b) a review of residue data from supervised trials and supervised uses including those reflecting national good agricultural practices. Data from supervised trials conducted at the highest nationally recommended, authorized or registered uses are included in the review. In order to accommodate variations in national pest control requirements, Codex MRLs take into account the higher levels shown to arise in such supervised trials, which are considered to represent effective pest control practices.

Consideration of the various dietary residue estimates and determinations both at the national and international level in comparison with the ADI, should indicate that foods complying with Codex MRLs are safe for human consumption.

Explanatory note: The MRL applies to the product when first offered in commerce, unless otherwise indicated. For commodities entering international trade the MRL is applicable at the point of entry into a country or as soon as practicable thereafter and, in any event, before processing.

Multi-ingredient manufactured food

For the purposes of Codex Alimentarius, the term "multi-ingredient manufactured food" means a "processed food" consisting of more than one major ingredient. (JMPR Report 1979, Annex 3)

Pesticide

Pesticide means any substance intended for preventing, destroying, attracting, repelling, or controlling any pest including unwanted species of plants or animals during the production, storage, transport, distribution and processing of food, agricultural commodities or animal feeds, or which may be administered to animals for the control of ectoparasites. The term includes substances intended for use as a plant-growth regulator, defoliant, desiccant, fruit-thinning agent, or sprouting inhibitor and substances applied to crops either before or after harvest to protect the commodity from deterioration during storage and transport. The term normally excludes fertilizers, plant and animal nutrients, food additives and animal drugs. (CAC, 1995)

Pesticide residue

A pesticide residue is any specified substance in food, agricultural commodities, or animal feed resulting from the use of a pesticide. The term includes any derivatives of a pesticide, such as conversion products, metabolites, reaction products, and impurities considered to be of toxicological significance (Codex Procedural Manual 18th.ed).

Explanatory note: The term "pesticide residue" includes residues from unknown sources, i.e., background residues, as well as those from known uses of the chemical in question.

Adjuvants are not included in the definition of residues.

Primary feed commodity

For the purpose of the Codex Alimentarius the term "primary feed commodity" means the product in or nearly in its natural state intended for sale to:

a) the stock farmer as feed which is used without further processing for livestock animals or after silaging or similar farm processes;

b) the animal feed industry as a raw material for preparing compounded feeds.

Reference: FAO/WHO. 1993. Codex Classification of Foods and Animal Feeds in Codex Alimentarius, 2nd ed., Volume 2. Pesticide Residues, Section 2. Joint FAO/WHO Food Standard Programme. FAO, Rome.

Primary food commodity

For the purposes of the Codex Alimentarius, the term "primary food commodity" means the product in or nearly in its natural state intended for processing into food for sale to the consumer or as a food without further processing. It includes irradiated primary food commodities and products after removal of certain parts of the plant or parts of animal tissue." (JMPR Report 1979, Annex 3)

Processing factor

The processing factor for a specified pesticide residue, commodity and food process is the residue level in the processed product divided by the residue level in the starting commodity, usually a raw agricultural commodity.

$$\text{Processing factor} = \frac{\text{residue level [mg/kg] in processed product}}{\text{residue level [mg/kg] in RAC}}$$

Explanatory note: Alternative terms sometimes used for processing factor are; "concentration factor" when residue levels increase, and "reduction factor" (inverse of processing factor) when residue levels decrease.

Processed food - general definition

For the purposes of the Codex Alimentarius, the term "processed food" means the product, resulting from the application of physical, chemical or biological processes to a "primary food commodity" intended for direct sale to the consumer, for direct use as an ingredient in the manufacture of food or for further processing. "Primary food commodities" treated with ionizing radiation, washed, sorted or submitted to similar treatment are not considered to be '"processed foods" (JMPR Report 1979, Annex 3)

Provisional tolerable daily intake

A value based on toxicological data. It represents tolerable human intake of a former agricultural pesticide that may occur as a contaminant in food, drinking water and the environment. (JMPR Report 1994, 2.3)

Explanatory note: The term "tolerable" rather than "acceptable" is used to signify permissibility rather than acceptability of the intake of environmental contaminants unavoidably associated with the consumption of otherwise wholesome food. Use of the term "provisional" expresses the fact that reliable data on the consequences of human exposure to these pesticides are lacking and that the submission from any source of relevant safety data is encouraged.

Regulatory method of analysis

A regulatory method of analysis is a method suitable for the determination of a pesticide residue in connexion with the enforcement of legislation" (JMPR Report 1975, Annex 3).

Explanatory note: For this purpose, it is often necessary to identify the nature of the residue as well as to determine its concentration. Subject to any expression of requirements in the particular legislation, the accuracy, the precision and limit of determination of a regulatory method need to be sufficient only to demonstrate clearly whether or not a Maximum Residue Limit has been exceeded. Usually regulatory methods are not specified in pesticide residues legislation, and at any given time there may be a number of methods suitable for a particular purpose.

Required information

Information required to estimate maximum residue levels or confirm temporary estimates. (JMPR Report 1986, 2.5)

Explanatory note: Results of further work required should be made available not later than the specified date, after which the compound will be re-evaluated. The re-evaluation may be carried out at an earlier Meeting if relevant information should become available. Each recommended TMRL will be directly related to an item of required information (JMPR Report 1992, 2.8).

Secondary food commodity

For the purposes of Codex Alimentarius, the term "secondary food commodity" means a "primary food commodity" which has undergone simple processing, such as removal of certain portions, drying, husking and comminution, which do not basically alter the

composition or identity of the product. Secondary food commodities may be processed further or may be used as ingredients in the manufacture of food or may be sold directly to the consumer. (JMPR Report 1979, Annex 3)

Single-ingredient manufactured food (JMPR Report 1979, Annex 3)

For the purposes of Codex Alimentarius, the term "single-ingredient manufactured food" means a "processed food" which consists of one identifiable food ingredient with or without packing medium or with or without minor ingredients, such as flavouring agents, spices and condiments, and which is normally pre-packaged and ready for consumption with or without cooking.

Supervised trials (for estimating maximum residue levels)

Supervised trials for estimating maximum residue levels are scientific studies in which pesticides are applied to crops or animals according to specified conditions intended to reflect commercial practice after which harvested crops or tissues of slaughtered animals are analysed for pesticide residues. Usually specified conditions are those which approximate existing or proposed GAP.

Supervised trials median residue (STMR)

The STMR is the expected residue level (expressed as mg/kg) in the edible portion of a food commodity when a pesticide has been used according to maximum GAP conditions. The STMR is estimated as the median of the residue values (one from each trial) from supervised trials conducted according to maximum GAP conditions.

Supervised trials median residue – processed (STMR-P) (new definition)

The STMR-P is the expected residue in a processed commodity calculated by multiplying the STMR of the raw agricultural commodity by the corresponding processing factor.

Temporary MRL (TMRL) or Temporary EMRL (TEMRL) (Codex Alimentarius Vol. 2A)

A TMRL or a TEMRL is an MRL or EMRL established for a specified, limited period and is recommended under either of the following conditions:

1. Where a temporary acceptable daily intake has been estimated by the Joint FAO/WHO Meeting on Pesticide residues for the pesticide or contaminant of concern; or

2. Where, although an acceptable daily intake has been estimated, the good agricultural practice is not sufficiently known or residue data are inadequate for proposing an MRL or ERL by the Joint FAO/WHO Meeting on Pesticide Residues.

Note. TMRLs and TEMRLs are not to be advanced further than Step 7 of the Codex Procedure.

The 1992 JMPR gave the following definition (Report, section 2.8):

A temporary maximum residue limit is a maximum residue limit for a specified, limited period, which is clearly related to required information.

Comments

The "temporary maximum residue limit" is a successor of the "temporary tolerance" introduced by the 1966 JMPR, which was changed to "temporary maximum residue limit" in 1975.

At the 1988 JMPR the decision was taken not to establish Temporary Acceptable Daily Intakes any longer for new and periodic review compounds.

According to the Report of 1992 JMPR, there is still a possibility that TMRLs may be recommended when the information lacking on some residue aspects is unlikely to affect the validity of an estimated maximum residue level and would be available shortly. Each recommended TMRL will be directly related to an item of required information.

See also Chapter **6** section 14.1, "Recommendation of temporary MRLs."

Appendix III

CIPAC CODES FOR PESTICIDE FORMULATIONS

AB	Grain bait
AE	Aerosol dispenser
AL	Other liquids to be applied undiluted
AP	Other powders to be applied undiluted
BB	Block bait
BR	Briquette
CB	Bait concentrate
CF	Capsule Suspension for Seed Treatment
CG	Encapsulated granule
CL	Contact liquid or gel
CP	Contact powder
CS	Capsule suspension
DC	Dispersible concentrate
DP	Dustable powder
DS	Powder for dry seed treatment
DT	Tablet for direct application
EC	Emulsifiable concentrate
ED	Electrochargeable liquid
EG	Emulsifiable Granule
EO	Emulsion, water in oil
EP	Emulsifiable powder
ES	Emulsion for seed treatment
EW	Emulsion, oil in water
FD	Smoke tin
FG	Fine granule
FK	Smoke candle
FP	Smoke cartridge
FR	Smoke rodlet
FS	Flowable concentrate for seed treatment
FT	Smoke tablet
FU	Smoke generator
FW	Smoke pellet
GA	Gas
GB	Granular bait
GE	Gas generating product
GF	Gel for Seed Treatment
GG	Macrogranule
GL	Emulsifiable gel
GP	Flo-dust
GR	Granule
GS	Grease
GW	Water soluble gel
HN	Hot fogging concentrate
KK	Combi-pack solid/liquid
KP	Combi-pack solid/solid
LA	Lacquer
LN	Long-lasting insecticidal net
LS	Solution for seed treatment
LV	Liquid vapouriser
MC	Mosquito coil
ME	Micro-emulsion
MG	Microgranule
MV	Vapourizing mats
OD	Oil dispersion
OF	Oil miscible flowable concentrate (oil miscible suspension)
OL	Oil miscible liquid
OP	Oil dispersible powder
PA	Paste
PB	Plate bait
PC	Gel concentrate or paste concentrate
PO	Pour-on
PR	Plant rodlet
PS	Seed coated with a pesticide
RB	Bait (ready to use)
SA	Spot-on
SB	Scrap bait
SC	Suspension concentrate (= flowable concentrate)
SD	Suspension concentrate for direct application
SE	Suspo-emulsion
SG	Water soluble granule
SL	Soluble concentrate
SO	Spreading oil
SP	Water soluble powder
SS	Water soluble powder for seed treatment
ST	Water soluble tablet
SU	Ultra-low volume (ULV) suspension
TB	Tablet
TC	Technical material
TK	Technical concentrate
TP	Tracking powder
UL	Ultra-low volume (ULV) liquid
VP	Vapour releasing product
WG	Water dispersible granule
WP	Wettable powder
WS	Water dispersible powder for slurry seed treatment
WT	Water dispersible tablet
XX	Others
ZC	Mixed formulation of CS and SC

KL	Combi-pack liquid/liquid	ZE	Mixed formulation of CS and SE
KN	Cold fogging concentrate	ZW	Mixed formulation of CS and EW

Appendix IV

MRL PERIODIC REVIEW PROCEDURE BY CCPR
(ALINORM 97/24 APPENDIX III)

CODEX COMMITTEE ON PESTICIDE RESIDUES
MRL PERIODIC REVIEW PROCEDURE

Periodic review may also be referred to as periodic re-evaluation. The two terms are synonymous. "Periodic review programme" and "periodic review procedure" also mean the same thing.

The periodic review programme was initiated to ensure that the data supporting Codex MRLs met contemporary standards. A complete data submission is requested for old compounds. Recommendations to confirm, amend or delete existing MRLs or to introduce new MRLs arise from the new data. The periodic review procedure consists of two distinct phases as described below:

1. PHASE I

IDENTIFY PERIODIC REVIEW CHEMICALS AND SOLICIT DATA COMMITMENTS

Identify candidate chemicals for re-evaluation

CCPR will submit a proposal to the CAC each year, as ongoing work, to re-establish the Electronic Working Group (EWG) on Priorities. The EWG on Priorities is tasked with preparing a draft 'Codex Priority List of Pesticides for JMPR evaluation' for the consideration of CCPR, i.e., proposals for evaluation by JMPR are finalized by the Committee for adoption by the CAC in the same year.

When prioritizing chemicals for periodic re-evaluation by the JMPR, the Committee will consider the following criteria:

- If the intake and/or toxicity profile indicates, through scientific and/or technical data, some level of public health concern;
- Chemicals that have not been reviewed toxicologically for more than 15 years and/or not having a significant review of maximum residue limits for 15 years;
- The year the chemical is listed in the list for Candidate Chemicals for Periodic Re-evaluation – Not Yet Scheduled;
- The date that data will be submitted;
- Whether the CCPR has been advised by a national government that the chemical has been responsible for trade disruption;
- If there is a closely related chemical that is a candidate for periodic re-evaluation that can be evaluated concurrently;
- The availability of current labels arising from recent national re-evaluations.
- The nature of the data to be submitted, and the reason for its submission; for example, a request from CCPR.

Notify data owners or other parties of candidate list

Within two months of the CAC meeting, the Chair of the EWG will issue a broadcast email to all CCPR member countries and observers proposing additions to the previously prepared periodic re-evaluation schedule (noting the 15 year rule).

Each CCPR meeting will have finalised the Priority Lists of Pesticides for the following year's JMPR evaluations. Therefore, nominations and comments on the Codex Priority Lists of Pesticides will apply to subsequent years to the forthcoming CCPR meeting.

The due date for nominations and comments on the draft priority list of compounds will be 30 November. The Chair of the EWG on Priorities then prepares a draft CCPR agenda paper 'Establishment of Codex Priority Lists of Pesticides' by 21 December of that year.

The draft agenda paper will then be submitted to the Codex Secretariat for circulation to all member countries and observers as a circular letter on 1 January with comments due on 1 March.

The Chair of the EWG on Priorities will finalise the CCPR agenda paper which includes the Codex Priority Lists of Pesticides and submit to Codex Secretariat. The Codex Priority Lists of Pesticides will comprise four appendices: Appendix 1 – Codex Priority List of Pesticides, Appendix 2 - Periodic Re-evaluations, Appendix 3: Chemical-commodity combinations for which specific GAP is no longer supported and Appendix 4: Chemicals with extraneous MRLs and recent deletions.

Invite commitment to support continued (or new) codex maximum residue limits (CXLs)

Following nomination the data owners (or other interested parties) of the chemicals for periodic review, governments and international organizations inquire of data owners their willingness to provide data for that review and also to advise them of the implications should support not be forthcoming.

The invitation for a commitment will request a written response within six months of notification to be provided to:

- Chairman, CCPR
- Chairman, Electronic Working Group on Priorities
- JMPR Secretariats
- the requester (government or international organization representative). Names, titles and addresses will be provided.

The invitation will request that the following information be provided in the response:

- A list of all commodities for which interested parties are willing to support CXLs
- A brief summary of all current Good Agricultural Practice (GAP) which they are willing to provide and which is pertinent to the residue data they are willing to provide, e.g., commodities and countries for which detailed GAP summaries and representative labels can be provided,
- A list of all chemistry (residue, metabolism, animal transfer, processing, analytical sample storage stability and analytical methods) and toxicology studies and other data that they are willing to provide (regardless of whether previously provided)

and the complete data package submissions to the JMPR. Comments on the status of registrations for the chemicals at the national level are encouraged. Data for which a submission is committed should be identified in the response by study or report title and number, author and date.

Note: Data should be submitted in both paper and electronic form.

Repeat the notification and invitation

By means of a Codex Circular Letter to accompany the report of the Meeting the Secretariat will repeat the notification and request. On receipt of the request by the Circular Letter, governments and international organizations will immediately repeat their notification and invitation to identified interested parties who may not have been represented at the CCPR (they would not have received the report of the Meeting or the accompanying Circular Letter). Interested parties need only respond to one of the requests, but should copy addressees listed under "Invite commitment to support continued (or new) codex maximum residue limits".

2. PHASE II

STATUS REPORT ON DATA COMMITMENTS AND CCPR FOLLOW-UP

Status report on data commitments

The Electronic Working Group on Priorities provides a report to the CCPR on the status of commitments received to provide data for each compound previously identified. This information will be used to schedule JMPR reviews or to make other recommendations such as withdrawal of CXLs.

Response to data commitments

If there is no commitment to provide and identify or develop data to support current CXLs, the CXL(s) will be recommended by the CCPR for withdrawal by the next session of the Codex Commission.

If a commitment is made to provide and identify or develop data to support current CXLs, the MRL(s) are scheduled for JMPR review. The JMPR review will result in one of the following scenarios:

(i) Sufficient data are submitted to confirm the CXL and it remains in place.

(ii) Sufficient data are submitted to support a new proposed MRL, it enters the process at Step 3 and the existing CXL is deleted automatically after no more than 4 years.

If insufficient data have been submitted to support a new MRL or to confirm the existing CXL, data submitters are so advised by written notification from the FAO Joint Secretary or by issuance of the JMPR Report.

On being advised of the data inadequacy, data submitters may by the next CCPR Meeting, provide to the FAO and CCPR Secretaries a written commitment to generate and submit a complete dossier of required data for review within 4 years. The CXL is maintained for no more than 4 years following advice of data inadequacy (by direct notification or by issuance of the JMPR Report). The 4-year period may be extended by the CCPR only to the extent necessary for the JMPR to schedule and complete review of the available new data.

The new data are scheduled for the second JMPR review and the first part of the PHASE II "if a commitment is made" procedure is repeated:

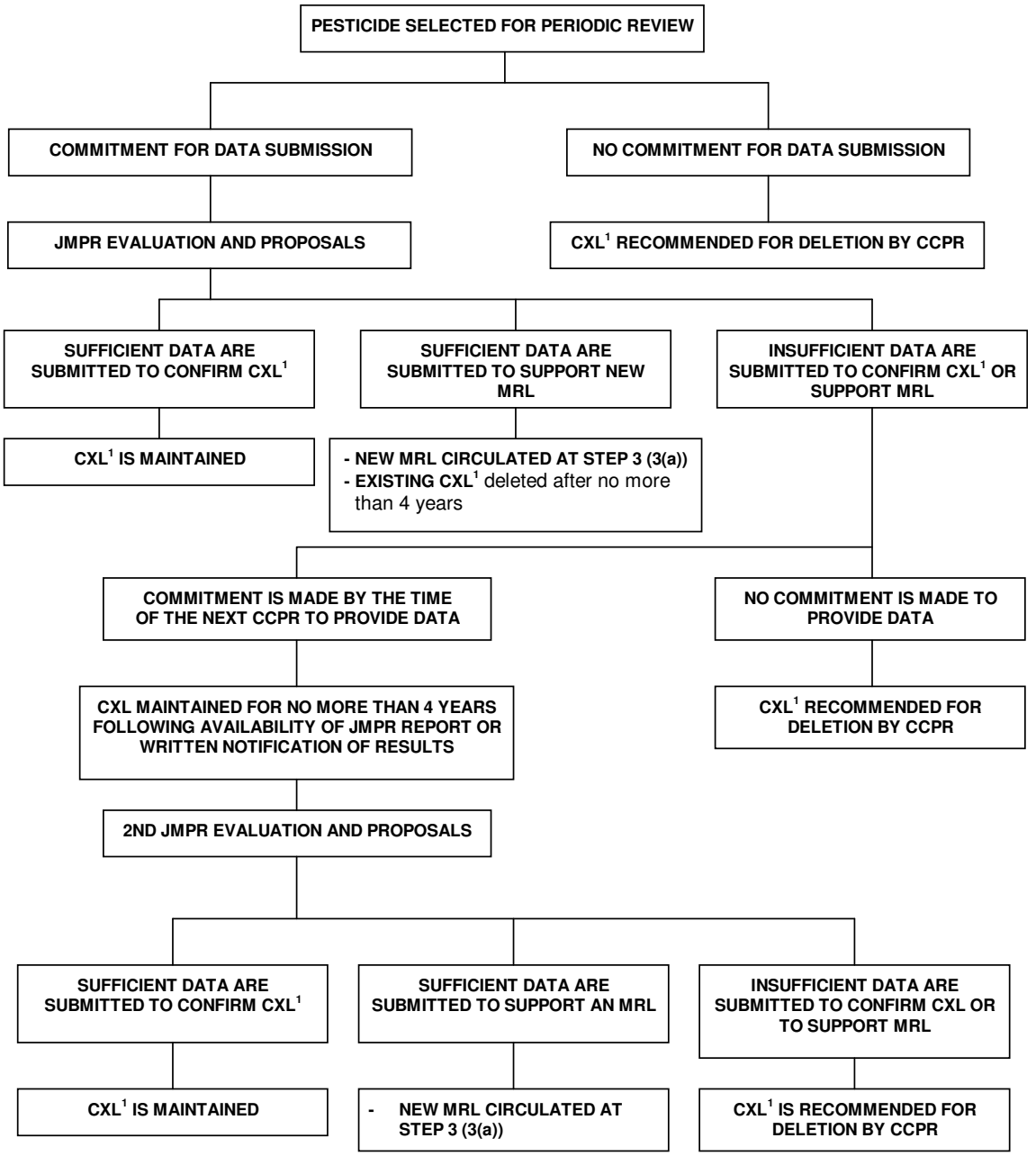
Sufficient data are submitted to confirm the CXL and it remains in place.

Sufficient data are submitted to support a new proposed MRL and it enters the process at Step 3. The CXL is automatically deleted no more than 4 years after the new proposal enters the process.

(iii) Insufficient data are submitted to confirm the CXL or support a proposed MRL and the CCPR recommends deletion of the CXL.

(iv) If the committed data are not submitted, or if the data submitted for the initial periodic review are insufficient and no commitment is made by the next CCPR Meeting to generate new data, the CCPR recommends deletion of the CXL.

SUMMARY OF PERIODIC REVIEW PROCEDURE FOR CODEX MRLs



[1]Codex MRL adopted by the Codex Alimentarius Commission. The Codex Alimentarius Commission may decide to delete certain Codex MRLs based on the recommendations made to it by the Codex Committee on Pesticide Residues.

Appendix V

RECOMMENDED SAMPLING METHODS FOR SUPERVISED FIELD TRIALS

CONTENTS

1. GENERAL RECOMMENDATIONS

The best information about the residue behaviour of the pesticide under study would be obtained by the analysis of the entire yield of a plot. Since this is not practicable, representative samples have to be taken. Careful attention to the details of sampling is essential if worthwhile samples are to be obtained. Valid analytical results can only be obtained if the samples have been properly taken, despatched and stored before analysis.

In selecting sampling points and the sampling methods, all factors that control the residue distributions over the entire experimental plot must be considered. The best approach for any given plot can only be determined by a sufficiently trained person who is capable of recognising the importance and usefulness of the residue data sought, and who can interpret the results.

The samples must be representative to enable the analytical result to be applied to the entire experimental unit. The greater the number of plants sampled in a field plot, the more representative the sample will be. However, economics and the practical problems involved in handling large samples affect the magnitude of the sampling programme. The sample size suggested is the minimum that experience has shown is needed to give a representative, valid sample. The sizes are not usually dictated by the analytical method, which can often determine minute amounts of pesticides in small sample amounts.

Method of sampling

Generally, the selection of the portions that make up the field sample should be made depending on the circumstances:

- randomly, e.g., by the use of random numbers
- systematically, .e.g., in the case of field crops on a diagonal (“X” or an “S” course)
- stratified random sampling from predetermined sampling-positions, e.g., in the case of tree fruits inner part and outer part of the canopy, i.e., fruits , directly exposed to spray and those covered by foliage, proportionally to the abundance of fruits in each strata; within one strata each fruit has an equal chance of being taken.

Points to be considered are:

- Avoid taking samples at the beginning or at the extreme ends of plots (start and finish of spraying).
- Take and bag the required weight or number of samples in the field and do not subsample until the samples are in a clean field laboratory or in the analytical laboratory.
- Sample all parts of the crop that can be consumed by humans or livestock.
- Sample the parts of the crop that normally constitute the commercial commodity as described in Appendix **V**.
- Where appropriate, consider commercial harvesting practice which reflects normal "Good Agricultural Practice" (see also this appendix section "Contamination").

Replication

Under normal circumstances one sample per plot is sufficient. Additional samples may be taken and held for security reasons, i.e., to guard against the possibility that a sample is lost or destroyed during transport, to ensure the investment in the trial is not wasted.

Sample integrity should be maintained throughout the procedure.

Sample handling

- Take care not to remove surface residues during handling, packing or preparation.
- Avoid any damage to or deterioration of the sample which might affect residue levels.
- To provide a representative sample of the raw commodity, adhering soil may have to be removed from some crops, such as root crops. This may be done by brushing and, if necessary, gentle rinsing with cold running water (see also this Appendix **V**, section "Bulb vegetables, root vegetables, tuber vegetables").
- Sample control plots before treated plots (see also this appendix sections "Contamination" and "Control samples").

2. CONTAMINATION

It is vital to avoid any contamination with the pesticide under study or with other chemicals during sampling, transportation or subsequent operations. Special attention should, therefore, be paid to the following:

- Ensure that sampling tools and bags are clean. To avoid contamination use new bags and containers of suitable size and adequate strength. The bags or containers should be made of materials which will not interfere with the analysis.
- Avoid contamination of the sample by hands and clothes which may have been in contact with pesticides.
- Do not allow the samples to come into contact with containers or equipment (including vehicles) that have been used for transporting or storing pesticides.
- Avoid sampling at the plot borders because the residue deposit may not be representative.

- Take special care to avoid contamination when commercial mechanical harvesting practices are used (see also this appendix sections "Cereals", "Seeds" and "Herbs and Spices: tea leaves: hops; beer").
- Avoid cross-contamination of crop and soil samples.
- Sampling should proceed from the control to the lowest treatment and so on to the highest treatment.

3. CONTROL SAMPLES

Control samples are in every way as important as samples from test plots. The quality of control samples should be similar to that of the test samples, e.g., maturity of fruit, type of foliage, etc.

Always take control samples. In decline studies of up to 14 days' duration, control samples from the start and from the end of the study may suffice (see also this appendix section "Sampling in decline studies.").

4. SAMPLING IN DECLINE STUDIES AND AT NORMAL HARVEST TIME

Representative and valid sampling protocols might be different for decline studies and residue trials at normal harvest time.

Sampling in decline studies

The first sampling may take place on the day of application. These samples have to be taken immediately after application, or in the case of spray application, immediately after the spray has dried (approximately two hours).

- Take great care to avoid contamination.
- Take samples so as to be representative of the average size or weight of crop on the plot.

Sampling at normal harvest time

- Take samples so as to be representative of typical harvesting practice.
- Avoid taking diseased or undersized crop parts or commodities at a stage when they would not normally be harvested.

Detailed sampling procedures

The following recommendations refer to the sampling of mature crops at normal harvest time, unless otherwise stated. The classification of the crops is contained in Section 2 of Codex Alimentarius Volume 2A[68].

Fruits and tree nuts

- Circle each tree or bush and select fruit from all segments of the tree or plant, high and low, exposed and protected by foliage. For small fruits grown in a row, select fruit from both sides, but not within 1 metre of the end of the row.

[68] FAO/WHO. 1993. Codex Classification of Foods and Animal Feeds in Codex Alimentarius, 2nd ed., Volume 2. Pesticide Residues, Section 2. Joint FAO/WHO Food Standards Programme. FAO, Rome.

- Select the quantity of the fruit according to its density on the tree or plant, i.e., take more from the heavily-laden parts.
- Take both large and small fruits where appropriate, but not so small or damaged that they could not be sold (except when taking immature samples for a residue decline study).
- Take samples of fruit juices, cider and wine in a manner reflecting common practice.

Table V.1 Sampling of fruits

Commodity	Codex Code No.	Quantity, method of collection
Citrus fruits e.g., orange, lemon, mandarin, pomelo, grapefruit, clementine, tangelo, tangerine	Group 001	12 fruits from several places on 4 individual trees. (If this produces a sample weight of less than 2 kg, more fruit should be taken to yield a 2 kg sample)
Pome fruits e.g., apples, pears, quinces, medlars	Group 002	
Large stone fruit e.g., apricots, nectarines, peaches, plums	Group 003	
Miscellaneous fruit e.g., avocados, guavas, mangoes, papayas, pomegranates, persimmons, kiwifruit, litchi	Group 006	
Small stone fruit e.g., cherries	Group 003	1 kg from several places on 4 trees
Grapes	FB 0269	12 bunches, or parts of 12 bunches, from separate vines to give at least 1 kg
Currants, raspberries and other small berries	Group 004	1 kg from 12 separate areas or bushes
Strawberries, Gooseberries	FB 0275, FB 0276 FB 0268	1 kg from 12 separate areas or bushes
Miscellaneous small fruits e.g., olives, dates, figs	Group 005	1 kg from several places on 4 trees
Pineapples	Fl 0353	12 fruits
Bananas	Fl 0327	24 fruits. Take two fingers each from top, middle and lowest hand of four harvestable bunches
Tree nuts e.g., walnuts, chestnuts, almonds	Group 022	1 kg
Coconut	TN 0655	12 nuts
Fruit juices, wine, cider	Group 070	1 litre

Vegetables

Bulb vegetables, root vegetables, tuber vegetables:

- Take samples from all over the plot, excluding 1 metre at the edges of the plot and the ends of the rows. The number of sampling points depends on the sample size of the crop (see below).
- To provide a representative sample of the raw commodity, adhering soil may have to be removed. This may be done by brushing and, if necessary, gentle rinsing with cold running water.
- Trim off tops according to local agricultural practice. Details of any trimming should be recorded. Where the tops are not used as animal feed (carrots, potatoes) they should be discarded; otherwise, e.g., turnips, beets, they should be bagged separately.

Table V.2 Sampling of bulb, root and tuber vegetables

Commodity	Codex Code No.	Quantity, method of collection
Fodder beets, Sugar beets	AM 1051 VR 0596	12 plants
Potatoes	VR 0589	12 tubers (the sample should weigh at least 2 kg - where necessary, take a larger number to produce a 2 kg sample)
Other root crops e.g., carrots, red beet, Jerusalem artichoke, sweet potato, celeriac, turnip, swede, parsnip, horseradish, salsify, chicory, radish, scorzonera	Group 016	12 roots (the sample should weigh at least 2 kg - where necessary, take a larger number to produce a 2 kg sample)
Leeks, Bulb onions	VA 0384 VA 0385	12 plants
Spring onions	VA 0389	24 plants (the sample should weigh at least 2 kg - where necessary, take a larger number to produce a 2 kg sample)
Garlic, Shallots	VA 0381 VA 0388	12 bulbs from 12 plants.(the sample should weigh at least 2 kg - where necessary, take a larger number to produce a 2 kg sample)

Brassica vegetables, leafy vegetables, stalk and stem vegetables, legume vegetables and fruiting vegetables:

- Take the sample from all parts of the plot, leaving 1 metre at the edges and ends of rows. The number of sampling points depends on the sample size of the crop (see below).
- Sample items of crops such as peas or beans protected from the spray by foliage and also from parts exposed to the spray.
- To provide a representative sample of the raw commodity, adhering soil may have to be removed. This may be done by brushing and, if necessary, gentle rinsing with cold running water.
- Do not trim except for the removal of obviously decomposed or withered leaves. Details of any trimming should be recorded.

The quantities to be taken are shown in Table V.3.

Cereals:

- If the plot is small, cut the whole yield.
- If the plot is large but mechanical harvesting is not carried out, cut not less than twelve short lengths of row chosen from all over the plot. Cut stalks 15 cm above the ground and remove the grain from the straw.
- Care should be taken to avoid contamination when mechanical methods are used to separate the parts of the crop. The operation is best carried out in the laboratory.
- If the plots are harvested mechanically, take not less than twelve grab samples of grain and straw from the harvester at uniform intervals over the plot.
- Do not sample within 1 metre of the edges of the plot.

The quantities to be taken are shown in Table V.4.

Grasses, forage and animal feed:

- Cut with shears at normal harvest height (usually 5 cm above the ground) the vegetation from not less than twelve areas uniformly spaced over the entire plot, leaving 1 metre at the edges of the plot.
- Record height of cutting and avoid soil contamination.
- Crops which are harvested mechanically can be sampled from the harvester as it proceeds through the crop.

The quantities to be taken are shown in Table V.5.

Sugar cane (GS 0659)

Select whole canes from 12 areas of the plot and take short, e.g., 20 cm, sections from all parts of the length of the canes. Care is necessary owing to the rapid changes which normally occur in cane juices. If required, 1 litre samples of juice should be taken and frozen immediately and then shipped in cans.

Table V.3 Sampling of other vegetables

Commodity	Codex Code No.	Quantity, method of collection
Large Brassica crops e.g., cabbage, cauliflower, kohlrabi	Group 010	12 plants
Broccoli	VB 0400	1 kg from 12 plants
Brussels sprouts	VB 0402	1 kg from 12 plants. Buttons to be taken from at least two levels on each plant.
Cucumbers	VC 0424	12 fruits from 12 separate plants
Gherkins, courgettes, squash	Group p 011	12 fruits from 12 plants (the sample should weigh at least 2 kg - where necessary take a larger number of fruit to produce a 2 kg sample)
Melons, gourds, pumpkins, watermelons	Group 011	12 fruits from 12 separate plants
Egg plants (aubergines)	VO 0440	12 fruits from 12 separate plants
Sweet corn	VO 0447	12 ears (the sample should weigh at least 2 kg - where necessary take a larger number of items to produce a 2 kg sample.)
Mushrooms	VO 0450	12 items (the sample should weigh at least 0.5 kg - where necessary take a larger number of items to produce a 0.5 kg sample)
Tomatoes, Peppers	VO 0448 VO 0051	24 fruits from small-fruiting varieties, 12 from large fruiting varieties. From 12 plants in all cases. (The sample should weigh a minimum of 2 kg - where necessary take a larger number of items to produce a 2 kg sample.)
Endive[a]	VL 0476	12 plants
Lettuce[a]	VL 0482, VL 0483	12 plants
Spinach[a], Chicory leaves[a]	VL 0502 VL 0469	1 kg from 12 plants
Kale	VL 0480	2 kg from 12 plants sampled from two levels on the plant
Small-leaf salad crops e.g., cress, dandelion, corn salad	Group 013	0.5 kg from 12 plants (or sites in plot)
Peas, Phaseolus beans e.g., French, kidney, runner	Group 014	1 kg (fresh green or dry seed as appropriate)
Pulses e.g., dried broad beans, field beans, lentils, soya beans	Group 015	1 kg

Commodity	Codex Code No.	Quantity, method of collection
Celery	VS 0624	12 plants
Asparagus, Rhubarb	VS 0621 VS 0627	12 sticks from 12 separate plants.(the sample should weigh a minimum of 2 kg where necessary take a larger number of sticks to produce a 2 kg sample)
Globe artichoke	VS 0620	12 heads
Fodder crops	Groups 050, 051, 052	2 kg from 12 separate areas of plot. (Crops harvested mechanically can be sampled from the harvester as it proceeds through the crop.)
Oilseed e.g., rape seed, mustard seed, poppy seed	Group 023	

Note: (a) also at immature stages during decline studies

Table V.4 Sampling of cereals

Commodity	Codex Code No.	Quantity, method of collection
Cereal grains e.g., wheat, barley, oats, rye, triticale and other small grain cereals; maize (off the cob), rice, sorghum	Group 020	1 kg
Straw of the above crops	Group 051	0.5 kg
Maize straw, fodder and forage (mature plants excluding cobs)	AF 0645 (forage) AS 0645 (fodder)	12 plants. (Cut each stem into three equal lengths (with leaves attached). Take top portion from stems 1 to 4, middle portion from stems 5 to 8 and bottom portion from stems 9 to 12, thus ensuring that parts of all 12 stems are included in the sample.)
Green or silage maize	Group 051	12 plants. (Cut each stem and subsample as in previous item, retaining any cobs present on the appropriate portions of stem.)
Maize cobs	Group 051	12 ears. (The sample should weigh at least 2 kg - where necessary, take a larger number of ears to produce a 2 kg sample.)

Table V.5 Sampling of forage crops and animal feed

Commodity	Codex Code No.	Quantity, method of collection
Green forage or silage crops of alfalfa, clover, pea and bean forage, vetch, sainfoin, lotus, soya bean fodder and forage, rye forage, fodder cereals, sorghum forage	Group 050, 051	1 kg
Dry hay of the above crops	Group 050, 051	0.5 kg

Seeds

Use essentially the same technique as for cereals, taking samples of mature seed from at least twelve parts of the plot. Where the sample is harvested by hand, seed should normally be sent to the laboratory in the pod. Where mechanical harvesting is used, only the seed should be supplied.

Cotton seed (Codex Code No. SO 0691):

- Pick the cotton at the normal stage of harvesting. Take 1 kg, with or without fibre.

Peanuts (Codex Code No. SO 0697):

- Collect at the normal stage of harvesting. Take 1 kg.

Sesame seed, rape seed (Codex Code Nos. SO 0700, SO 0495):

- Collect the pods when they have reached the stage of maturity at which they are normally harvested. Take 1 kg.

Sunflower seed, safflower seed (Codex Code Nos. SO 0702, 0699):

- Where the sampling is done by hand select ripe heads. Where it is done mechanically submit the seed to the laboratory. Take 12 heads or 1 kg of seed .

Coffee and cacao beans (Codex Code Nos. SB 0716, 0715):

- Take samples in a manner reflecting common practice, quantity 1 kg. - The freshly harvested produce is not normally required.

Herbs and spices; tea leaves; hops; beer

- Take samples in a manner reflecting common practice.
- The freshly harvested produce is not normally required for tea although herbs, such as parsley and chives, should be sampled fresh. In the case of hops, both fresh and dried cones should be supplied.

Table V.6. Sampling of herbs, spices; tea leaves; hops and beer

Commodity	Codex Code No.	Quantity, method of collection
Garden herbs and medicinal plants e.g., parsley, thyme	Group 027 Group 028 Group 057	0.5 kg fresh 0.2 kg dry
Teas (dry leaves)	Group 066	0.2 kg
Hops (dry cones)	DH 1100	0.5 kg
Beer		1 litre

5. SAMPLING ANIMAL TISSUES, MILK AND EGGS

Farm animal feeding and external animal treatment studies are conducted in order to quantify levels of residues in meat, milk, eggs and edible meat by-products, such as fat, liver, kidney following the use of a pesticide product.

The sampling protocol shall be designed taking into account the specific objectives of the studies. The minimum mass of samples to be collected (taken from OECD Guidelines for the Testing of Chemicals, Test No. 505: Residues in Livestock) is shown in the following tables.

Table V.7. Sampling ruminants

Sample Material	**Sampling Method**	**Analytical Sample Preparation**	**Weight/unit (homogenised) Laboratory Sample**
Meat	Collect approx. equal pieces of loin, flank or hind-leg (round piece) muscle	After coarse pre-chopping, macerate in a mincer and then mix carefully.	0.5 kg

Sample Material	Sampling Method	Analytical Sample Preparation	Weight/unit (homogenised) Laboratory Sample
Fat	Collect approx. equal quantities of subcutaneous, mesenterial and perirenal fat	After coarse pre-chopping, macerate in a mincer and then mix carefully [a]	0.5 kg
Liver	Collect the entire organ or representative parts thereof, e.g., a cross-section of the lobes	After coarse pre-chopping, macerate in a mincer and then mix carefully.	0.4 kg
Kidney	Sub-sample from both kidneys	Macerate tissue in a mincer and then mix carefully.	0.2 kg
Raw Milk [b]	Collect milk from each animal separately		0.5 l

[a] For fat-soluble compounds, samples of perirenal, mesenterial and subcutaneous fat from ruminants should be analysed individually, not as a composite

[b] For fat-soluble compounds, residues in the milk fat need to be determined at the end of dosing in addition to the plateau level. The fat should preferably be separated from the milk by physical means, not by chemical solvent extraction, because in solvent extraction residues are extracted from both the aqueous and the lipid phase. As in this way, cream (containing 40–60% fat) and not 100% milk fat is obtained; the lipid content of the cream should also be reported. Where a depuration phase is included after the dosing period, samples taken at a minimum of four time-points after the last day of treatment is recommended

Tissues from different animals should not be combined or pooled at sampling.

Table V.8. Poultry

Sample Material' [a]	Sampling Method	Analytical Sample Preparation	Weight/unit (homogenised) Laboratory Sample
Meat	Collect approx. equal pieces of leg and breast	Macerate pieces of meat from 3 hens [b] in a mincer and then mix carefully.	0.5 kg
Skin with fat	Collect all the abdominal fat from at least 3 hens	Chop the fat of 3 hens [b]	0.05 kg
Liver	Collect the entire organ	Chop the livers of 3 hens [b]	0.05 kg
Eggs		Clean shells, breakeggs from 3 hens, combine the whites/yolks, discard the shells [c] Limited analysis of yolk and white separately for some chemicals [c,d]	3 units

[a] For dermal uses on poultry, skin should also be analysed.

[b.] The prerequisite for combining of sample material is that at least 3 samples per dose group are available (i.e., at least 9 animals are involved).

[c] Samples can be prepared either before or after transport to the analytical laboratory. The eggs are homogenised by addition of solvent on commencement of analysis.

[d] Analyses of eggs should be conducted on the egg yolk and white combined in one sample, For fat-soluble residues some analysis of the deposition of residues into yolk and white fractions may be conducted to determine how the residue partitions between the egg fractions. The residue levels in yolk and whites may be analysed separately provided the weights of each are known, so that the residue can be calculated on a whole egg basis for the purpose of MRL setting. Yolk and white would require separation prior to storage of the samples.

Table V.9. Pig/Swine

Sample Material [a]	Sampling Method	Analytical Sample Preparation	Weight/unit (homogenised) Laboratory Sample
Meat	Collect approx. equal pieces of loin, flank or hind-leg (round	After coarse pre-chopping, macerate in a mincer and then mix carefully.	0.5 kg

	piece) muscle		
Fat	Collect approx. equal quantities of subcutaneous, mesenterial and perirenal fat	After coarse pre-chopping, macerate in a mincer and then mix carefully [b].	0.5 kg
Liver	Collect the entire organ or representative parts thereof	After coarse pre-chopping, macerate in a mincer and then mix carefully.	0.4 kg
Kidney	Sub-sample from both kidneys	Macerate tissue in a mincer and then mix carefully.	0.2 kg
Skin	Collect approx. equal pieces of back, flank and belly	After coarse pre-chopping, macerate in a mincer and then mix carefully	0.5 kg

[a] For dermal uses on swine, skin should also be analysed.

[b] For fat-soluble compounds, samples of perirenal, mesenterial and subcutaneous fat from ruminants should be analysed individually, not as a composite.

6. SAMPLING PROCESSED COMMODITIES

Where a commodity is normally processed between harvest and marketing, for example by milling, pressing, fermentation, drying or extraction, data may be required on the processed crop or its products. Details of the processing method should be supplied with the samples together with storage and handling histories. In such cases, the trials should be designed to provide samples with appropriate residue levels so that the fate of residues can be studied during the processing. Sample separately any cleanings, husks or by-products which could be used for animal feed. The minimum mass of samples as described in the Codex recommended method of sampling should be observed as far as practical.

7. SAMPLING STORED COMMODITIES

Supervised trials of post-harvest treatments of stored products should be carried out over a wide range of storage facilities, and the sampling technique must be carefully chosen if valid samples are to be obtained. Procedures for taking valid samples from most commodities in storage units are well established. Such procedures are acceptable in sampling for pesticide residue analysis and may be used if adequate references are given.

The sampling procedures are usually designed for three kinds of storage conditions.

Sampling from bulk

Obtaining a representative sample from a (large) bulk container, e.g., of cereal grains, is difficult; if possible, samples should be taken at frequent intervals from the stream during transfer into another container. A probe sample is not representative but may be acceptable if:

- it is possible to reach every part of the storage container
- a larger number of individual samples are taken before mixing and reducing to produce a final sample.

Pesticide residues are normally higher in the dust fraction and this should be recognised in the sampling procedure.

Sampling bagged commodities

Sampling of the commodity within a bag must be random. A representative sample from a large stack of bags can be obtained only if every bag is accessible. This is not always possible

in practice and the alternative is to obtain a sample from a number of randomly chosen bags by probing. Since pesticide treatments are often directed to the surface of the bag, selective sampling to show the effect of the position of the bag in the stack and the penetration of the pesticide into the bag may be necessary.

Sampling fruit and vegetables in packing houses

Where post-harvest treatments are applied to fruit and vegetables in packing houses, an adequate number of samples must be taken to determine the range of residue levels resulting from variations in the treatment process. The effects on residue levels of concentration, temperature, duration of treatment, drying (after dip treatments) and subsequent handling may need to be considered.

Post-harvest treated fruit and vegetables should be kept in, or packed in, commercial containers or punnets and stored at ambient or cool-room temperature according to normal commercial practice. Samples should then be drawn for analysis from the commercial containers at suitable intervals representing the time expected between treatment and subsequent marketing. The rate of disappearance or degradation of some residues depends on whether the commodity is held in a sealed or partly sealed container or is open to the air.

The sizes of samples to be taken are the identical as suggested in Tables V.1–V.3.

8. SAMPLE SIZE REDUCTION

Large samples cannot be handled economically, especially if freezing and long transport are involved. Take only that amount prescribed in the Study Plan noting the minimum sample size requirements indicated in Tables V.1–V.9.

Except cereal grains sampled on a conveyor belt or from the stream of material transferred from one large container to another, mixing of samples and sample size reduction at the field site is not recommended and should be avoided.

9. SAMPLE PACKING AND STORAGE

Once packed and labelled, samples may be stored or immediately sent to the residue laboratory according to the nature of the sample. The mode of shipping (e.g. deep-frozen or at ambient temperature shall be selected taking into account the stability of the residue and the kind of study undertaken.

It is important that packing and shipment are carried out in such a way that the samples arrive as soon as possible (normally within 24–36 hours) after being taken and without change of any kind, e.g., deterioration, physical damage, contamination, loss of residue, or change in moisture content.

Storage and shipping should always be under deep-frozen conditions.

Packing

Containers

Individual samples should be placed in suitable containers, e.g., heavy polyethylene bags, and then put inside additional heavy paper bags and, where necessary, frozen or refrigerated as soon as possible after sampling according to the nature of the chemical involved. Polyethylene

bags alone may become brittle in contact with dry ice and therefore there is a risk of breakage and subsequent loss of the sample.

Avoid other plastic containers or plastic-lined caps, unless made of "Teflon" or other inert plastic which does not interfere with the analytical method (laboratories have frequently experienced such interference), and PVC bags should be avoided. If cans are used, they should first be checked to demonstrate the absence of materials such as oil films, lacquers or resin from soldered joints that could interfere with analyses.

Glass containers should be used for liquid samples and should be thoroughly cleaned and rinsed with one or more suitable pesticide-free solvent such as acetone, isopropyl alcohol or hexane, and dried before use. Pesticides can migrate to the walls of a container and be adsorbed; hence even a glass container, after the sample is poured out, should be rinsed with solvent if the extraction is not made in the container itself.

In summary, any type of container or wrapping material should be checked before use for possible interference with the analytical method and at the limit of determination of the analysis.

Fasten boxes securely with strong twine, rope or tape.

Shipment of samples

Non-perishable commodities containing residues that are known to be stable over the period required to reach the laboratory can be shipped in a non-frozen state, but samples should be protected against any effects which might cause degradation or contamination.

Where samples need to be frozen, use shipping containers of polystyrene foam, if available, as they are excellent for this purpose. If not available, use two cardboard boxes of slightly different size with insulation between. Proper insulation is essential to ensure samples arrive at the residue laboratory still frozen. Sufficient dry ice must be used for some to remain when samples are received at the residue laboratory. This usually requires a minimum of one kg of dry ice per kg of sample. For journeys lasting more than two days, two kg of dry ice or more per kg of sample may be required. Poorly insulated containers require more dry ice. Use caution in handling dry ice (gloves and ventilated work area). Packages must of course comply with transport regulations.

Frozen samples must never be allowed to thaw, either before or during shipment. They must be shipped under conditions that permit their arrival at the residue laboratory still solidly frozen.

The consignee should be advised by FAX or email of the full details of shipment of samples, including shipping document numbers and flight numbers, so that delay in delivery to the laboratory is avoided.

When samples have to be shipped across national boundaries, quarantine regulations must be observed and appropriate permits obtained well in advance of dispatching samples.

Labels and records

Label each sample with the appropriate sample identification. The label and ink should be such that the writing will not be illegible if the label becomes wet. Attach the label securely so that it cannot come loose during shipment, and place the label so that it will not become wet from condensation.

Complete the Sampling Report (residue data sheets) clearly and accurately with all the requested trial details. Failure to do so may mean that data will not be acceptable. The

completed sheets should be protected by enclosing them in protective polythene bags which should be sent with the sample. Duplicate sheets should be kept by the sender.

Use a label on the outside of the shipping container stating the following: “Perishable Goods: Deliver immediately upon arrival” and 'This material is not fit for human consumption”.

Sample reception and handling

Immediately upon arrival of the samples, the residue laboratory personnel should:

- Verify that the copy of the Sampling Report is included with the samples.
- Check and report on the condition of the samples.
- Check to see that the samples match the details of the Sampling Report.
- Check the Sampling Report for accuracy (especially the rate and interval data) and verify that the information is complete.
- Check the Sampling Report to determine whether any special treatment or testing is indicated.

If there are any deviations of any consequence, or the Sampling Report is not received or is incomplete (in such a way that a proper comparison is not possible), the samples should be stored in the simplest form that will preserve the residue and the crop. The trial organiser should then be contacted immediately to determine how to proceed.

Note: it is dangerous to put packages containing dry ice into deep freeze.

Storage

Samples should be analysed as quickly as possible after collection before physical and chemical changes occur. If prolonged storage is unavoidable, it is usually preferable to store the samples at a low temperature, preferably at or below –20 °C. This removes the residue from contact with enzymes which might degrade the pesticide and also prevents further possibility of residues being “bound” in the tissue. Do not store samples (whole or homogenised) for analysis unless an adequate check has been made on the stability of the residue. Fumigant residue samples need special attention and ideally should be analysed immediately on receipt at the laboratory. Storage at –20 °C is likely to be inadequate to prevent loss of fumigant residues.

Studies of the stability of residues in samples, over the time and at the temperature of storage, should be carried out with representative pesticides and substrates. When there is doubt about the stability of residues in storage, spiked control samples should be held under the same conditions as the samples or extracts.

Light degrades many pesticides; it is therefore advisable to protect the sample and any solutions or extracts from needless exposure. Samples other than water should ordinarily be stored in a freezer, preferably at –20 °C or below. Even then, physical and chemical changes may occur either in the sample or in the residues sought. Extended storage in freezers can cause moisture to migrate to the surface of the sample then to the freezer coils, slowly desiccating the sample. This effect may be of importance if water content affects the subsequent analysis and can affect the calculated residue concentration. Water samples should be stored slightly above freezing to avoid rupture of the container as a result of freezing.

Appendix VI

PORTION OF COMMODITIES TO WHICH CODEX MAXIMUM RESIDUE LIMITS APPLY AND WHICH IS ANALYSED

INTRODUCTION

Codex Maximum Residue Limits are in most cases stated in terms of a specific whole raw agricultural commodity as it moves in international trade. In some instances, a qualification is included that describes the part of the raw agricultural commodity to which the maximum residue limit applies, for example, almonds on a shell-free basis and beans without pods. In other instances, such qualifications are not provided. Therefore, unless otherwise specified, the portion of the raw agricultural commodity to which the MRL applies and which is to be prepared as the analytical sample for the determination of pesticide residues is as described in the following table.

Classification of Commodities	Portion of Commodity to Which the Codex MRL Applies (and Which Is Analysed)
Group 1 - ROOT AND TUBER VEGETABLES (Codex Classification[69] Group 016: Root and tuber vegetables)	
Root and tuber vegetables are starchy foods derived from the enlarged solid roots, tubers, corms or rhizomes, mostly subterranean, of various species of plants. The entire vegetable may be consumed.	
Root and tuber vegetables: beets, carrots, celeriac, parsnips, potatoes, radishes, rutabagas, sugar beet, sweet potatoes, turnips, yams	Whole commodity after removing tops. Wash the roots or tubers in cold running water, brushing gently with a soft brush to remove loose soil and debris, if necessary, and then dab lightly with clean tissue paper to dry. For carrots, after drying the tops are carefully cut off with a knife by cutting through the bottom of the stem at the lowest point of attachment of the outer petioles. If an annulus of root tissue is thereby severed from hollow-crown roots, the material should be re-combined with the roots.
Group 2 - BULB VEGETABLES (Codex Classification Group: 009 Bulb vegetables)	
Bulb vegetables are pungent, flavourful foods derived from the fleshy scale bulbs or growth buds of alliums of the lily family *(Liliaceae)*. The entire bulb may be consumed following removal of the parchment-like skin.	Remove adhering soil (e.g., by rinsing in running water or by gentle brushing of the dry commodity)
Bulb vegetables: garlic, leeks, onions, spring onions	Bulb, dry onions and garlic: Whole commodity after removal of roots and whatever parchment skin is easily detached. Leeks and spring onions: Whole vegetable after removal of roots and adhering soil.

69 The number and categories of groups for portion of commodities do not always correspond to the grouping used by the current Codex Classification of Foods and Animal Feeds. The corresponding groups are given in brackets.

Group 3 - LEAFY VEGETABLES (EXCEPT BRASSICA VEGETABLES) (Does not correspond to Codex Classification Group 013: Leafy vegetables (including Brassica leafy vegetables))	
Leafy vegetables (except Group 4 vegetables) are foods derived from the leaves of a wide variety of edible plants including leafy parts of Group 1 vegetables. The entire leaf may be consumed. Leafy vegetables of the brassica family are grouped separately.	
Leafy vegetables: beet leaves, corn salad, endive, lettuce, radish leaves, spinach, sugar beet leaves, Swiss chard	Whole commodity after removal of obviously decomposed or withered leaves.
Group 4 - BRASSICA (COLE) LEAFY VEGETABLES (Does not correspond to Codex Classification Group 010: Brassica vegetables)	
Brassica (cole) leafy vegetables are foods derived from the leafy parts, stems and immature inflorescences of plants commonly known and botanically classified as brassicas and also known as cole vegetables. The entire vegetable may be consumed.	
Brassica leafy vegetables: broccoli, Brussels sprouts, cabbage, cabbage, Chinese, cabbage, red, cabbage, Savoy, cauliflower, collards, kales, kohlrabi, mustard greens	Whole commodity after removal of obviously decomposed or withered leaves. For cauliflower and headed broccoli analyse flower head and stems, discarding leaves; for Brussels sprouts analyse “buttons” only.
Group 5 - STEM VEGETABLES (Codex Classification Group 017: Stalk and stem vegetables)	
Stem vegetables are foods derived from the edible stems or shoots of a variety of plants.	
Stem vegetables: artichoke, celery, chicory (witloof), rhubarb	Whole commodity after removal of obviously decomposed or withered leaves. Rhubarb and asparagus: stems only. Celery and asparagus: remove adhering soil (e.g., by rinsing in running water or by gentle brushing of the dry commodity).
Group 6 - LEGUME VEGETABLES (Codex Classification Group 014: Legume vegetables Group 015: Pulses)	
Legume vegetables are derived from the dried or succulent seeds and immature pods or leguminous plants commonly known as beans and peas. Succulent forms may be consumed as whole pods or as the shelled product. Legume fodder is in Group 18.	
Legume vegetables: beans, broad beans, cow peas, dwarf beans, French beans, green beans, kidney beans, Lima beans, navy beans, runner beans, snap beans, soybeans, peas, sugar peas	Whole commodity.
Group 7 - FRUITING VEGETABLES - EDIBLE PEEL (Combination of Codex Classification Groups 011: Fruiting vegetables, Cucurbits; 012 Fruiting vegetables other than Cucurbits)	
Fruiting vegetables - edible peel are derived from the immature or mature fruits of various plants, usually annual vines or bushes. The entire fruiting vegetables may be consumed.	
Fruiting vegetables - edible peel: cucumber, egg plant, gherkin, okra, pepper, summer squash, tomato, mushroom[70]	Whole commodity after removal of stems.

70 Mushroom is not included in the commodities listed in the original document

Group 8 - FRUITING VEGETABLES - INEDIBLE PEEL (Codex Classification Group 011 Fruiting vegetables, Cucurbits)	
Fruiting vegetables inedible peel are derived from the immature or mature fruits of various plants, usually annual vines or bushes. Edible portion is protected by skin, peel or husk which is removed or discarded before consumption.	
Fruiting vegetables - inedible peel: cantaloupe, melon, pumpkin, squash, watermelon, winter squash	Whole commodity after removal of stems.
Group 9 - CITRUS FRUITS (Codex Classification Group 001 Citrus fruits)	
Citrus fruits are produced by trees of the *Rutaceae* family and are characterized by aromatic oily peel, globular form and interior segments of juice-filled vesicles. The fruit is fully exposed to pesticides during the growing season. The fruit pulp may be consumed in succulent form and as a beverage. The entire fruit may be used for preserving.	
Citrus fruits: Orange, lemon, mandarin	Whole commodity.
Group 10 - POME FRUITS (Codex Classification Group 002 Pome fruits)	
Pome fruits are produced by trees related to the genus *Pyrus* of the rose family (*Rosaceae*). They are characterized by fleshy tissue surrounding a core consisting of parchment-like carpels enclosing the seed. The entire fruit, except the core, may be consumed in the succulent form or after processing.	
Pome fruits: apple, pear, quince	Whole commodity after removal of stems.
Group 11 - STONE FRUITS (Codex Classification Group 003 Stone fruits)	
Stone fruits are produced by trees related to the genus *Prunus* of the rose family (*Rosaceae*) characterized by fleshy tissue surrounding a single hard-shelled seed. The entire fruit, except seed, may be consumed in a succulent or processed form.	
Stone fruits: apricots, cherries, sour cherries, sweet cherries, nectarines, peaches, plums	Whole commodity after removal of stems and stones but the residue calculated and expressed on the whole commodity without stem.
Group 12 - SMALL FRUITS AND BERRIES (Codex Classification Group 004: Berries and other small fruits)	
Small fruits and berries are derived from a variety of plants whose fruit is characterized by a high surface-weight ratio. The entire fruit, often including seed, may be consumed in a succulent or processed form.	
Small fruits and berries: blackberries, blueberries, boysenberries, cranberries, currants, dewberries, gooseberries, grapes, loganberries, raspberries, strawberries	Whole commodity after removal of caps and stems. Currants: fruit with stems.
Group 13 - ASSORTED FRUITS - EDIBLE PEEL (Codex Classification Group 005: Assorted tropical and sub-tropical fruit - edible peel)	
Assorted fruits - edible peel are derived from the immature or mature fruits of a variety of plants, usually shrubs or trees from tropical or subtropical regions. The whole fruit may be consumed in a succulent or processed form.	
Assorted fruits - edible peel: dates, figs, olives	Dates and olives: whole commodity after removal of stems and stones but residue calculated and expressed on the whole fruit. Figs: Whole commodity.

Group 14 - ASSORTED FRUITS - INEDIBLE PEEL (Codex Classification Group 006: Assorted tropical and sub-tropical fruit - inedible peel)	
Assorted fruits - inedible peel are derived from the immature or mature fruits of different kinds of plants, usually shrubs or trees from tropical or subtropical regions. Edible portion is protected by skin, peel or husk. Fruit may be consumed in a fresh or processed form.	
Assorted fruits - inedible peel: avocados, bananas, guavas, kiwi fruit, mangoes, papayas, passion fruits, pineapples	Whole commodity unless qualified. Pineapples: after removal of crown. Avocado and mangoes: whole commodity after removal of stone but calculated on whole fruit. Bananas: after removal of crown tissue and stalks.
Group 15 - CEREAL GRAINS (Codex Classification Group 020: Cereal grains)	
Cereal grains are derived from the clusters of starchy seeds produced by a variety of plants primarily of the grass family (*Gramineae*). Husks are removed before consumption.	
Cereal grains: barley, maize, oats, rice, rye, sorghum, sweet corn, wheat	Whole commodity. Fresh corn and sweet corn: kernels plus cob without husk.
Group 16 - STALK AND STEM CROPS (Codex Classification Group 051: Straw, fodder and forage of cereal grains and grasses)	
Stalk and stem crops are various kinds of plants, mostly of the grass family (*Gramineae*) cultivated extensively as animal feed and for the production of sugar. Stems and stalks used for animal feeds are consumed as succulent forage, silage, or as dried fodder or hay. Sugar crops are processed.	
Stalk and stem crops: barley fodder and straw, grass fodders, maize fodder, sorghum fodder	Whole commodity.
Group 17 - LEGUME OILSEEDS (Part of Codex Classification Group 023: Nuts and seeds)	
Legume oilseeds are mature seeds from legumes cultivated for processing into edible vegetable oil or for direct use as human food.	
Legume oilseeds: peanuts	Whole kernel after removal of shell.
Group 18 - LEGUME ANIMAL FEEDS (Codex Classification Group 050: Legume animal feeds)	
Legume animal feeds are various species of legumes used for animal forage, grazing, fodder, hay or silage with or without seed. Legume animal feeds are consumed as succulent forage or as dried fodder or hay.	
Legume animal feeds: alfalfa fodder, bean fodder, clover fodder, peanut fodder, pea fodder, soybean fodder	Whole commodity.
Group 19 - TREE NUTS (Codex Classification Group 022: Tree nuts)	
Tree nuts are the seeds of a variety of trees and shrubs which are characterized by a hard, inedible shell enclosing an oil seed. The edible portion of the nut is consumed in succulent, dried or processed form.	
Tree nuts: almonds, chestnuts, filberts, macadamia nuts, pecans, walnuts	Whole commodity after removal of shell. Chestnuts: whole in skin.

Group 20 - OILSEEDS (Codex Classification Group 23: Nuts and seeds)	
Oilseed consists of the seed from a variety of plants used in the production of edible vegetable oils. Some important vegetable oilseeds are by-products of fibre or fruit crops.	
Oilseed: cotton seed, linseed, rapeseed, safflower seed, sunflower seed	Whole commodity.
Group 21 - TROPICAL SEEDS (Codex Classification Group 024: Seed for beverages and sweets)	
Tropical seeds consist of the seeds from several tropical and semitropical trees and shrubs mostly used in the production of beverages and confections. Tropical seeds are consumed after processing.	
Tropical seeds: cacao beans, coffee beans	Whole commodity.
Group 22 - HERBS (Codex Classification Group 027: Herbs)	
Herbs consist of leaves, stems and roots from a variety of herbaceous plants used in relatively small amounts to flavour other foods. They are consumed in succulent or dried form as components of other foods.	
Herbs:	Whole commodity.
Group 23 - SPICES (Codex Classification Group 028: Spices)	
Spices consist of aromatic seeds, roots, fruits and berries from a variety of plants used in relatively small amounts to flavour other foods. They are consumed primarily in the dried form as components of other foods.	
Spices:	Whole commodity.
Group 24 - TEAS (Codex Classification Group 066: Teas)	
Teas are derived from the leaves of several plants, but principally *Camellia sinensis*. They are used in the preparation of infusions for consumption as stimulating beverages. They are consumed as extracts of the dried or processed product.	
Teas:	Whole commodity.
Group 25 - MEATS (Codex Classification Group 030: Meat)	
Meats are the muscular tissue, including adhering fatty tissue, from animal carcasses prepared for wholesale distribution. The entire product may be consumed.	
Meats: carcass meat (and carcass fat), carcass meat of cattle, carcass meat of goats, carcass meat of horses, carcass meat of pigs, carcass meat of sheep	Whole commodity. (For fat soluble pesticides a portion of carcass fat is analysed and MRLs apply to carcass fat.)
Group 26 - ANIMAL FATS (Codex Classification Group 031: Mammalian fats)	
Animal fats are the rendered or extracted fat from the fatty tissue of animals. The entire product may be consumed.	
Animal fats: cattle fat, pig fat, sheep fat	Whole commodity.
Group 27 - MEAT BYPRODUCTS (Codex Classification Group 0032: Edible offal (mammalian))	
Meat byproducts are edible tissues and organs, other than meat and animal fat, from slaughtered animals as prepared for wholesale distribution. Examples: liver, kidney, tongue, heart. The entire product may be consumed.	

Meat byproducts (such as liver, kidney, etc.): cattle meat byproducts, goat meat byproducts, pig meat byproducts, sheep meat byproducts	Whole commodity.
Group 28 - MILKS (Codex Classification Group 033: Milks)	
Milks are the mammary secretions of various species of lactating herbivorous ruminant animals, usually domesticated. The entire product may be consumed.	
Milks:	Whole commodity[71].
Group 29 - MILK FATS (Codex Classification Group 086: Milk fats)	
Milk fats are the fats rendered or extracted from milk.	
Milk fats:	Whole commodity.
Group 30 - POULTRY MEATS (Codex Classification Group 036: Poultry meat)	
Poultry meats are the muscular tissues, including adhering fat and skin, from poultry carcasses as prepared for wholesale distribution. The entire product may be consumed.	
Poultry Meats:	Whole commodity. (For fat soluble pesticides a portion of carcass fat is analysed and MRLs apply to carcass fat.)
Group 31 - POULTRY FATS (Codex Classification Group 037: Poultry fat)	
Poultry fats are the rendered or extracted fats from fatty tissues of poultry. The entire product may be consumed.	
Poultry fats:	Whole commodity.
Group 32 - POULTRY BYPRODUCTS (Codex Classification Group 038: Poultry, edible offal of)	
Poultry byproducts are edible tissue and organs, other than poultry meat and poultry fat, from slaughtered poultry.	
Poultry byproducts:	Whole commodity.
Group 33 - EGGS (Codex Classification Group 039: Eggs)	
Eggs are the fresh edible portion of the reproductive body of several avian species. The edible portion includes egg white and egg yolk after removal of the shell.	
Eggs:	Whole egg whites and yolks combined after removal of shells.

[71] Deviation form the Codex Guideline based on the decision of CCPR

Appendix VII

STANDARDIZED FORMAT FOR ORGANIZING THE DATA DIRECTORY (INDEX) OF INFORMATION TO BE SUBMITTED FOR EVALUATION

The purpose of the data directory is to assist the reader (reviewer) to find the studies related to the standard headings of a residue evaluation; or to be quite certain that no studies are available for particular sections. Initially the data directory will also assist the FAO Secretary to decide on the size of the review and how much work is required. See also Chapter 4, "Preparation of data submissions for the consideration of the FAO Panel of the JMPR."

The relevant sections required for the data directory are provided below and examples of subheadings are included. OECD data point numbers indicate the studies classified in the OECD Guidance Documents for Pesticide Registration[72].

In each section the references should be in systematic order. The year is the year of publication of the study, project or experiment in the residue evaluations. The study, project or experiment number should correspond with the company name, i.e., if the study number quoted is that of the contracted laboratory, the contracted laboratory's name should be given in the reference. Where a laboratory name and study number and a company name and study number are provided, both sets of information may be included. Where a study consists of a number of individual trials, include all trial numbers in the reference. Refer to the following examples.

> Boner, P. L. 1998. Metabolism of [^{14}C] methyl parathion in lettuce. Xenobiotic Laboratories, Inc., Project XBL97072, PSI 97.438. Unpublished.
> van Zyl, P. 1997. Determination of the magnitude of residues of pyriproxyfen in citrus. South-Africa, 1996 trials. Study 96/194. Report 311/88176/N194. South African Bureau of Standards. Report NNR-0048. Sumitomo, Japan. Unpublished.
> Cañez, V.M. 1989. The magnitude of methyl parathion residues on sunflower. Huntingdon Analytical Services, Project PAL-MP-SS, includes MP-SS-7128, MP-SS-7129. Unpublished.

If a section has no study, include the heading and the statement "No study submitted".

The data directory should include the volume numbers in the dossier showing where each study is located. For very large dossiers (five boxes or more), a summary of the allocations of volumes to boxes should also be provided. In situations where the volume number is not known at the time the directory is first submitted, an amended directory (including the volume number) should be included with the final data submission.

Provide an electronic copy of the data directory in Word format.

DATA DIRECTORY FORMAT

1. BACKGROUND INFORMATION

Identity

(OECD data point numbers IIA 2.1, 2.2, 2.3, 2.4, 2.6, 2.7, 2.7, 2.9)

[72] OECD. 2001. Dossier Guidance —OECD guidance for industry data submissions on plant protection products and their active substances. http://www1.oecd.org/ehs/PestGD03.htm

Physical and chemical properties

Vapour pressure

Relevant study references. Volume in data dossier.

Octanol-water partition coefficient

Relevant study references. Volume in data dossier.

.....etc

2. METABOLISM AND ENVIRONMENTAL FATE

Proposed subdivisions are indicated under those headings where generally a number of reports for a range of commodities are provided. Rotational crop studies should appear under environmental fate in soil.

Animal metabolism

(OECD data point numbers IIA 6.2.2, 6.2.3)

Subdivided according to laboratory animal, livestock, poultry

Relevant study references. Volume in data dossier.

Plant metabolism

(OECD data point number IIA 6.2.1)

Subdivided, where necessary, according to crop

Relevant study references. Volume in data dossier.

Environmental fate in soil

(OECD data point numbers IIA 6.6, 7.1, 7.2.1, 7.2.4, 7.3.1, 7.4.1, 7.4.2, 7.4.3, 7.4.4, 7.4.5)

Relevant study references. Volume in data dossier.

Environmental fate in water-sediment systems

(OECD data point numbers IIA 7.5, 7.6, 7.8.3)

Relevant study references. Volume in data dossier.

3. RESIDUE ANALYSIS

Analytical methods

- Methods used in the supervised trials and processing studies
- Enforcement methods (OECD data point number IIA 4.3)
- Specialized methods
- Subheadings by substrate, e.g., commodity or soil, may be of use.

Relevant study references. Volume in data dossier.

Stability of residues in stored analytical samples

(OECD data point number IIA 6.1)

Subdivided, where necessary, according to commodity
Relevant study references. Volume in data dossier.

4. USE PATTERNS

List of crops for which Good Agricultural Practice (GAP) information is available, the relevant country(ies) (listed alphabetically), and whether labels will be available.

List of labels.

5. RESIDUES RESULTING FROM SUPERVISED TRIALS ON CROPS

(OECD data point number IIA 6.3)

Subheadings by commodity organized according to the Codex Classification

Citrus fruits

lemons
oranges
tangelos

Relevant study references. Volume in data dossier.

Pome fruits

apples
pears

Relevant study references. Volume in data dossier.

Stone fruits

Relevant study references. Volume in data dossier.....etc.

Relevant study references. Volume in data dossier ..... etc.

6. FATE OF RESIDUES IN STORAGE AND PROCESSING

In storage

Subdivided, where necessary, according to commodity.
Relevant study references. Volume in data dossier.

In processing

(OECD data point number IIA 6.5)

Subdivided, where necessary, according to commodity.
Relevant study references. Volume in data dossier.

7. RESIDUES IN ANIMAL COMMODITIES

Farm animal feeding studies
(OECD data point number IIA 6.4)

Relevant study references. Volume in data dossier.

Direct animal treatments
Relevant study references. Volume in data dossier.

8. RESIDUES IN FOOD IN COMMERCE OR AT CONSUMPTION

Relevant study references. Volume in data dossier.

9. NATIONAL RESIDUE DEFINITIONS

A list of the countries for which this information is available should be included.

State the source of the information and its date.

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Appendix VIII

PESTICIDE INFORMATION FOR CCPR WORKING GROUP ON PRIORITIES[73]

for evaluation _____

for re-evaluation _____

1. NAME:
2. STRUCTURAL FORMULA:
3. CHEMICAL NAME:
4. TRADE NAME:
5. NAMES AND ADDRESSES OF BASIC PRODUCERS:
6. JUSTIFICATION FOR USE:
7. USES: MAJOR
   MINOR
8. COMMODITIES MOVING IN INTERNATIONAL TRADE AND LEVELS OF RESIDUES:
9. COUNTRIES WHERE PESTICIDE IS REGISTERED:
10. NATIONAL MAXIMUM RESIDUE LIMITS:
11. COMMODITIES FOR WHICH THE NEED FOR ESTABLISHING CODEX MRLs ARE RECOGNIZED:
12. MAJOR INTERNATIONAL USE PATTERN:
13. LIST OF DATA (TOXICOLOGY, METABOLISM, RESIDUE) AVAILABLE:
14. DATE DATA COULD BE SUBMITTED TO THE JMPR:
15. PROPOSAL FOR INCLUSION SUBMITTED BY (COUNTRY):

[73] This information is to be provided by Codex member countries for inclusion of a pesticide in the Codex Priority List.

Appendix IX

MAXIMUM PROPORTION OF AGRICULTURAL COMMODITIES IN ANIMAL FEED

The livestock feed tables were developed by the OECD Pesticide Residue Chemistry Group and published in Draft Revised Guidance Document on Overview of Residue Chemistry Studies (Series on Testing And Assessment No.64) 18Feb 2009.

The tables should be used based on the procedure described in section **6.**12.1 of the Manual. To assists their use, Table IX.1 provides matching Codex commodities with the feedstuffs listed in the tables together with the Codex commodity code numbers.

The tables IX.2-IX.4 include the Codex commodity group codes as well to facilitate the selection of commodities for calculation of the appropriate animal burden.

If the residues are already expressed on dry weight basis then the dry matter content given in the tables should be replaced with 100%.

Table IX.1 Description of feedstuffs and the corresponding Codex commodity description

Codex		OECD		Name of group
Code	Commodity	Crop	Feedstuff	
AL1020	Alfalfa forage (green)	Alfalfa	forage	legumes, forage and fodder
AL1021	Alfalfa fodder	Alfalfa	hay	legumes, forage and fodder
AF		Alfalfa	meal	legumes, forage and fodder
AF		Alfalfa	silage	legumes, forage and fodder
AF		Barley	forage	legumes, forage and fodder
AS0640	Barley straw and fodder, dry	Barley	hay	pulp, processed
VB0041	Cabbages, head	Cabbage	heads, leaves	cereal, processed
AS0641	Barley straw and odder, dry	Barley	straw	grasses, forage
VR0596	Sugar beet	Beet, sugar	tops	cereal grain
AF		Barley	silage	grasses, fodder
AV0569	Sugar beet leaves or tops	Beet, mangel	fodder	grasses, forage
AL1030	Bean forage (green)	Bean	vines	grasses, fodder
AL1031	Clover hay and fodder	Clover	hay	pulses
AL1023	Clover	Clover	forage	legumes, forage and fodder
AF		Clover	silage	misc, forage and fodder
AS0645	Maize fodder	Corn, field	stover	pulp, processed
AF		Corn, pop	stover	pulp, processed
AF		Corn, sweet	forage	misc. edible products of plant origin
AF0645	Maize forage	Corn, field	forage/silage	miscellaneous, fodder and forage
AF		Corn, sweet	stover	pulp, processed
AF		Cowpea	forage	Brassica leafy vegetables
AF		Cowpea	hay	miscellaneous, processed
AF		Crown vetch	forage	root vegetables

Codex		OECD		Name of group
Code	Commodity	Crop	Feedstuff	
AF		Crown vetch	hay	root vegetables
AF		Grass	forage (fresh)	
AF		Grass	hay	pulp, processed
AF		Grass	silage	legumes, forage and fodder
AV480	Kale forage	Kale	leaves	legumes, forage and fodder
AL1025	Lespedeza	Lespedeza	forage	legumes, forage and fodder
AF	Lespedeza	Lespedeza	hay	miscellaneous, processed
AF		Millet	forage	cereal, processed
AF		Millet	hay	cereal, processed
AF		Oat	straw	cereal, processed
AS0646	Millet fodder, dry	Millet	straw	grasses, forage
AS0647	Oat straw and fodder, dry	Oat	hay	cereal grain
AL0528	Pea vines (green)	Pea	vines	cereal, processed
AF		Oat	silage	cereal, processed
AF0647	Oat forage	Oat	forage	grasses, fodder
AF		Pea	silage	cereal grain
AL0072	Pea hay or fodder	Pea	hay	grasses, fodder
AS0649	Rice straw and fodder, dry	Rice	straw	pulp, processed
AL0697	Peanut fodder	Peanut	hay	grasses, forage
VL0495	Rape greens	Rape	forage	grasses, fodder
AF		Rye	silage	miscellaneous, processed
AS0650	Rye straw and fodder, dry	Rye	straw	miscellaneous, processed
AF		Rice	whole crop silage	miscellaneous, processed
AF0650	Rye forage (green)	Rye	forage	oilseed
AF0651	Sorghum forage (green)	Sorghum, forage	see Grasses	legumes, forage and fodder
		Sorghum, grain	forage	legumes, forage and fodder
AS	Sorghum straw and fodder, dry	Sorghum, grain	stover	pulses
AF		Sorghum, grain	silage	legumes, forage and fodder
AL1265	Soya bean forage (green)	Soybean	forage	legumes, forage and fodder
AL0541	Soya bean fodder	Soybean	hay	pulp, processed
AF		Soybean	silage	miscellaneous, processed
AF		Sugarcane	tops	pulp, processed
AL		Trefoil	forage	grasses, forage
AF		Trefoil	hay	grasses, fodder
AF		Triticale	forage	grasses, forage
AF		Triticale	hay	misc, forage and fodder
AF		Triticale	straw	legumes, forage and fodder
AF		Triticale	silage	legumes, forage and fodder
AV0506	Turnip leaves or tops	Turnip	tops (leaves)	pulses
AF		Vetch	forage	miscellaneous, processed
AF		Vetch	hay	grasses, forage
AS0654	Wheat straw and fodder, dry	Wheat	hay	cereal grain
AF		Vetch	silage	grasses, fodder
AF		Wheat	forage	grasses, fodder
AS0654	Wheat straw and fodder, dry	Wheat	straw	grasses, forage
VR0463	Cassava	Cassava/tapioca	roots	cereal grain
AF		Wheat	silage	grasses, fodder
VR0577	Carrot	Carrot	culls	grasses, forage
VR0589	Potato culls	Potato	culls	miscellaneous, processed

Codex		OECD		Name of group
Code	Commodity	Crop	Feedstuff	
VR506	Turnip, Garden	Turnip	roots	legumes, forage and fodder
GC0640	Barley	Barley	grain	pulses
VR0497	Swede	Swede	roots	legumes, forage and fodder
VD0071	Beans, dry	Bean	seed	legumes, forage and fodder
GC0645	Maize	Corn, field	grain	miscellaneous, processed
GC0656	Popcorn	Corn, pop	grain	pulp, processed
VG0527	Cowpea	Cowpea	seed	root vegetables
GC0646	Millet	Millet	grain	pulp, processed
VD0545	Lupin	Lupin	seed	pulp, processed
GC0647	Oats	Oat	grain	misc, forage and fodder
VD0561	Field pea, (dry)	Pea	seed	miscellaneous, processed
GC0653	Triticale	Triticale	grain	cereal, processed
GC0651	Sorghum	Sorghum, grain	grain	cereal grain
SO4724 VD4521	Soya bean, dry	Soybean	seed	cereal, processed
GC0649	Rice	Rice	grain	grasses, fodder
GC0650	Rye	Rye	grain	grasses, forage
AL1029	Vetch	Vetch	seed	
GC0654	Wheat	Wheat	grain	grasses, forage
AB		Barley	bran fractions	cereal grain
AB9226	Apple pomace, dry	Apple	pomace, wet	grasses, forage
AB		Almond	hulls	grasses, fodder
AB0596	Sugar beet pulp, dry	Beet, sugar	dried pulp	miscellaneous, processed
AB		Beet, sugar	ensiled pulp	miscellaneous, processed
SM		Coconut	meal	cereal, processed
DM0596	Sugar beet molasses	Beet, sugar	molasses	grasses, forage
AB001	Citrus pulp, dry	Citrus	dried pulp	cereal grain
AB	Rape seed meal	Canola	meal	grasses, forage
AB		Brewer's grain	dried	grasses, fodder
AB	Maize aspirated grain fraction	Corn, field	asp gr fn	grasses, forage
AB	Maize gluten meal	Corn gluten	meal	miscellaneous, processed
AB	Maize milled byproducts	Corn, field	milled bypdts	legumes, forage and fodder
AB		Corn, field	hominy meal	legumes, forage and fodder
AB		Cotton	undelinted seed	miscellaneous, processed
AB		Cotton	meal	miscellaneous, processed
AB		Cotton	hulls	miscellaneous, processed
AB		Cotton	gin byproducts	miscellaneous, processed
AB		Corn gluten	feed	pulses
AB		Corn, sweet	cannery waste	legumes, forage and fodder
AB0269	Grape pomce, dry	Grape	pomace, wet	miscellaneous, processed
SO0693	Linseed	Flaxseed/linseed	meal	
AB		Distiller's grain	dried	misc, forage and fodder
AB		Lupin seed	meal	miscellaneous, processed
VS0626	Palm hearts	Palm	kernel meal	root vegetables
SO0697	Peanut	Peanut	meal	pulp, processed
AB		Pineapple	process waste	legumes, forage and fodder
		Potato	process waste	grasses, fodder
AB		Potato	dried pulp	grasses, fodder
AB		Rice	hulls	grasses, forage
AB		Rape	meal	grasses, fodder
CM		Rice	bran/pollard	grasses, forage
		Sesame seed	meal	cereal grain
AB		Sorghum, grain	asp gr. Fn,	root vegetables

Codex		OECD		Name of group
Code	Commodity	Crop	Feedstuff	
		Safflower	meal	misc, forage and fodder
AB		Soybean	asp gr fn	grasses, forage
AB		Soybean	meal	grasses, fodder
AB		Soybean	okara	
AB		Soybean	hulls	grasses, forage
AB		Wheat	asp gr fn	cereal, processed
AB		Soybean	pollard	grasses, forage
AB		Tomato	pomace, wet	cereal grain
AB		Sugarcane	molasses	grasses, fodder
AB		Wheat gluten	meal	cereal, processed
AB		Sunflower	meal	grasses, forage
AB		Sugarcane	bagasse	grasses, fodder
AB		Wheat	milled bypdts	cereal, processed

Table IX.2 Beef and dairy cattle

Codex Code	CROP	Feedstuff	IFN Code	Residue Level	DM (%)	BEEF Cattle				DAIRY Cattle			
						US CAN	EU	AU	JP	US CAN	EU	AU	JP
	Body weight (kg)					500	500	500	730	600	650	500	600
	Daily intake (DM in kg)					9.1	12	20	14	24	25	20	17
	Forages												
AL1020	Alfalfa	forage	2-00-196	HR	35	*	70	100	*	20	40	60	*
AL1021	Alfalfa	hay	1-00-054	HR	89	15	*	80	10	20	40	60	25
AF	Alfalfa	meal	1-00-023	HR	89	*	*	40	10	10	40	40	25
AF	Alfalfa	silage	3-08-150	HR	40	*	25	100	*	20	40	40	20
AF	Barley	forage	2-00-511	HR	30	*	30	50	*	*	30	50	*
AS0640	Barley	hay	1-00-495	HR	88	15	*	100	*	20	*	50	*
AS0641	Barley	straw	1-00-498	HR	89	10	30	100	*	10	30	20	*
AF	Barley	silage	NA	HR	40	*	30	100	*	*	30	50	*
AL1030	Bean	vines	2-14-388	HR	35	*	*	60	*	*	20	70	*
AV0569	Beet, mangel	fodder	2-00-632	HR	15	*	30	*	*	*	25	*	*
VR0596	Beet, sugar	tops	2-00-649	HR	23	*	20	*	*	*	30	*	*
VB0041	Cabbage	heads, leaves	2-01-046	HR	15	*	20	*	*	*	20	*	*
AL1023	Clover	forage	2-01-434	HR	30	*	30	100	*	20	40	60	*
AL1031	Clover	hay	1-01-415	HR	89	15	30	100	*	20	40	60	*
AF	Clover	silage	3-01-441	HR	30	*	25	100	*	20	40	60	*
AF0645	Corn, field	forage/silage	3-28-345	HR	40	15	80	80	*	45	60	80	20/50
AS0645	Corn, field	stover	3-28-251	HR	83	15	25	40	*	15	20	40	*
AF	Corn, pop	stover	2-02-963	HR	85	15	25	20	*	*	20	20	*
AF	Corn, sweet	forage	1-08-407	HR	48	*	*	80	*	45	*	40	*
AF	Corn, sweet	stover	NA	HR	83	*	*	40	*	15	*	20	*
AF	Cowpea	forage	2-01-655	HR	30	*	35	100	*	20	35	60	*
AF	Cowpea	hay	1-01-645	HR	86	*	35	100	*	20	35	60	*
AF	Crown vetch	forage	2-19-834	HR	30	*	*	100	*	10	*	100	*
AF	Crown vetch	hay	1-20-803	HR	90	*	*	100	*	*	*	100	*
AF	Grass	forage (fresh)	2-02-260	HR	25	*	50	100	5	45	60	100	10
AF	Grass	hay	1-02-250	HR	88	15	50	100	40	45	60	60	70
AF	Grass	silage	3-02-222	HR	40	*	50	100	5	45	60	60	80
AV480	Kale	leaves	2-02-446	HR	15	*	20	*	*	*	20	40	*
AL1025	Lespedeza	forage	2-07-058	HR	22	*	*	20	*	40	*	60	*
AF	Lespedeza	hay	1-02-522	HR	88	15	*	20	*	40	*	60	*
AF	Millet	forage	2-03-801	HR	30	*	*	100	*	20	30	50	*
AF	Millet	hay	1-03-119	HR	85	10	*	100	*	20	*	50	*
AS0646	Millet	straw	1-23-802	HR	90	10	10	80	*	10	*	50	*
AF0647	Oat	forage	2-03-292	HR	30	*	20	100	*	30	20	90	5
AS0647	Oat	hay	1-03-280	HR	90	15	20	100	*	30	20	90	5
AF	Oat	straw	1-03-283	HR	90	10	20	80	*	10	20	60	5
AF	Oat	silage	3-03-298	HR	35	*	*	100	*	*	*	40	5
AL0528	Pea	vines	3-03-596	HR	25	*	20	60	*	10	20	40	*
AL0072	Pea	hay	1-03-572	HR	88	*	25	100	*	10	30	70	*
AF	Pea	silage	3-03-590	HR	40	*	25	100	*	10	30	40	*
AL0697	Peanut	hay	1-03-619	HR	85	*	*	60	*	15	*	60	*
VL0495	Rape	forage	2-03-867	HR	30	*	10	100	*	10	10	40	*
AS0649	Rice	straw	1-03-925	HR	90	*	10	60	55	*	5	20	25
AF	Rice	whole crop silage		HR	40				5				55
AF0650	Rye	forage	2-04-018	HR	30	*	20	100	*	20	20	20	*
AS0650	Rye	straw	1-04-007	HR	88	10	20	20	*	10	20	20	5
AF	Rye	silage		HR	28				*				5
AF0651	Sorghum, forage	see Grasses											
	Sorghum, grain	forage	2-04-317	HR	35	15	20	70	*	40	20	70	40
AS	Sorghum, grain	stover	1-07-960	HR	88	15	15	70	*	15	15	70	5
AF	Sorghum, grain	silage		HR	21				*				10
AL1265	Soybean	forage	2-04-574	HR	56	*	*	100	*	20	*	40	*
AL0541	Soybean	hay	1-04-558	HR	85	*	*	80	*	20	*	40	*

Codex Code	CROP	Feedstuff	IFN Code	Residue Level	DM (%)	BEEF Cattle				DAIRY Cattle			
						US CAN	EU	AU	JP	US CAN	EU	AU	JP
	Body weight (kg)					500	500	500	730	600	650	500	600
	Daily intake (DM in kg)					9.1	12	20	14	24	25	20	17
AF	Soybean	silage	3-04-581	HR	30	*	*	80	*	20	*	40	*
AF	Sugarcane	tops	2-04-692	HR	25	*	*	50	*	*	*	25	*
AL	Trefoil	forage	2-20-786	HR	30	*	20	100	*	40	40	40	*
AF	Trefoil	hay	1-05-044	HR	85	15	20	90	*	40	40	40	*
AF	Triticale	forage	2-02-647	HR	30	*	20	100	*	20	20	70	*
AF	Triticale	hay	NA	HR	88	15	20	100	*	20	20	70	*
AF	Triticale	straw	NA	HR	90	10	20	50	*	10	20	70	*
AF	Triticale	silage	3-26-208	HR	35	*	*	90	*	*	*	50	*
AV0506	Turnip	tops (leaves)	2-05-063	HR	30	*	40	80	*	30	20	*	*
AF	Vetch	forage	2-05-112	HR	30	*	25	90	*	20	25	35	*
AF	Vetch	hay	1-05-122	HR	85	15	25	90	65	20	25	35	25
AF	Vetch	silage	3-26-357	HR	30	*	*	90	*	*	*	50	60
AF	Wheat	forage	2-08-078	HR	25	*	20	100	*	20	20	60	*
AS0654	Wheat	hay	1-05-172	HR	88	15	20	100	*	20	20	20	*
AS0654	Wheat	straw	1-05-175	HR	88	10	20	80	*	10	20	20	*
AF	Wheat	silage	3-05-186	HR	30	*	*	90	*	*	*	50	*
	Roots & Tubers												
VR0577	Carrot	culls	2-01-146	HR	12	*	15	5	*	10	15	5	*
VR0463	Cassava/tapioca	roots	2-01-156	HR	37	*	20	*	*	*	15	*	*
VR0589	Potato	culls	4-03-787	HR	20	30	30	10	*	10	30	10	*
VR0497	Swede	roots	4-04-001	HR	10	*	40	10	*	*	20	10	*
VR506	Turnip	roots	4-05-067	HR	15	*	20	10	*	10	20	10	*
	Cereal Grains/Crops Seeds												
GC0640	Barley	grain	4-00-549	HR	88	50	70	80	70	45	40	40	40
VD0071	Bean	seed	4-00-515	HR	88	*	20	50	*	*	20	15	*
GC0645	Corn, field	grain	4-20-698	HR	88	80	80	80	75	45	30	20	80
GC0656	Corn, pop	grain	4-02-964	HR	88	80	*	80	75	45	30	20	80
VG0527	Cowpea	seed	5-01-661	HR	88	*	20	20	*	*	20	20	*
VD0545	Lupin	seed	5-02-707	HR	88	*	20	40	*	*	20	20	*
GC0646	Millet	grain	4-03-120	HR	88	50	40	50	*	20	40	50	*
GC0647	Oat	grain	4-03-309	HR	89	*	40	80	55	20	40	10	5
VD0561	Pea	seed	5-03-600	HR	90	*	20	40	*	*	20	20	*
GC0649	Rice	grain	4-03-939	HR	88	20	*	40	*	20	*	20	*
GC0650	Rye	grain	4-04-047	HR	88	20	40	80	35	20	40	*	15
GC0651	Sorghum, grain	grain	4-04-383	HR	86	40	40	80	35	45	40	50	30
SO4724 VD4521	Soybean	seed	5-64-610	HR	89	5	10	20	15	10	10	20	10
GC0653	Triticale	grain	4-20-362	HR	89	20	40	80	*	20	40	30	*
AL1029	Vetch	seed	5-26-351	HR	89	*	*	20	*	*	*	20	*
GC0654	Wheat	grain	4-05-211	HR	89	20	40	80	25	20	40	20	10
	By-products												
AM 0660	Almond	hulls	4-00-359	STMR	90	*	*	10	*	10	*	10	*
AB9226	Apple	pomace, wet	4-00-419	STMR	40	*	20	20	*	10	10	10	*
AB	Barley	bran fractions		STMR	90				10				*
AB0596	Beet, sugar	dried pulp	4-29-307	STMR	88	15	20	*	5	15	20	*	40
AB	Beet, sugar	ensiled pulp	4-00-662	STMR	15	*	25	*	*	*	40	*	*
DM0596	Beet, sugar	molasses	4-30-289	STMR	75	10	10	*	*	10	10	*	*
AB	Brewer's grain	dried	5-00-516	STMR	92	50	10	50	45	30	15	20	40
AB	Canola	meal	5-08-136	STMR	88	5	*	20	*	10	10	15	*
AB001	Citrus	dried pulp	4-01-237	STMR	91	10	5	30	*	10	20	30	*
SM	Coconut	meal	5-01-572	STMR	91	*	20	30	*	*	10	*	*
AB	Corn, field	asp gr. fn.	4-02-880	STMR	85	5	*	*	*	*	*	*	*
AB	Corn, field	milled bypdts	5-28-235	STMR	85	50	30	15	5	25	30	15	*
AB	Corn, field	hominy meal	4-03-010	STMR	88	50	*	40	35	25	*	40	*
AB	Corn, sweet	cannery waste	2-02-875	STMR	30	*	*	30	*	10	*	10	*

Codex Code	CROP	Feedstuff	IFN Code	Residue Level	DM (%)	BEEF Cattle				DAIRY Cattle			
						US CAN	EU	AU	JP	US CAN	EU	AU	JP
	Body weight (kg)					500	500	500	730	600	650	500	600
	Daily intake (DM in kg)					9.1	12	20	14	24	25	20	17
AB	Corn gluten	feed	5-28-243	STMR	40	75	30	20	25	25	30	*	20
AB	Corn gluten	meal	5-28-242	STMR	40	75	15	20	*	25	20	*	15
AB	Cotton	meal	5-01-617	STMR	89	5	5	30	*	10	5	15	*
AB	Cotton	undelinted seed	5-01-614	STMR	88	*	*	30	*	10	10	20	*
AB	Cotton	hulls	1-01-599	STMR	90	10	*	20	*	*	*	10	*
AB	Cotton	gin by-products	1-08-413	STMR	90	5	*	*	*	*	*	*	*
AB	Distiller's grain	dried	5-00-518	STMR	92	50	10	50	10	25	10	*	15
SO0693	Flaxseed/linseed	meal	5-02-043	STMR	88	5	10	10	*	10	15	10	*
AB0269	Grape	pomace, wet	2-02-206	STMR	15	*	*	20	*	*	*	20	*
AB	Lupin seed	meal	NA	STMR	85	*	20	15	*	*	20	15	*
VS0626	Palm	kernel meal	5-03-486	STMR	90	*	*	20	5	*	25	10	5
SO0697	Peanut	meal	5-03-649	STMR	85	*	20	10	*	10	10	15	*
AB	Pineapple	process waste	NA	STMR	25	10	*	60	*	10	*	30	*
AB	Potato	process waste	4-03-777	STMR	12	30	40	5	*	10	30	*	*
AB	Potato	dried pulp	4-03-775	STMR	88	*	10	5	*	*	10	5	*
AB	Rape	meal	5-26-093	STMR	88	*	20	15	15	*	10	15	25
AB	Rice	hulls	1-08-075	STMR	90	*	*	5	*	*	*	10	*
CM	Rice	bran/ pollard	4-03-928	STMR	90	15	*	40	20	15	20	40	10
SN	Sesame seed	meal	NA	STMR	90								
SM	Safflower	meal	5-26-095	STMR	91	5	20	20	*	10	10	15	*
AB	Sorghum, grain	asp gr fn	NA	STMR	85	5	*	20	*	*	*	*	*
AB	Soybean	asp gr fn	NA	STMR	85	5	*	*	*	*	*	*	*
AB	Soybean	meal	5-20-638	STMR	92	5	20	10	65	10	25	15	60
AB	Soybean	hulls	1-04-560	STMR	90	15	10	*	*		10	*	*
AB	Soybean	okara	NA	STMR	20	*	*	*	40				20
AB	Soybean	pollard	NA	STMR	?	*	*	15	*	*	*	*	*
AB	Sugarcane	molasses	4-13-251	STMR	75	10	10	30	*	10	10	25	*
AB	Sugarcane	bagasse	1-04-686	STMR	32	*	*	20	*	*	*	25	*
AB	Sunflower	meal	5-26-098	STMR	92	5	20	30	*	10	10	15	*
AB	Tomato	pomace, wet	NA	STMR	20			10	*			10	*
AB	Wheat	asp gr fn	NA	STMR	85	5	*	*	*	*	*	*	*
AB	Wheat gluten	meal	5-05-221	STMR	40	10	15	*	*	10	20	*	*
AB	Wheat	milled bypdts.	4-06-749	STMR	88	40	30	40	55	30	30	40	45

Table IX. 3 Percent of poultry diet

Codex code	CROP	Feedstuff	IFN Code	Residue Level	DM (%)	POULTRY, BROILER				POULTRY, LAYER				TURKEY		
						US CAN	EU	AU	JP	US CAN	EU	AU	JP	US CAN	EU	AU
	Body weight (kg)					2	1.7	2	3	1.9	1.9	2	2	8	7	2
	Daily intake (DM in kg)					0.16	0.12	0.15	N/A	0.12	0.13	0.15	0.10	0.50	0.50	0.15
	Forages															
AL1020	Alfalfa	forage	2-00-196	HR	35	*	*	*	5	*	*	*	*	*	*	*
AL1021	Alfalfa	hay	1-00-054	HR	89	*	*	*	*	*	*	*	*	*	*	*
AF	Alfalfa	meal	1-00-023	HR	89	5	5	10	*	5	10	10	10	5	5	10
AF	Alfalfa	silage	3-08-150	HR	40	*	*	*	*	*	*	*	*	*	*	*
AF	Barley	forage	2-00-511	HR	30	*	*	*	*	*	*	*	*	*	*	*
AS0640	Barley	hay	1-00-495	HR	88	*	*	*	*	*	*	*	*	*	*	*
AS0641	Barley	straw	1-00-498	HR	89	*	*	*	*	*	5	*	*	*	*	*
AF	Barley	silage	NA	HR	40	*	*	*	*	*	*	*	*	*	*	*
AL1030	Bean	vines	2-14-388	HR	35	*	*	*	*	*	*	*	*	*	*	*
AV0569	Beet, mangel	fodder	2-00-632	HR	15	*	*	*	*	*	*	*	*	*	*	*
VR0596	Beet, sugar	tops	2-00-649	HR	23	*	*	*	*	*	5	*	*	*	*	*
VB0041	Cabbage	heads, leaves	2-01-046	HR	15	*	*	*	*	*	5	*	*	*	*	*
AL1023	Clover	forage	2-01-434	HR	30	*	*	*	*	*	10	*	*	*	*	*
AL1031	Clover	hay	1-01-415	HR	89	*	*	*	*	*	10	*	*	*	*	*
AF	Clover	silage	3-01-441	HR	30	*	*	*	*	*	10	*	*	*	*	*
AF0645	Corn, field	forage/ silage	3-28-345	HR	40	*	*	*	*	*	10	*	*	*	*	*
AS0645	Corn, field	stover	3-28-251	HR	83	*	*	*	*	*	10	*	*	*	*	*
AF	Corn, pop	stover	2-02-963	HR	85	*	*	*	*	*	10	*	*	*	*	*
AF	Corn, sweet	forage	1-08-407	HR	48	*	*	*	*	*	*	*	*	*	*	*
AF	Corn, sweet	stover	NA	HR	83	*	*	*	*	*	*	*	*	*	*	*
AF	Cowpea	forage	2-01-655	HR	30	*	*	*	*	*	10	*	*	*	*	*
AF	Cowpea	hay	1-01-645	HR	86	*	*	*	*	*	10	*	*	*	*	*
AF	Crown vetch	forage	2-19-834	HR	30	*	*	*	*	*	10	*	*	*	*	*
AF	Crown vetch	hay	1-20-803	HR	90	*	*	*	*	*	10	*	*	*	*	*
AF	Grass	forage (fresh)	2-02-260	HR	25	*	*	*	*	*	10	*	*	*	*	*
AF	Grass	hay	1-02-250	HR	88	*	*	*	*	*	10	*	*	*	*	*
AF	Grass	silage	3-02-222	HR	40	*	*	*	*	*	10	*	*	*	*	*
AV480	Kale	leaves	2-02-446	HR	15	*	*	*	*	*	5	*	*	*	*	*
AL1025	Lespedeza	forage	2-07-058	HR	22	*	*	*	*	*	10	*	*	*	*	*
AF	Lespedeza	hay	1-02-522	HR	88	*	*	*	*	*	10	*	*	*	*	*
AF	Millet	forage	2-03-801	HR	30	*	*	*	*	*	10	*	*	*	*	*

Codex code	CROP	Feedstuff	IFN Code	Residue Level	DM (%)	POULTRY, BROILER				POULTRY, LAYER				TURKEY		
						US CAN	EU	AU	JP	US CAN	EU	AU	JP	US CAN	EU	AU
	Body weight (kg)					2	1.7	2	3	1.9	1.9	2	2	8	7	2
	Daily intake (DM in kg)					0.16	0.12	0.15	N/A	0.12	0.13	0.15	0.10	0.50	0.50	0.15
AF	Millet	hay	1-03-119	HR	85	*	*	*	*	*	10	*	*	*	*	*
AS0646	Millet	straw	1-23-802	HR	90	*	*	*	*	*	*	*	*	*	*	*
AF0647	Oat	forage	2-03-292	HR	30	*	*	*	*	*	10	*	*	*	*	*
AS0647	Oat	hay	1-03-280	HR	90	*	*	*	*	*	10	*	*	*	*	*
AF	Oat	straw	1-03-283	HR	90	*	*	*	*	*	*	*	*	*	*	*
AF	Oat	silage	3-03-298	HR	35	*	*	*	*	*	*	*	*	*	*	*
AL0528	Pea	vines	3-03-596	HR	25	*	*	*	*	*	10	*	*	*	*	*
AL0072	Pea	hay	1-03-572	HR	88	*	*	*	*	*	10	*	*	*	*	*
AF	Pea	silage	3-03-590	HR	40	*	*	*	*	*	10	*	*	*	*	*
AL0697	Peanut	hay	1-03-619	HR	85	*	*	*	*	*	*	*	*	*	*	*
VL0495	Rape	forage	2-03-867	HR	30	*	*	*	*	*	10	*	*	*	*	*
AS0649	Rice	straw	1-03-925	HR	90	*	*	*	*	*	*	*	*	*	*	*
AF	Rice	whole crop silage		HR	40											
AF0650	Rye	forage	2-04-018	HR	30	*	*	*	*	*	10	*	*	*	*	*
AS0650	Rye	straw	1-04-007	HR	88	*	*	*	*	*	*	*	*	*	*	*
AF	Rye	silage		HR	28											
AF0651	Sorghum,forage	see Grasses														
	Sorghum, grain	forage	2-04-317	HR	35	*	*	*	*	*	10	*	*	*	*	*
AS	Sorghum, grain	stover	1-07-960	HR	88	*	*	*	*	*	10	*	*	*	*	*
AF	Sorghum, grain	silage		HR	21											
AL1265	Soybean	forage	2-04-574	HR	56	*	*	*	*	*	10	*	*	*	*	*
AL0541	Soybean	hay	1-04-558	HR	85	*	*	*	*	*	10	*	*	*	*	*
AF	Soybean	silage	3-04-581	HR	30	*	*	*	*	*	10	*	*	*	*	*
AF	Sugarcane	tops	2-04-692	HR	25	*	*	*	*	*	*	*	*	*	*	*
AL	Trefoil	forage	2-20-786	HR	30	*	*	*	*	*	10	*	*	*	*	*
AF	Trefoil	hay	1-05-044	HR	85	*	*	*	*	*	10	*	*	*	*	*
AF	Triticale	forage	2-02-647	HR	30	*	*	*	*	*	*	*	*	*	*	*
AF	Triticale	hay	NA	HR	88	*	*	*	*	*	*	*	*	*	*	*
AF	Triticale	straw	NA	HR	90	*	*	*	*	*	*	*	*	*	*	*
AF	Triticale	silage	3-26-208	HR	35	*	*	*	*	*	*	*	*	*	*	*
AV0506	Turnip	tops (leaves)	2-05-063	HR	30	*	*	*	*	*	*	*	*	*	*	*
AF	Vetch	forage	2-05-112	HR	30	*	*	*	*	*	10	*	*	*	*	*
AF	Vetch	hay	1-05-122	HR	85	*	*	*	*	*	10	*	*	*	*	*
AF	Vetch	silage	3-26-357	HR	30	*	*	*	*	*	*	*	*	*	*	*
AF	Wheat	forage	2-08-078	HR	25	*	*	*	*	*	10	*	*	*	*	*
AS0654	Wheat	hay	1-05-172	HR	88	*	*	*	*	*	10	*	*	*	*	*
AS0654	Wheat	straw	1-05-175	HR	88	*	*	*	*	*	10	*	*	*	*	*
AF	Wheat	silage	3-05-186	HR	30	*	*	*	*	*	*	*	*	*	*	*

Codex code	CROP	Feedstuff	IFN Code	Residue Level	DM (%)	POULTRY, BROILER				POULTRY, LAYER				TURKEY		
						US CAN	EU	AU	JP	US CAN	EU	AU	JP	US CAN	EU	AU
	Body weight (kg)					2	1.7	2	3	1.9	1.9	2	2	8	7	2
	Daily intake (DM in kg)					0.16	0.12	0.15	N/A	0.12	0.13	0.15	0.10	0.50	0.50	0.15
	Roots & Tubers															
VR0577	Carrot	culls	2-01-146	HR	12	*	10	*	*	*	10	*	*	*	10	*
VR0463	Cassava/tapioca	roots	2-01-156	HR	37	*	20	*	*	*	15	*	*	*	5	*
VR0589	Potato	culls	4-03-787	HR	20	*	10	*	*	*	10	*	*	*	20	*
VR0497	Swede	roots	4-04-001	HR	10	*	10	*	*	*	10	*	*	*	10	*
VR506	Turnip	roots	4-05-067	HR	15	*	10	*	*	*	10	*	*	*	10	*
	Cereal Grains/Crops Seeds															
GC0640	Barley	grain	4-00-549	HR	88	75	70	15	10	75	100	15	*	75	50	15
VD0071	Bean	seed	4-00-515	HR	88	*	20	70	*	*	20	70	*	*	20	70
GC0645	Corn, field	grain	4-20-698	HR	88	75	70	*	70	75	70	*	80	75	50	*
GC0656	Corn, pop	grain	4-02-964	HR	88	75	*	*	70	75	*	*	80	*	*	*
VG0527	Cowpea	seed	5-01-661	HR	88	10	5	5	*	10	10	5	*	10	5	10
VD0545	Lupin	seed	5-02-707	HR	88	10	15	15	*	10	10	10	*	10	10	50
GC0646	Millet	grain	4-03-120	HR	88	60	70	70	*	60	70	60	*	60	50	15
GC0647	Oat	grain	4-03-309	HR	89	75	70	15	*	75	70	15	*	75	50	5
VD0561	Pea	seed	5-03-600	HR	90	20	20	5	*	20	20	5	*	20	20	40
GC0649	Rice	grain	4-03-939	HR	88	20	*	50	*	20	*	50	*	20	*	60
GC0650	Rye	grain	4-04-047	HR	88	35	70	50	*	35	35	35	*	35	60	60
GC0651	Sorghum, grain	grain	4-04-383	HR	86	75	70	70	65	75	70	70	55	75	50	15
SO4724 VD4521	Soybean	seed	5-64-610	HR	89	20	20	15	*	20	15	15	*	20	15	15
GC0653	Triticale	grain	4-20-362	HR	89	75	15	*	*	75	15	*	*	75	15	60
AL1029	Vetch	seed	5-26-351	HR	89	*	*	*	*	*	*	*	*	*	*	*
GC0654	Wheat	grain	4-05-211	HR	89	75	70	70	10	75	70	55	*	75	50	*
	By-products															
AM 0660	Almond	hulls	4-00-359	STMR	90	*	*	*	*	*	*	*		*	*	*
AB9226	Apple	pomace, wet	4-00-419	STMR	40	*	*	*	*	*	*	*		*	*	*
AB	Barley	bran fractions		STMR	90				*							
AB0596	Beet, sugar	dried pulp	4-29-307	STMR	88	*	*	*	*	*	*	*		*	*	*
AB	Beet, sugar	ensiled pulp	4-00-662	STMR	15	*	*	*	*	*	*	*		*	*	*
DM0596	Beet, sugar	molasses	4-30-289	STMR	75	*	*	*	*	*	*	*		*	*	*
AB	Brewer's grain	dried	5-00-516	STMR	92	*	10	*	*	*	10	*		*	10	5
AB	Canola	meal	5-08-136	STMR	88	15	18	5	*	15	10	5		15	20	*
AB001	Citrus	dried pulp	4-01-237	STMR	91	*	*	*	*	*	*	*		*	*	*
SM	Coconut	meal	5-01-572	STMR	91	*	*	*	*	*	*	*		*	*	*
AB	Corn, field	asp gr fn	4-02-880	STMR	85	*	*	*	*	*	*	*		*	*	*

Codex code	CROP	Feedstuff	IFN Code	Residue Level	DM (%)	POULTRY, BROILER				POULTRY, LAYER				TURKEY		
						US CAN	EU	AU	JP	US CAN	EU	AU	JP	US CAN	EU	AU
	Body weight (kg)					2	1.7	2	3	1.9	1.9	2	2	8	7	2
	Daily intake (DM in kg)					0.16	0.12	0.15	N/A	0.12	0.13	0.15	0.10	0.50	0.50	0.15
AB	Corn, field	milled bypdts	5-28-235	STMR	85	50	60	*	*	50	50	*		50	50	20
AB	Corn, field	hominy meal	4-03-010	STMR	88	20	*	20	*	20	20	20		20	20	*
AB	Corn, sweet	cannery waste	2-02-875	STMR	30	*	*	*	*	*	*	*		*	*	*
AB	Corn gluten	feed	5-28-243	STMR	40	*	10	*	*	*	*	*		*	*	*
AB	Corn gluten	meal	5-28-242	STMR	40	*	10	*	*	*	10	*		*	10	10
AB	Cotton	meal	5-01-617	STMR	89	20	5	10	*	20	5	10		20	10	*
AB	Cotton	undelinted seed	5-01-614	STMR	88	*	*	*	*	*	*	*		*	*	*
AB	Cotton	hulls	1-01-599	STMR	90	*	*	*	*	*	*	*		*	*	*
AB	Cotton	gin by-products	1-08-413	STMR	90	*	*	*	*	*	*	*		*	*	*
AB	Distiller's grain	dried	5-00-518	STMR	92	*	10	*	5	*	10	*		*	10	*
SO0693	Flaxseed/linseed	meal	5-02-043	STMR	88	20	10	*	*	20	10	*		20	10	*
AB0269	Grape	pomace, wet	2-02-206	STMR	15	*	*	*	*	*	*	*		*	*	20
AB	Lupin seed	meal	NA	STMR	85	*	10	20	*	*	10	20		*	10	*
VS0626	Palm	kernel meal	5-03-486	STMR	90	*	*	*	*	*	*	*		*	5	10
SO0697	Peanut	meal	5-03-649	STMR	85	25	10	10	*	25	10	10		25	10	*
AB	Pineapple	process waste	NA	STMR	25	*	*	*	*	*	*	*		*	*	*
AB	Potato	process waste	4-03-777	STMR	12	*	*	*	*	*	*	*		*	*	*
AB	Potato	dried pulp	4-03-775	STMR	88	*	20	*	*	*	15	*		*	*	5
AB	Rape	meal	5-26-093	STMR	88	*	*	5	5	*	10	5		*	20	*
AB	Rice	hulls	1-08-075	STMR	90	*	*	*	*	*	*	*	*	*	*	20
CM	Rice	bran/ pollard	4-03-928	STMR	90	10	10	20	5	10	5	20	20	10	*	15
SN	Sesame seed	meal	NA	STMR	90								5			
SM	Safflower	meal	5-26-095	STMR	91	25	10	15	*	25	5	15	*	25	5	*
AB	Sorghum, grain	asp gr fn	NA	STMR	85	*	*	*	*	*	*	*	*	*	*	*
AB	Soybean	asp gr fn	NA	STMR	85	*	*	*	*	*	*	*	*	*	*	25
AB	Soybean	meal	5-20-638	STMR	92	25	40	25	35	25	25	25	30	25	45	*
AB	Soybean	hulls	1-04-560	STMR	90	*	10	5	*	*	5	5	*	*	*	*
AB	Soybean	okara	NA	STMR	20											
AB	Soybean	pollard	NA	STMR	?	*	*	*	*	*	*	*	*	*	*	*
AB	Sugarcane	molasses	4-13-251	STMR	75	*	*	*	*	*	*	*	*	*	*	*
AB	Sugarcane	bagasse	1-04-686	STMR	32	*	*	*	*	*	*	*	*	*	*	15

Codex code	CROP	Feedstuff	IFN Code	Residue Level	DM (%)	POULTRY, BROILER				POULTRY, LAYER				TURKEY		
						US CAN	EU	AU	JP	US CAN	EU	AU	JP	US CAN	EU	AU
	Body weight (kg)					2	1.7	2	3	1.9	1.9	2	2	8	7	2
	Daily intake (DM in kg)					0.16	0.12	0.15	N/A	0.12	0.13	0.15	0.10	0.50	0.50	0.15
AB	Sunflower	meal	5-26-098	STMR	92	25	10	15	*	25	10	15	*	25	10	*
AB	Tomato	pomace, wet	NA	STMR	20											
AB	Wheat	asp gr fn	NA	STMR	85	*	*	*	*	*	*	*	*	*	*	20
AB	Wheat gluten	meal	5-05-221	STMR	40	*	10	*	*	*	10	*	*	*	10	10
AB	Wheat	milled bypdts	4-06-749	STMR	88	50	20	20	5	50	20	20	30	50	20	20

Table IX. 4 Percent of sheep diet

						RAM/EWE			LAMB			SWINE, breading			SWINE, finishing			
	CROP	Feedstuff	IFN Code	Residue Level	DM (%)	US CAN	EU	AU	US CAN	EU	AU	US CAN	EU	AU	US CAN	EU	AU	JP
	Body weight (kg)					85	75	60	40	40	60	270	260	60	100	100	60	110
	Daily intake (DM in kg)					2	2.5	2.5	1.5	1.7	2.5	2	6	2.5	3.1	3	2.50	1.00
	Forages																	
AL1020	Alfalfa	forage	2-00-196	HR	35	90	40	100	90	40	90	*	*	*	*	*	*	*
AL1021	Alfalfa	hay	1-00-054	HR	89	70	40	70	70	40	35	*	*	10	*	*	10	*
AF	Alfalfa	meal	1-00-023	HR	89	20	20	*	20	20	*	5	10	10	5	10	10	5
AF	Alfalfa	silage	3-08-150	HR	40	75	40	75	75	40	75	*	*	*	*	*	*	*
AF	Barley	forage	2-00-511	HR	30	70	50	100	30	50	100	*	*	*	*	*	*	*
AS0640	Barley	hay	1-00-495	HR	88	65	*	70	65	*	25	*	*	10	*	*	5	*
AS0641	Barley	straw	1-00-498	HR	89	25	60	30	25	60	30	*	*	10	*	*	10	*
AF	Barley	silage	NA	HR	40	*	50	*	*	50	*	*	*	*	*	*	*	*
AL1030	Bean	vines	2-14-388	HR	35	30	30	*	30	30	*	*	*	*	*	*	*	*
AV0569	Beet, mangel	fodder	2-00-632	HR	15	*	10	*	*	10	*	*	15	*	*	*	*	*
VR0596	Beet, sugar	tops	2-00-649	HR	23	15	20	*	20	20	*	*	10	*	*	*	*	*
VB0041	Cabbage	heads, leaves	2-01-046	HR	15	*	10	*	*	10	*	*	10	*	*	*	*	*
AL1023	Clover	forage	2-01-434	HR	30	85	85	100	30	30	100	*	20	*	*	*	*	*
AL1031	Clover	hay	1-01-415	HR	89	80	80	75	20	20	35	*	20	10	*	*	10	*
AF	Clover	silage	3-01-441	HR	30	85	85	75	30	30	75	*	20	*	*	*	*	*
AF0645	Corn, field	forage/ silage	3-28-345	HR	40	70	*	80	30	30	60	*	20	*	*	*	*	*
AS0645	Corn, field	stover	3-28-251	HR	83	50	*	*	25	*	*	*	20	*	*	*	*	*
AF	Corn, pop	stover	2-02-963	HR	85	25	*	*	25	*	*	*	20	*	*	*	*	*
AF	Corn, sweet	forage	1-08-407	HR	48	75	*	25	25	*	*	*	*	*	*	*	*	*
AF	Corn, sweet	stover	NA	HR	83	70	*	30	30	*	*	*	*	*	*	*	*	*
AF	Cowpea	forage	2-01-655	HR	30	75	35	100	30	35	100	*	20	*	*	*	*	*
AF	Cowpea	hay	1-01-645	HR	86	50	35	65	20	35	35	*	20	10	*	*	10	*
AF	Crown vetch	forage	2-19-834	HR	30	80	*	95	30	*	95	*	*	*	*	*	*	*
AF	Crown vetch	hay	1-20-803	HR	90	65	*	70	20	*	35	*	*	*	*	*	*	*
AF	Grass	forage (fresh)	2-02-260	HR	25	95	95	100	25	50	100	*	20	*	*	*	*	*
AF	Grass	hay	1-02-250	HR	88	90	90	70	15	30	25	*	20	10	*	*	10	*
AF	Grass	silage	3-02-222	HR	40	90	90	75	20	50	50	*	20	*	*	*	*	*
AV480	Kale	leaves	2-02-446	HR	15	*	10	*	*	10	*	*	10	*	*	*	*	*
AL1025	Lespedeza	forage	2-07-058	HR	22	80	*	*	30	*	*	*	*	*	*	10	*	*
AF	Lespedeza	hay	1-02-522	HR	88	70	*	20	20	*	*	*	*	*	*	10	*	*

						RAM/EWE			LAMB			SWINE, breading			SWINE, finishing			
	CROP	Feedstuff	IFN Code	Residue Level	DM (%)	US CAN	EU	AU	US CAN	EU	AU	US CAN	EU	AU	US CAN	EU	AU	JP
	Body weight (kg)					85	75	60	40	40	60	270	260	60	100	100	60	110
	Daily intake (DM in kg)					2	2.5	2.5	1.5	1.7	2.5	2	6	2.5	3.1	3	2.50	1.00
AF	Millet	forage	2-03-801	HR	30	80	*	100	35	*	60	*	*	*	*	*	*	*
AF	Millet	hay	1-03-119	HR	85	75	*	65	20	*	20	*	*	10	*	*	10	*
AS0646	Millet	straw	1-23-802	HR	90	50	*	35	15	*	15	*	*	10	*	*	10	*
AF0647	Oat	forage	2-03-292	HR	30	25	40	100	35	40	100	*	20	*	*	*	*	*
AS0647	Oat	hay	1-03-280	HR	90	80	40	65	20	40	20	*	20	10	*	*	10	*
AF	Oat	straw	1-03-283	HR	90	10	40	35	20	40	15	*	*	10	*	*	10	*
AF	Oat	silage	3-03-298	HR	35	*	*	*	*	*	*	*	*	*	*	*	*	*
AL0528	Pea	vines	3-03-596	HR	25	75	20	90	35	20	90	*	20	*	*	*	*	*
AL0072	Pea	hay	1-03-572	HR	88	75	20	70	25	20	30	*	20	15	*	*	10	*
AF	Pea	silage	3-03-590	HR	40	73	20	75	35	20	70	*	20	*	*	*	*	*
AL0697	Peanut	hay	1-03-619	HR	85	79	*	25	25	*	*	*	*	*	*	*	*	*
VL0495	Rape	forage	2-03-867	HR	30	50	40	90	30	40	90	*	20	*	*	*	*	*
AS0649	Rice	straw	1-03-925	HR	90	10	10	20	10	10	15	*	*	10	*	*	10	*
AF	Rice	whole crop silage		HR	40													
AF0650	Rye	forage	2-04-018	HR	30	75	40	100	30	40	100	*	20	*	*	*	*	*
AS0650	Rye	straw	1-04-007	HR	88	25	40	20	10	40	20	*	*	*	*	*	*	*
AF	Rye	silage		HR	28													
AF0651	Sorghum,forage	see Grasses																
	Sorghum, grain	forage	2-04-317	HR	35	30	20	100	30	20	65	*	20	10	*	*	*	*
AS	Sorghum, grain	stover	1-07-960	HR	88	30	20	*	20	20	*	*	20	*	*	*	*	*
AF	Sorghum, grain	silage		HR	21													
AL1265	Soybean	forage	2-04-574	HR	56	80	*	90	35	*	80	*	*	*	*	*	*	*
AL0541	Soybean	hay	1-04-558	HR	85	65	*	70	20	*	25	*	*	*	*	*	*	*
AF	Soybean	silage	3-04-581	HR	30	70	*	75	40	*	65	*	*	*	*	*	*	*
AF	Sugarcane	tops	2-04-692	HR	25	*	*	*	*	*	*	*	*	*	*	*	*	*
AL	Trefoil	forage	2-20-786	HR	30	75	40	90	35	20	90	*	20	*	*	*	*	*
AF	Trefoil	hay	1-05-044	HR	85	60	40	70	25	20	70	*	20	15	*	*	10	*
AF	Triticale	forage	2-02-647	HR	30	60	40	100	30	30	100	*	20	*	*	*	*	*
AF	Triticale	hay	NA	HR	88	80	40	70	20	20	25	*	20	10	*	*	10	*
AF	Triticale	straw	NA	HR	90	10	40	20	10	10	15	*	*	10	*	*	10	*
AF	Triticale	silage	3-26-208	HR	35	30	*	*	25	*	*	*	*	*	*	*	*	*
AV0506	Turnip	tops (leaves)	2-05-063	HR	30	65	30	75	20	30	75	*	*	*	*	*	*	*
AF	Vetch	forage	2-05-112	HR	30	80	30	100	30	20	100	*	*	10	*	*	*	*
AF	Vetch	hay	1-05-122	HR	85	75	30	75	20	20	30	*	*	10	*	*	10	*
AF	Vetch	silage	3-26-357	HR	30	80	*	*	30	*	*	*	*	*	*	*	*	*
AF	Wheat	forage	2-08-078	HR	25	75	40	100	30	30	100	*	20	10	*	*	*	*
AS0654	Wheat	hay	1-05-172	HR	88	80	40	65	20	20	25	*	20	10	*	*	10	*

						RAM/EWE			LAMB			SWINE, breading			SWINE, finishing			
	CROP	Feedstuff	IFN Code	Residue Level	DM (%)	US CAN	EU	AU	US CAN	EU	AU	US CAN	EU	AU	US CAN	EU	AU	JP
	Body weight (kg)					85	75	60	40	40	60	270	260	60	100	100	60	110
	Daily intake (DM in kg)					2	2.5	2.5	1.5	1.7	2.5	2	6	2.5	3.1	3	2.50	1.00
AS0654	Wheat	straw	1-05-175	HR	88	25	40	20	10	40	15	*	*	10	*	*	10	*
AF	Wheat	silage	3-05-186	HR	30	30	*	*	25	*	*	*	*	*	*	*	*	*
	Roots & Tubers																	
VR0577	Carrot	culls	2-01-146	HR	12	20	20	*	40	20	*	*	25	10	*	25	5	*
VR0463	Cassava/tapioca	roots	2-01-156	HR	37	*	20	*	*	20	*	*	40	*	*	40	*	*
VR0589	Potato	culls	4-03-787	HR	20	50	30	*	40	20	*	*	50	10	*	50	*	*
VR0497	Swede	roots	4-04-001	HR	10	*	30	80	*	30	80	*	40	5	*	40	*	*
VR506	Turnip	roots	4-05-067	HR	15	75	30	80	75	30	80	*	40	5	*	40	5	*
	Cereal Grains/Crops Seeds																	
GC0640	Barley	grain	4-00-549	HR	88	40	40	85	40	60	85	20	80	85	20	80	80	30
VD0071	Bean	seed	4-00-515	HR	88	20	20	85	20	20	85	*	20	20	*	20	20	*
GC0645	Corn, field	grain	4-20-698	HR	88	50	30	85	50	30	85	85	70	80	85	70	80	85
GC0656	Corn, pop	grain	4-02-964	HR	88	50	30	85	50	30	85	*	*	*	*	*	*	*
VG0527	Cowpea	seed	5-01-661	HR	88	*	20	75	*	20	75	10	10	10	10	20	10	*
VD0545	Lupin	seed	5-02-707	HR	88	*	10	100	*	10	100	*	15	25	*	20	25	*
GC0646	Millet	grain	4-03-120	HR	88	40	30	*	40	30	*	20	70	70	20	70	70	*
GC0647	Oat	grain	4-03-309	HR	89	*	40	90	*	60	90	*	70	80	*	70	80	*
VD0561	Pea	seed	5-03-600	HR	90	20	20	*	20	20	*	15	20	40	15	20	40	*
GC0649	Rice	grain	4-03-939	HR	88	20	*	*	20	*	*	20	*	60	20	*	65	*
GC0650	Rye	grain	4-04-047	HR	88	20	40	*	20	45	*	*	70	80	*	70	70	35
GC0651	Sorghum, grain	grain	4-04-383	HR	86	40	40	80	50	40	80	80	70	80	80	70	80	55
SO4724 VD4521	Soybean	seed	5-64-610	HR	89	25	10	40	15	20	40	15	10	10	15	20	10	*
GC0653	Triticale	grain	4-20-362	HR	89	20	30	85	20	40	85	*	60	80	*	60	80	*
AL1029	Vetch	seed	5-26-351	HR	89	*	*	*	*	*	*	*	*	10	*	*	10	*
GC0654	Wheat	grain	4-05-211	HR	89	20	40	80	20	60	80	*	70	80	*	70	80	35
	By-products																	
AM 0660	Almond	hulls	4-00-359	STMR	90	*	*	*	*	*	*	*	*	*	*	*	*	*
AB9226	Apple	pomace, wet	4-00-419	STMR	40	10	10	*	10	10	*	*	*	*	*	*	*	*
AB	Barley	bran fractions		STMR	90													
AB0596	Beet, sugar	dried pulp	4-29-307	STMR	88	15	40	*	20	40	*	*	20	*	*	20	*	*
AB	Beet, sugar	ensiled pulp	4-00-662	STMR	15	*	*	*	*	*	*	*	*	*	*	*	*	*
DM0596	Beet, sugar	molasses	4-30-289	STMR	75	15	5	*	10	5	*	*	5	*	*	5	*	*
AB	Brewer's grain	dried	5-00-516	STMR	92	70	30	*	40	10	*	*	10	10	*	10	10	*
AB	Canola	meal	5-08-136	STMR	88	15	*	35	15	*	35	15	20	20	15	20	20	*
AB001	Citrus	dried pulp	4-01-237	STMR	91	20	*	*	15	*	*	*	15	10	*	*	10	*

						RAM/EWE			LAMB			SWINE, breading			SWINE, finishing			
	CROP	Feedstuff	IFN Code	Residue Level	DM (%)	US CAN	EU	AU	US CAN	EU	AU	US CAN	EU	AU	US CAN	EU	AU	JP
	Body weight (kg)					85	75	60	40	40	60	270	260	60	100	100	60	110
	Daily intake (DM in kg)					2	2.5	2.5	1.5	1.7	2.5	2	6	2.5	3.1	3	2.50	1.00
SM	Coconut	meal	5-01-572	STMR	91	*	20	35	*	20	35	*	*	10	*	*	10	*
AB	Corn, field	asp gr fn	4-02-880	STMR	85	*	*	*	*	*	*	*	*	*	*	*	*	*
AB	Corn, field	milled bypdts	5-28-235	STMR	85	35	30	*	50	30	*	60	75	70	60	75	70	*
AB	Corn, field	hominy meal	4-03-010	STMR	88	50	*	*	50	*	*	20	*	40	20	*	40	*
AB	Corn, sweet	cannery waste	2-02-875	STMR	30	30	*	*	20	*	*	*	*	*	*	*	*	*
AB	Corn gluten	feed	5-28-243	STMR	40	35	30	80	50	30	80	20	20	20	20	20	20	10
AB	Corn gluten	meal	5-28-242	STMR	40	35	30	*	50	30	*	20	10	25	20	10	25	5
AB	Cotton	meal	5-01-617	STMR	89	15	15	45	10	10	45	15	10	10	15	5	10	*
AB	Cotton	undelinted seed	5-01-614	STMR	88	25	*	25	25	*	25	*	*	*	*	*	*	*
AB	Cotton	hulls	1-01-599	STMR	90	15	*	20	20	*	20	*	*	*	*	*	*	*
AB	Cotton	gin by-products	1-08-413	STMR	90	*	*	*	*	*	*	*	*	*	*	*	*	*
AB	Distiller's grain	dried	5-00-518	STMR	92	35	10	*	25	10	*	*	20	20	*	20	20	*
SO0693	Flaxseed/linseed	meal	5-02-043	STMR	88	15	20	*	20	10	*	10	20	10	10	20	10	*
AB0269	Grape	pomace, wet	2-02-206	STMR	15	*	*	*	*	*	*	*	*	10	*	*	10	*
AB	Lupin seed	meal	NA	STMR	85	*	25	*	*	20	*	*	10	25	*	10	25	*
VS0626	Palm	kernel meal	5-03-486	STMR	90	*	*	*	*	*	*	*	10	10	*	10	10	15
SO0697	Peanut	meal	5-03-649	STMR	85	20	20	*	15	20	*	15	20	10	15	20	10	*
AB	Pineapple	process waste	NA	STMR	25	*	*	*	*	*	*	*	*	*	*	*	*	*
AB	Potato	process waste	4-03-777	STMR	12	50	40	*	25	20	*	*	20	*	*	*	*	*
AB	Potato	dried pulp	4-03-775	STMR	88	*	40	*	*	20	*	*	10	*	*	20	*	*
AB	Rape	meal	5-26-093	STMR	88	15	15	*	15	15	*	*	10	15	*	20	15	20
AB	Rice	hulls	1-08-075	STMR	90	20	*	20	10	*	15	*	*	10	*	0	10	*
CM	Rice	bran/ pollard	4-03-928	STMR	90	*	30	*	*	30	*	10	10	30	10	0	20	10
SN	Sesame seed	meal	NA	STMR	90													
SM	Safflower	meal	5-26-095	STMR	91	15	*	*	15	*	*	15	*	20	15	*	20	*
AB	Sorghum, grain	asp gr fn	NA	STMR	85	*	*	*	*	*	*	*	*	*	*	*	*	*
AB	Soybean	asp gr fn	NA	STMR	85	*	*	*	*	*	*	*	*	*	*	*	*	*
AB	Soybean	meal	5-20-638	STMR	92	25	25	35	15	25	35	15	30	30	15	30	30	*
AB	Soybean	hulls	1-04-560	STMR	90	50	*	20	20	*	20	*	*	10	*	*	10	*
AB	Soybean	okara	NA	STMR	20													

						RAM/EWE			LAMB			SWINE, breading			SWINE, finishing			
	CROP	Feedstuff	IFN Code	Residue Level	DM (%)	US CAN	EU	AU	US CAN	EU	AU	US CAN	EU	AU	US CAN	EU	AU	JP
	Body weight (kg)					85	75	60	40	40	60	270	260	60	100	100	60	110
	Daily intake (DM in kg)					2	2.5	2.5	1.5	1.7	2.5	2	6	2.5	3.1	3	2.50	1.00
AB	Soybean	pollard	NA	STMR	?	*	*	*	*	*	*	*	*	*	*	*	*	*
AB	Sugarcane	molasses	4-13-251	STMR	75	10	5	10	10	5	10	*	*	*	*	*	*	*
AB	Sugarcane	bagasse	1-04-686	STMR	32	*	*	10	*	*	*	*	*	*	*	*	*	*
AB	Sunflower	meal	5-26-098	STMR	92	20	20	40	20	20	40	15	10	30	15	10	30	*
AB	Tomato	pomace, wet	NA	STMR	20													
AB	Wheat	asp gr fn	NA	STMR	85	*	*	*	*	*	*	*	*	*	*	*	*	*
AB	Wheat gluten	meal	5-05-221	STMR	40	10	30	*	10	30	*	10	10	25	10	10	25	*
AB	Wheat	milled bypdts	4-06-749	STMR	88	40	40	*	50	50	*	50	50	40	50	50	40	15

Notes:

Percent DM. (Percent dry matter) for beef, dairy, and sheep feedstuffs, the percent moisture should be reported for representative samples of raw agricultural and processed commodities.

Classification of Feedstuff. R**:** roughage; **CC:** carbohydrate concentrate; **PC:** protein concentrate.

Residue Level. HR: Highest Residue (or HAFT); **STMR:** Supervised Trial Median Residue.

Percent DM. Percent dry matter. For beef, dairy, and sheep feedstuffs, the percent moisture should be reported for representative samples of raw agricultural and processed commodities.

***** Indicates that item is not used or is a minor feedstuff (less than 5 percent of livestock diet).

Percent of Livestock Diet. Percentages of feedstuffs in livestock daily rations for mature and marketable animals are best estimates based upon production data of livestock meat, milk, and eggs for human consumption. Percent of diet is based on a dry weight basis for beef and dairy cattle, sheep, and on an as-fed basis for poultry and swine. The reference animals used for the table values are based on the listed body weights and daily dry matter intake. The following reference animals were used:

United States/Canada

Beef: Finishing, body weight of 500 kg, consuming 9.1 kg of daily dry matter feed. *Dairy:* mature cows, body weight of 600 kg, producing 23 kg of milk a day, consuming 18.2 kg of daily dry matter feed.

Ram/Ewe: breeding, body weight of 85 kg, consuming 2.0 kg of daily dry matter feed. *Fattened Lamb*, finishing, body weight of 40 kg, consuming 1.5 kg of daily dry matter feed.

Boar/Sow, breeding, body weight of 270 kg, consuming 2.0 kg of daily dry matter feed. *Finishing Hog*, body weight of 100 kg, consuming 3.1 kg of daily dry matter feed.

Broiler, body weight of 2.5 kg, consuming 0.16 kg of daily dry matter feed. *Layer:* body weight of 3.2 kg, consuming 0.12 kg of daily dry matter feed.

Turkey: body weight of 12 kg, consuming 0.5 kg of daily dry matter feed.

European Union

Beef: Finishing, body weight of 500 kg, consuming 10 kg of daily dry matter feed. *Dairy:* mature cows, body weight of 650 kg, producing 40 kg of milk a day, consuming 25 kg of daily dry matter feed.

Ram/Ewe: breeding, body weight of 75 kg, consuming 2.5 kg of daily dry matter feed. *Fattened Lamb*, finishing, body weight of 40 kg, consuming 1.7 kg of daily dry matter feed.

Boar/Sow, breeding, body weight of 260 kg, consuming 2.0 kg of daily dry matter feed. *Finishing Hog*, body weight of 100 kg, consuming 3 kg of daily dry matter feed.

Broiler, body weight of 1.7 kg, consuming 0.12 kg of daily dry matter feed. *Layer:* body weight of 1.9 kg, consuming 0.13 kg of daily dry matter feed.

Turkey: body weight of 20 kg, consuming 0.7 kg of daily dry matter feed.

Australia

Beef: Finishing, body weight of 400 kg, consuming 9.1 kg of daily dry matter feed. *Dairy:* mature cows, body weight of 600 kg, producing 23 kg of milk a day, consuming 18.2 kg of daily dry matter feed.

Ram/Ewe: breeding, body weight of 85 kg, consuming 2.0 kg of daily dry matter feed. *Fattened Lamb*, finishing, body weight of 40 kg, consuming 1.5 kg of daily dry matter feed.

Boar/Sow, breeding, body weight of 270 kg, consuming 2.0 kg of daily dry matter feed. *Finishing Hog*, body weight of 100 kg, consuming 3.1 kg of daily dry matter feed.

Broiler, body weight of 2.5 kg, consuming 0.16 kg of daily dry matter feed. *Layer:* body weight of 3.2 kg, consuming 0.12 kg of daily dry matter feed.

Turkey: body weight of 12 kg, consuming 0.5 kg of daily dry matter feed.

FORAGES

Alfalfa. Residue data are needed from a minimum of three cuttings, unless climatic conditions restrict the number of cuttings. Cut sample at late bud to early bloom stage (first cut), and/or at early (one-tenth) bloom stage (later cuts). **Alfalfa meal (17% protein).** Residue data are not needed for meal; however, the meal should be included in the livestock diet, using the hay MRL. **Alfalfa hay** should be field-dried to a moisture content of 10 to 20%. **Alfalfa silage.** Residue data on silage are optional, but are desirable for assessment of dietary exposure. Cut at late bud to one-tenth bloom stage for alfalfa, allow to wilt to approximately 60% moisture, then chop fine, pack tight, and allow to ferment for three weeks maximum in an air-tight environment until it reaches pH 4. This applies to both silage and haylage. In the absence of silage data, residues in forage will be used for silage, with correction for dry matter.

Barley hay. Cut when the grain is in the milk to soft dough stage. Hay should be field-dried to a moisture content of 10 to 20%.

Barley straw. Plant residue (dried stalks or stems with leaves) left after the grain has been harvested (threshed).

Barley silage. Residue data on silage are optional, but are desirable for assessment of dietary exposure. Cut sample at boot to early head stage, allow to wilt to 55 to 65% moisture, then chop fine, pack tight, and allow to ferment for three weeks maximum in an air-tight environment until it reaches pH 4. In the absence of silage data, residues in forage will be used for silage, with correction for dry matter.

Beet, sugar, tops. Based on current US agricultural practices, tops are fed only to grazing beef cattle and sheep. Other countries may feed differently.

Cabbage. Heads, fresh.

Clover forage. Cut sample at the 10-20 cm (4-8 inch) to pre-bloom stage, at approximately 30% DM.

Clover hay. Cut at early to full bloom stage. Hay should be field-dried to a moisture content of 10 to 20%. Residue data for clover seeds are not needed.

Clover silage. Residue data on silage are optional, but are desirable for assessment of dietary exposure. Cut sample at early to one-fourth bloom stage for clover, allow to wilt to approximately 60% moisture, then chop fine, pack tight, and allow to ferment for three weeks maximum in an air-tight environment until it reaches pH 4. This applies to both silage and haylage. In the absence of silage data, residues in forage will be used for silage, with correction for dry matter. IFN codes are given for most commonly used red clover.

Corn forage (field and pop). Cut sample (whole aerial portion of the plant) at late dough/early dent stage (black ring/layer stage for corn only).

Corn stover (field and pop). Mature dried stalks from which the grain or whole ear (cob + grain) have been removed; contains 80 to 85% DM.

Corn silage (field and pop). Freshly cut samples may be analysed or ensiled samples after ensiling for three weeks maximum, and reaching pH 5 or less, with correction for percent dry matter.

Corn forage (sweet). Samples should be taken when sweet corn is normally harvested for fresh market, and may or may not include the ears. Freshly cut samples may be analysed or ensiled samples after ensiling for three weeks maximum, and reaching pH 5 or less, with correction for percent dry matter.

Cowpea forage. Cut sample at 15 cm (6 inch) to pre-bloom stage, at approximately 30% DM.

Cowpea hay. Cut when pods are one-half to fully mature. Hay should be field-dried to a moisture content of 10 to 20%.

Crownvetch forage. Cut sample at 15 cm (6 inch) to pre-bloom stage, at approximately 30% DM.

Crownvetch hay. Cut at full bloom stage. Hay should be field-dried to a moisture content of 10 to 20 percent.

Grass. Zero day crop field residue data for grasses cut for forage should be provided unless it is not feasible, e.g., pre-plant/pre-emergent pesticide uses. A reasonable interval before cutting for hay is allowed. Grasses include barnyard grass, bent grass, Bermuda grass, Kentucky bluegrass, big bluestem, smooth brome grass, buffalo grass, reed canary grass, crabgrass, cup grass, dallies grass, sand dropseed, meadow foxtail, eastern grama grass, side-oats grama, guinea grass, Indian grass, Johnson grass, love grass, napier grass, oat grass, orchard grass, pangola grass, redtop, Italian ryegrass, sprangletop, squirreltail grass, stargrass, switch grass, timothy, crested wheatgrass, and wild ryegrass. Also included are Sudan grass and sorghum forages and their hybrids.

Grass forage. Cut sample at 15-20 cm (6-8 inch) to boot stage, at approximately 25% DM.

Grass hay. Cut in boot to early head stage. Hay should be field-dried to a moisture content of 10 to 20%. Included are Sudan grass and sorghum forages and their hybrids. For grass grown for seed only, PGIs (pre-grazing interval) and PHIs (pre-harvest interval) are acceptable. Residue data may be harvesting the seed.

Grass silage. Residue data on silage are optional, but are desirable for assessment of dietary exposure. Cut sample at boot to early head stage, allow to wilt to 55 to 65% moisture, then chop fine, pack tight, and allow to ferment for three weeks maximum in an air-tight environment until it reaches pH 4. In the absence of silage data, residues in forage will be used for silage, with correction for dry matter. For the three grass feed types in Japan, the listed values are the highest of percentages of Italian rye grass, orchard grass and timothy in diet for beef cattle and dairy cattle..

Kale Leaves, fresh

Lespedeza forage. Cut sample at 10-15 cm (4-6 inch) to pre-bloom stage, at 20 to 25% DM.

Lespedeza hay. Annual/Korean. Cut at early blossom to full bloom stage. Sericea. Cut when 30-37.5 cm (12-15 inches) tall. Hay should be field-dried to a moisture content of 10 to 20%.

Millet forage. Cut sample at 10 inch to early boot stage, at approximately 30% DM.

Millet hay. Cut at early boot stage or approximately 1 m (40 inches) tall, whichever is reached first. Hay should be field-dried to a moisture content of 10 to 20%. Millet includes pearl millet.

Millet straw. Data are required for proso millet only:

Proso millet straw. Plant residue (dried stalks or stems with leaves) left after the grain has been harvested.

Oats forage. Cut sample between tillering to stem elongation (jointing) stage.

Oats hay. Cut sample from early lower to soft dough stage. Hay should be field-dried to a moisture content of 10 to 20%.

Oats straw. Cut plant residue (dried stalks or stems with leaves) left after the grain has been harvested (threshed).

Pea, field. Does not include the canning field pea cultivars used for human food. It includes cultivars grown for livestock feeding only such as `Austrian winter pea'.

Field pea vines. Cut sample anytime after pods begin to form, at approximately 25% DM.

Field pea hay. Succulent plant cut from full bloom thru pod formation. Hay should be field-dried to a moisture content of 10 to 20%.

Pea, field, silage. Use field pea vine residue data for field pea silage, with correction for dry matter.

Peanut hay. Peanut hay consists of the dried vines and leaves left after the mechanical harvesting of peanuts from vines that have been sun-dried to a moisture content of 10 to 20%.

Rice straw. Stubble (basal portion of the stems) left standing after harvesting the grain. In Japan, the maximum fed to cattle destined for human consumption is limited to 20% on a wet weight basis by a regulation, and the maximum fed to lactating cows is limited to 20% on a wet basis by a regulation.

Rye forage. Cut sample at 15-20 cm (6-8 inch) stage to stem elongation (jointing) stage, at approximately 30% DM.

Rye straw. Cut plant residue (dried stalks or stems with leaves) left after the grain has been harvested (threshed).

Sorghum forage. Cut sample (whole aerial portion of the plant) at soft dough to hard dough stage. Forage samples should be analysed as is, or may be analysed after ensiling for three weeks maximum, and reaching pH 5 or less, with correction for dry matter.

Sorghum stover. Mature dried stalks from which the grain have been removed; contains approximately 85% DM.

Soybean forage. Cut samples at 15-20 cm (6-8 inches) tall (sixth node) to beginning pod formation, at approximately 35% DM.

Soybean hay. Cut samples at mid-to-full bloom and before bottom leaves begin to fall or when pods are approximately 50% developed. Hay should be field-dried to a moisture content of 10 to 20%.

Soybean silage. Residue data on silage are optional. Harvest sample when pods are one-half to fully mature (full pod stage). In the absence of silage data, residues in forage will be used for silage, with correction for dry matter.

Trefoil forage. Cut sample at 12.5-25 cm (5-10 inch) or early bloom stage, at approximately 30% DM.

Trefoil hay. Cut at first flower to full bloom. Hay should be field-dried to a moisture content of 10 to 20%.

Triticale. See wheat.

Vetch forage. Cut sample at 15 cm (6 inch) to pre-bloom stage, at approximately 30% DM.

Vetch hay. Cut at early bloom stage to when seeds in the lower half of the plant are approximately 50% developed. Hay should be field-dried to a moisture content of 10 to 20%. Vetch does not include crown vetch.

Wheat. Includes emmer wheat and triticale. No processing study is needed for a specific MRL on emmer wheat.

Wheat forage. Cut sample at 15-20 cm (6-8 inch) stage to stem elongation (jointing) stage, at approximately 25% DM.

Wheat hay. Cut samples at early flower (boot) to soft dough stage. Hay should be field-dried to a moisture content of 10 to 20%.

Wheat straw. Cut plant residue (dried stalks or stems with leaves) left after the grain has been harvested (threshed).

ROOTS & TUBERS

Carrot culls. Residue data for the raw agricultural commodity will cover residues on culls.

Cassava/tapioca roots. The whole root chipped mechanically into small pieces, then dried, and the dried chips pelted.

Potato culls. Whole unpeeled potato not suited for fresh market or processing.

CEREAL GRAINS/CROP SEEDS

Barley or oat grain. Residue data are needed for kernel (caryopsis) with hull (lemma and palea).

Bean, cowpea, lupin, pea, soybean, vetch seed. Residue data are needed for mature, dried seed.

Corn grain (field and pop). Residue data are needed for mature kernel (caryopsis) with cob removed.

Millet grain. Residue data are needed for kernel plus hull (lemma and palea).

Pearl millet grain. Residue data are needed for kernel with hull (lemma and palea) removed

Rice grain. Residue data are needed for kernel (caryopsis) either with hull or without hull. Registrant should contact appropriate regulatory agency for their specific data needs for rice grain.

Rye, triticale, sorghum (grain), or wheat grain. Residue data are needed for kernel (caryopsis) with hull (lemma and palea) removed.

BY-PRODUCTS

General. In the US, no more than one by-product (almond hulls, apple pomace, aspirated grain fractions, carrot culls, citrus pulp, sweet corn cannery waste, cotton gin byproducts, pineapple process waste, potato culls and potato processing waste) would be included in a diet.

Almond hulls. Dried pericarp which surrounds the nut.

Apple pomace, wet. By-product of the apple processing industry which remains after cider has been expressed from small whole apples, and the stems, cores, and peelings remaining after preparation of apple juice and sauce for human consumption.

Aspirated grain fractions ("**grain dust**"). Dust collected at grain elevators during the moving/handling of grains/oilseeds for environmental and safety reasons.

Residue data should be provided for any postharvest use on corn, sorghum, soybeans or wheat. For a pre-harvest use after the reproduction stage begins and seed heads are formed, data are needed unless residues in the grain are less than the limit of quantification of the analytical method. For a pre-harvest use during the vegetative stage (before the reproduction stage begins), data will not normally be needed unless the plant metabolism or processing study shows a concentration of residues of regulatory concern in an outer seed coat, e.g., wheat bran, soya bean hulls. If a MRL is needed, then it should be set at the higher of the residues found in the aspirated grain fraction of corn, sorghum, soybean, or wheat.

Beet, sugar. dried pulp. Dried material remaining from sugar beets which have been cleaned and freed from crowns, leaves, and sand and to which has been extracted in the process of manufacturing sugar. Moisture content should be defined.

Beet, sugar, molasses. The by-product of the manufacture of sucrose from sugar beets, and contains not less than 48% total sugars expresses as invert and its density determined by double dilution must not be less than 79.5 Brix.

Brewer's grains. Dried extracted residue of barley malt alone or in a mixture with other cereal grain or cereal products resulting from the manufacture of wort or beer and may contain pulverized dried spent hops in an amount not to exceed 3%, evenly distributed. Moisture content should be defined.

Canola meal. Meal obtained after the removal of most of the oil by direct solvent or prepress solvent extraction process.

Citrus, dried pulp. It is the ground peel, residue of the inside portions, and occasional fruits of the citrus family which have been dried, producing a coarse, flaky product. It may contain dried citrus meal or pellets and whole citrus seeds.

Coconut meal. It is the ground residue which remains after removal of most of the oil from dried meat of coconut by a mechanical or solvent extraction process.

Corn (field) milled byproducts. (Dry milled: grits, meal, flour and refined oil). If a MRL is needed for dry-milled processed commodities, then it should be set at the highest concentration for grits, meal, and flour.

Corn (field). Hominy meal. A mixture of corn bran, germ, and part of starchy portion of corn kernels as produced in making of pearl hominy, hominy grits, or table meal (< 4% fat).

Corn gluten feed. Part of the commercial shelled corn that remains after the extraction of the larger portion of the starch, gluten, and germ by the processes employed in wet milling of field corn.

Corn gluten meal. It is the dried residue from corn after the removal of the larger portion of the starch and germ, and the separation of the bran by the process employed in wet milling of field corn.

Corn, sweet. Residue data on early sampled field corn should suffice to provide residue data on sweet corn, provided the residue data are generated at the milk stage on kernel plus cob with husk removed and there are adequate numbers of trials and geographical representation from the sweet corn growing regions.

Corn (sweet) cannery waste. It includes husks, leaves, cobs, and kernels. Residue data for forage will be used for sweet corn cannery waste.

Cotton meal. Material obtained by finely grinding the cake which remains after removal of most of the oil from the cottonseed either by a mechanical or solvent extraction process.

Cotton undelinted seed. Whole seed removed in the ginning process and still has fine cotton fibres attached.

Cotton hulls. It consists primarily of the outer covering of the harvested cottonseed.

Cotton gin byproducts (commonly called gin trash). Include the plant residues from ginning cotton, and consist of burrs, leaves, stems, lint, immature seeds, and sand and/or dirt. Cotton must be harvested by commercial equipment to provide an adequate representation of plant residue for the ginning process. Two field trials for harvesting of stripper cotton are needed. No data are needed for picker cotton.

Distiller's grains. The material obtained after distillation of ethyl alcohol from grain or grain mixture which has under gone yeast fermentation. Moisture content should be defined.

Flaxseed/linseed meal. The ground residue which remains after removal of most of the oil from the whole flaxseed by a mechanical or solvent extraction process.

Grape pomace, wet. Wet debris left behind after fruit have been pressed for juice, also called "marc". Moisture content should be defined.

Lupin seed meal The ground residue which remains after removal of most of the oil from the whole lupin seed by a mechanical or solvent extraction process.

Palm kernel meal. It is the ground residue which remains after removal of most of the oil from the whole palm kernel by a mechanical or solvent extraction process.

Peanut meal, It is the ground residue which remains after removal of most of the oil from the shelled nut by a mechanical or solvent extraction process.

Pineapple process residue (also known as wet bran). A wet waste by-product from the fresh-cut product line that includes pineapple tops (minus crown), bottoms, peels, any trimmings with peel cut up, and the pulp (left after squeezing for juice); it can include culls.

Potato dried pulp. Dried processed potato waste. See processed potato waste.

Processed potato waste. (including wet and dry peel, raw chip, French fries, and cooked potatoes). MRLs for wet peel should be used for dietary burden calculations. Residue data may be provided from actual processed potato waste generated using a pilot or commercial scale process that gives the highest percentage of wet peel in the waste.

Rapeseed meal. Residue data are not needed for rapeseed oil since it is produced for industrial uses and is not an edible oil. The edible oil is only produced from canola. (See canola).

Rice hulls. Consist primarily of the outer covering of the rice grain (with bran).

Safflower meal. It is the ground residue which remains after removal of most of the oil from the whole safflower seed by a mechanical or solvent extraction process.

Soya bean okara. Okara or soy pulp is a white or yellowish pulp consisting of insoluble parts of the soybean which remain in the filter sack when pureed soybeans are filtered in the production of soy milk. As a significant byproduct of soy milk and tofu manufacturing, okara is used as animal feed.

Soya bean meal. Material obtained by grinding the cake or chips which remain after the removal of most of the oil by solvent extraction process.

Sugarcane molasses. Residue data are needed for blackstrap molasses.

Sugarcane bagasse. US data indicates that sugarcane bagasse is mainly used for fuel. Other countries may use differently.

Sunflower meal. The ground residue which remains after removal of most of the oil from the whole sunflower seed by a mechanical or solvent extraction process.

Tomato pomace, wet. By-product of tomato paste production consisting mainly of skins and seeds.

Wheat milled byproducts. If a MRL is needed, then it should be set at the highest value for wheat middlings, bran and shorts.

Appendix X

JMPR MANUAL FOR FAO PANEL MEMBERS

CONTENTS

1. INTRODUCTION

The purpose of this manual is to assist members of the FAO Panel to prepare draft documents for the Meeting in a consistent format. It may also be useful to people preparing submissions for review by the FAO Panel. The manual is not intended to deal with the evaluation process or to provide guidance on the estimation of maximum residue levels. Documents prepared in the correct format assist JMPR members to digest information quickly, and after the Meeting make it easier for the editor to produce final copy for publication.

2. GENERAL

Produce documents on a word-processor using Word version Office 2003 or later.

Introduce continuous line numbering into all documents for discussion. Line numbers assist readers to find parts of the document to be discussed.

Spell-check documents, if possible, with English (UK).

Use metric units and convert non-metric units to metric.

Fahrenheit °F	°C= (°F-32)×5/9
feet^2	0.0929 m^2
1 lb =	0.4536 kg
1 gal (US) =	3.7854 litres
1 fl oz =	0.02957 litres
1 acre (A) =	0.404687 ha
fl oz/A	0.073069 L/ha
g/acre	2.470058 g/ha
100 sq ft =	9.290 sq m
1 lb/100 gal (US) =	0.1198 kg/hL
1 gpa =	9.353 L/ha (gpa is gallon per acre)
1 lb/acre =	1.1208 kg/ha
1 oz/1000 cu ft =	1.0012 g/m^3 (space fumigation)
1 quarts, US Liquid	0.946325 litre

Convert lb ai/acre to kg ai/ha, formulation concentration % to g/kg or g/L, residue concentration ppm to mg/kg, but express feed concentrations of active ingredients in feeding

trials as ppm. This convention is used to avoid confusion between mg/kg feed and mg/kg body weight.

3. FORMAT

Use Times New Roman font size 11 for text and at least size 9 for tables.

Left and right margins should be 1 inch (25 mm) and top and bottom margins 0.5 inch (12.5 mm). Lines should be fully justified, with widow/orphan protection.

Tabs for general text should be set at half-inch (12.5 mm) intervals.

Paragraphs immediately following a heading should be left aligned. The first line of subsequent paragraphs should be indented half-inch (12.5 mm).

A page header should be introduced on the top left of each page of the draft document to show the title of the document, for example: PHORATE Evaluation, or PHORATE Appraisal, or RESIDUES IN FEEDS Report.

Position page numbers at "Top of page (header)", and centred and use Times New Roman font size 12.

3.1 Tables

This section contains guidelines for creating tables. Examples of particular table layouts, e.g., residue data tables, are provided under the relevant headings in the section "A residue evaluation (draft monograph)."

Insert tables in their intended positions in the text or thereabouts, not at the end of the monograph.

Use the Table function in Word. Generally, separate items of information should be recorded in separate cells of tables. For example, the Codex Commodity Number and the Codex commodity description should be in separate cells of the row. In particular, ensure that separate lines of tables are in separate rows of cells.

Generally avoid the use of symbols and indicate endnotes to a table (at the end of the table rather than at the bottom of the page) by superscript letters.

Do not join cells vertically (as distinct from deleting lines separating them). This causes the same problems as cells that are several lines deep.

Use the portrait (vertical) rather than the landscape (horizontal) layout for tables as far as possible. Use the same page margins as stated above. Wide tables can be accommodated vertically by using font size 9.

Use the "Headings" function for multi-page tables to ensure that the table header appears at the top of each page. Do not include the table caption as a header within the table itself as the caption will appear on subsequent pages and thus make it difficult for the reader to find the beginning of a long table.

Do not construct a table covering several pages as a series of separate single-page tables. This usually produces a number of partly filled pages.

Avoid abbreviations if they make the table difficult to understand. If an abbreviation is unlikely to be familiar to readers and is not in the list of abbreviations at the beginning of the reports and evaluations, explain its meaning in a table endnote.

Common specialized abbreviations which do not need explanation are:

ARfD	acute reference dose
ADI	acceptable daily intake
CAC	Codex Alimentarius Commission
CAS	Chemical Abstracts Service
CCPR	Codex Committee on Pesticide Residues
CXL	Codex MRL
ECD	Electron capture detector
EMRL	extraneous maximum residue limit
FPD	Flame photometric detector
g ai/m	grams active ingredient per metre
g ai/m^3	grams active ingredient per cubic metre
g ai/t	grams active ingredient per tonne
GAP	good agricultural practice(s)
GC-MS(MS)	Gas chromatograph coupled with mass detector
HR	highest residue in the edible portion of the commodity found in the trials used to estimate a maximum residue level in the commodity
HR-P	residue in a processed commodity calculated by multiplying the HR of the raw agricultural commodity by the corresponding processing factor
IEDI	international estimated daily intake
IESTI	international estimate of short term intake
kg ai/ha	kilograms active ingredient per hectare
kg ai/hL	kilograms active ingredient per hectolitre
LC-MS/MS	Liquid chromatograph with mass detector
LOQ	limit of quantification (limit of quantification)
LP	large portion consumed (kg food/day) for IESTI calculations
mg/kg	milligrams per kilogram
MRL	Maximum Residue Limit
NTID	Nitrogen-phosphor selective detector
PHI	pre-harvest interval
RAC	raw agricultural commodity
STMR	supervised trials median residue
STMR-P	supervised trials median residue, processed commodity
TMDI	theoretical maximum daily intake

Note that the above abbreviations, and those of names of countries and organizations, are printed without stops (thus UK, USA, FAO, CCPR) but general abbreviations in common use have stops (c., e.g., etc., i.e., viz.). Consult the list at the beginning of recent JMPR Reports and Residue Evaluations for the correct form of abbreviations. Note the form of *et al*. (italics, with full stop after 'al').

Use Codex commodity descriptions[74] if possible and deal with commodities in the order of the "Types" in the Codex Classification of Foods and Feeds, i.e., Fruits, Vegetables,..., and then in the order of the groups within the types, e.g., Citrus fruits, Pome fruits, Stone fruits, etc.

Express residue concentrations as mg/kg and include references or study numbers in residue tables as it is important to identify the source of any reported data.

3.2 Diagrams

Use either electronic copies provided by manufacturers or draw diagrams using a commercial chemical structure drawing program, as shown below.

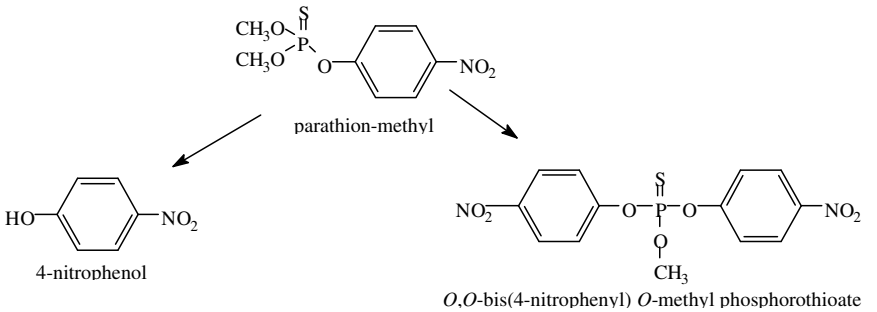

Figure X.1. Aerobic metabolism of parathion-methyl. (Evaluations 2000, Part 1 – Residues, p. 580).

4. JMPR REPORTS

Published JMPR Reports normally consist of 6 or 7 chapters and a number of annexes.

Some chapters and annexes are essentially compiled by the editor. The chapters and annexes of special interest to Panel members preparing for a Joint Meeting are the following.

Chapter 2. General considerations. Reports on any issue not specifically related to a compound are prepared for Chapter 2.

Chapter 3. Response to specific concerns raised by CCPR

Chapter 4. Dietary risk assessment for pesticide residues in food. The summarized results of the dietary risk assessments are reported in Chapter 4.

Chapter 5. Reports on individual compounds. The editor will convert Appraisal documents into reports for Chapter 4. Panel members, when writing Appraisals, should be aware that essentially the same words will appear as the JMPR report on the compound, which means that Appraisals should be complete in themselves and should not refer to specific Tables or Figures in the Evaluation.

[74] FAO/WHO. 1993. Codex Classification of Foods and Animal Feeds in Codex Alimentarius, 2nd ed., Volume 2. Pesticide Residues, Section 2. Joint FAO/WHO Food Standard Programme. FAO, Rome.

Annex 1. Detailed table of all MRL, STMR, HR, ADI, ARfD and residue definition recommendations from the meeting. Annex 1 is compiled from the recommendation tables of each compound.

Annex 3. Spreadsheet calculations of long-term intakes and comparison with ADIs.

Annex 4. International estimated short term intakes of pesticide residues

Annex 6. Livestock dietary burden

5. DUTIES OF THE FAO PANEL CHAIRPERSON AND RAPPORTEUR

The Chairperson maintains liaison with the WHO Group Chairperson on the progress of the Meeting, and together they arrange the schedule for joint sessions. The FAO Panel Chairperson serves as either Chairperson or Vice-Chairperson of the Joint Meeting.

The Chairperson ensures that all items are given reasonable discussion and tries to bring the Meeting to an agreement. Reasonable progress must be made, and the intention is to distribute advanced drafts of general report items to the WHO Group by the fourth last day of the Joint Meeting and final drafts of most report items by the third last day of the Joint Meeting.

The system has evolved where individual Panel members act as rapporteurs for discussion on any documents they have prepared. With the volume of work to be dealt with it would not be practical to channel all the work through one person.

The FAO Panel Rapporteur keeps in touch with the WHO Group Rapporteur, ensures that documents are exchanged, and keeps records of the exchanges.

The FAO Panel Rapporteur acts as the channel for copying, and ensures that documents are not delayed.

6. ACTIONS BEFORE THE MEETING

The FAO Joint Secretary to the JMPR will assign a “peer reviewer” for each compound on the FAO Panel agenda. The primary reviewer should send an essentially complete evaluation, an appraisal and dietary intake spreadsheets (electronic copies), to the peer reviewer approximately 4–6 weeks prior to the meeting. The peer reviewer should read the papers and send comments to the primary reviewer so that final drafts can be prepared for the meeting. In the last two or three weeks before the meeting, Panel members are usually very busy with final preparations and will not have time to devote full attention to the review of lengthy documents. For the pre-meeting peer review process to work properly documents must be distributed in adequate time.

Panel members should send an electronic copy of the table of recommendations for each compound to reach the FAO Joint Secretary two weeks before the commencement of the meeting. The purpose is to allow the FAO Joint Secretary or the editor to prepare much of Annex 1 before the meeting.

Panel members should send an electronic copy of the table of recommendations and of the section on processing studies and residues in the edible portion of food commodities for each compound to reach the WHO Joint Secretary two weeks before the commencement of the meeting. The purpose is to inform GEMS/Food about potential dietary intake situations for the compounds being evaluated.

Panel members should send final drafts of their papers to the FAO Joint Secretary in time for copies to be prepared for the meeting.

Authors should prepare a brief list of questions on each compound and points for discussion by Panel members. The list should be available on the first day of the Panel meeting and should aim to focus attention on any difficult questions that have arisen during the review.

7. A RESIDUE EVALUATION (DRAFT MONOGRAPH)

Prepare a draft evaluation for the Meeting using the following format. The use of uppercase, alignment of headings, bold and underlining should follow this format. In the top right-hand corner of the first page state the year, the draft number and the author's family name. A reference number will be assigned to the compound at the Meeting, e.g., FAO/2001/ref no. EV1 is added to the file name to show that it is draft 1 of the evaluation. The layout is shown below.

FAO/2001/
AUTHOR
COMPOUND_EV1.doc
DRAFT 1

COMPOUND (Codex number)

EXPLANATION

IDENTITY

METABOLISM AND ENVIRONMENTAL FATE
Animal metabolism
Plant metabolism
Environmental fate in soil
Environmental fate in water-sediment systems, if relevant

RESIDUE ANALYSIS
Analytical methods
Stability of pesticide residues in stored analytical samples
USE PATTERN

RESIDUES RESULTING FROM SUPERVISED TRIALS ON CROPS

FATE OF RESIDUES IN STORAGE AND PROCESSING
In storage
In processing
Residues in the edible portion of food commodities

RESIDUES IN ANIMAL COMMODITIES
Direct animal treatments
Farm animal feeding studies

RESIDUES IN FOOD IN COMMERCE OR AT CONSUMPTION

NATIONAL RESIDUE DEFINITIONS

REFERENCES

EXPLANATION

Provide a very brief history of the compound in the introductory sentence.

Parathion-methyl was first evaluated in 1965 and has been reviewed several times since, most recently in 1991, 1992, 1994 and 1995.

If a question was raised at the CCPR refer to the Session number and year.

At the 30th (1998) Session of the CCPR it was suggested (ALINORM 99/24, Appendix VII)…

If the compound is being reviewed in the CCPR periodic review programme, state this in the first paragraph.

Parathion-methyl was listed by the 1998 CCPR (30th Session, ALINORM 99/24, Appendix VII) for Periodic Re-evaluation for residues by the 2000 JMPR.

Mention briefly previous JMPR requests for further information if relevant to the topic. Summarize the information available to the Meeting. State that information was supplied by (list of countries) and the (basic) manufacturers. Do not include company names.

For new and periodic review compounds, state explicitly whether information was or was not provided on critical supporting studies (metabolism, farm animal feeding, processing, analytical methods, freezer storage stability).

For periodic review compounds, begin with the EXPLANATION section followed by the IDENTITY section. Omit the EXPLANATION section for new compounds.

IDENTITY

ISO common name:
Chemical name
  IUPAC: [Indented 12.5 mm]
  CAS:
CAS Registry No:
CIPAC No:
Synonyms and trade names:
Structural formula:
Molecular formula:
Molecular weight:

Physical and chemical properties

Pure active ingredient [Underlined, sentence case, left aligned]

Appearance:
Vapour pressure:
Melting point:
Octanol/water partition coefficient:
Solubility:
Specific gravity:
Hydrolysis:
Photolysis:
Dissociation constant:

Technical material [Underlined, sentence case, left aligned]

Appearance:
Density:
Purity:
Melting range:
Thermal Stability:
Stability:

Formulations

METABOLISM AND ENVIRONMENTAL FATE

Animal metabolism

For new and periodic review compounds animal metabolism studies should be available to both the FAO Panel and the WHO Group. Metabolism in laboratory animals, normally rats,

should be reviewed from the FAO Panel perspective. It should provide information which helps in the interpretation of farm animal metabolism and feeding studies. This information includes rates and pathways of excretion, identity and relative abundance of metabolites, and possible target organs for residues. Animal metabolism studies are sometimes supplied to the WHO Group only; the FAO Panel reviewer should specifically request these studies for a new compound or a periodic review compound if they have not been provided.

Introduce the section with a statement of the type of metabolism data received.

> *The Meeting received information on the fate of orally dosed spinosyns in lactating goats and laying hens and dermally applied spinosyns in lactating goats.*

Each study can then be introduced with a paragraph which acts as a checklist of the information to be recorded.

> *Tissue, egg and excreta residues were measured in laying hens (groups of 5, each bird weighing 1.0–1.4 kg) dosed orally for 7 days by capsule with radiolabelled mancozeb ([^{14}C]ethylenediamine) equivalent to 3, 14 or 36 ppm mancozeb in the feed (study reference). The feed intake was 88–96 g/bird/day. Eggs and excreta were collected throughout, and birds were slaughtered 24 hours after the final dose for tissue collection.*

Examine the animal metabolism in terms of the requirements for farm animal feeding studies (see Chapter 3 section, "Information and data from farm animal feeding and external animal treatment studies"). Draw conclusions from the animal metabolism which will assist interpretation of the farm animal feeding studies. Make statements about bioaccumulation and possible target tissues for residues.

Include studies on bioaccumulation in fish in this section.

Include an animal metabolism diagram at the end of the section.

Plant metabolism

Introduce the section with a statement of the type of metabolism data received.

> *The Meeting received information on the fate of spinosyns after foliar application to apples, cabbage, tomatoes, turnips, grapes and cotton.*

Again, the studies can then be introduced with a paragraph which acts as a checklist of the information to be recorded.

> *A tomato crop was treated with radiolabelled mancozeb ([^{14}C]ethylenediamine) at 2.7 kg ai/ha, on nine occasions at approximately weekly intervals, and ripe tomatoes were harvested 5 days after the final treatment (study reference).*

Draw conclusions from the plant metabolism studies which assist interpretation of the residue trials. State whether the residues are on the surface or within the plant tissues. Describe the mobility of the residues within the crop and say whether transfer from foliage to fruit, root or other edible portion is likely. Draw attention to any plant metabolite which is not also an animal metabolite.

Include a plant metabolism diagram at the end of the section.

Environmental fate in soil. Environmental fate in water-sediment systems

Follow the same format as described for the animal and plant metabolism sections, i.e., provide an introductory statement and then a paragraph describing the studies on each mode of environmental fate.

Include studies on residues in rotational crops in this section.

RESIDUE ANALYSIS

Analytical methods

The introductory sentence or paragraph should state the range of analytical methods received for evaluation and should mention the analytes (parent and degradation products) and the substrates tested.

Each analytical method should be briefly described in one or two paragraphs or in a summary table format. Include the extraction, cleanup and final method of determination, e.g., GLC-FPD. Draw attention to critical or difficult steps in the analysis and difficult substrates. Report the method validation analytical recoveries in terms of substrates tested, spiking levels, number of tests and range of recoveries. State the LOQ.

Include the results of testing the compound through standard enforcement and multiresidue analytical methods whether the compound is successfully analysed by the method or not.

Stability of pesticide residues in stored analytical samples

The introductory sentence should summarize the information provided to the JMPR.

The Meeting received data on the stability of residues in snap beans, kidney beans, cotton seed, strawberry, plum, apple, sunflower seed, almond kernel, spinach, green peppers, orange, clover, canola seed, canola crude oil, canola meal, canola processing waste, sorghum flour, maize and processed maize commodities stored frozen.

USE PATTERN

Introduce the section with a statement of the compound uses.

Parathion-methyl is registered in many countries for control of insect pests on fruit, vegetables, cereals, oilseeds and forage crops. The information available to the Meeting on registered uses is summarized in Table .....

Comparison of Good Agricultural Practice (GAP) with conditions in the supervised trials is a necessary part of the evaluation process and therefore the table of GAP should be prepared in such a way to allow easy comparison. An excerpt of the GAP table from the parathion-methyl evaluation (Evaluations 2000, Part 1–Residues, p. 617) is provided below for reference.

The first column in the table should list the crops, and all uses on each crop should be brought together. This facilitates evaluation of the residue data. Other columns in the table should list countries (in alphabetical order), the formulation type, application (method, rate, spray concentration, number) and PHI. Note that this is the general case and there is often a need for further information such as details of the use pattern, e.g., furrow treatment or seed treatment, crop growth stage, grazing withdrawal, etc.

Avoid trade names in the table; give the composition and formulation type, e.g., 100 g/kg WP, 200 g/L EC. Use CIPAC abbreviations for formulation types (see Appendix III).

Indicate where official labels have been provided. GAP summaries provided to JMPR have often included details that are not on labels, e.g., only one of application rate and spray concentration may be stated on the label but both have been included in GAP summaries provided to JMPR. The maximum number of applications is often not on the label. US labels may state the maximum amount of pesticide permitted in a season, which should be included in the table (preferably as a footnote) as maximum amount rather than calculated from the

application rate and maximum number of applications. Any information that is not on a label should be indicated by a table endnote if it is included in the table.

Indicate by an endnote to the table uses that are not yet official but are still proposed uses.

Table X.1. Registered parathion-methyl uses

Crop	Country	Form	Application Method	Rate, kg ai/ha	Spray conc. kg ai/hL	Number	PHI days
Agric and horti crops	Netherlands	EC	soil treatment	2.6		1	
Alfalfa	Hungary	CS 450 g/L	foliar	0.45			14
Alfalfa	Hungary	EC 480 g/L	foliar	0.24-0.34			14
Alfalfa	USA	EC 480 g/L	foliar	0.28-1.1			15
Apple	Australia	ME 240	foliar	-	0.03	note [a]	14

[a] apples and pears—apply as determined by trap counts at minimum intervals of 2 weeks

Remarks can be added as table endnotes, e.g., aerial application, field and glasshouse use, glasshouse use only, growth stage restriction, interval between applications, post-harvest use, seed treatment, table grapes only, wine grapes only.

If there are many uses, split them into separate tables for fruits, vegetables, etc.

Use the following units for application rates and spray concentrations; note that abbreviations are without full stops:

field treatment	kg ai/ha
grain treatment, post-harvest	g ai/t
furrow treatment	g ai/m
space fumigation	g ai/m^3
spray concentration	kg/ai/hL

RESIDUES RESULTING FROM SUPERVISED TRIALS ON CROPS

Where there are many residue tables, insert a list of them at the beginning of the section, in numerical order. An excerpt from a list of parathion-methyl residue tables is provided below (Evaluations 2000, Part 1 – Residues, p. 594).

The Meeting received information on parathion-methyl supervised field trials for

Fruits	Apple, pear	Table 20.
	Peach	Table 21.
	Grapes	Table 22.
Vegetables	Onions	Table 23.
	Broccoli	Table 24.
	Cabbage	Table 25.

Describe in introductory paragraphs those points that apply to all the trials, e.g., expression of residues below LOQ, adjustment for recoveries, rounding and residues in control plots.

Residue levels and application rates were reported as chlormequat chloride, but the residues were generally recalculated as cation in the Appraisal. When residues were not detected they are shown as below the LOQ, e.g., < 0.1 mg/kg. Residues, application rates and spray concentrations have generally been rounded to two significant figures. HR and STMR values from the trials conducted according to maximum GAP have been used for the estimation of maximum residue levels. These results are underlined.

Laboratory reports included method validation including batch recoveries with spiking at residue levels similar to those occurring in samples from the supervised trials. Dates of analyses or duration of residue sample storage were also provided. Field reports provided data on the sprayers used and their calibration, plot size, residue sample size and sampling date. Although trials included control plots, no control data are recorded in the tables except where residues in control samples exceeded the LOQ. Residue data are recorded unadjusted for % recovery.

Discuss details which are not readily included in the tables but are still needed to assess the validity and relative importance of the results, for example the intervals between spray applications, the number of replicate plots, whether samples are replicates from the same or different plots or merely replicate analyses of the same sample, the size of plots, growing season, method of application, irrigation and, in animal trials and feed studies, animal weights and ages. The reviewer's judgement is required to decide which details could influence the residues or the validity of the trials.

Tables of residues resulting from supervised trials should be carefully prepared in such a way as to assist evaluations. An excerpt from the parathion-methyl evaluation (Evaluations 2000, Part 1–Residues, p. 602) is provided below for reference.

Deal with commodities in Codex commodity order, i.e., fruits before vegetables, citrus fruits, then pome fruits, stone fruits, etc. Where a crop produces more than one commodity, e.g., cereal crops produce grains and forage and fodder, prepare separate residue data tables for the grain and the forage and fodder.

The table caption should be clear and comprehensive. Include the compound and the crops or crop groups, and indicate that the residues were found in supervised trials.

The year in the first column of the table is the year of the trial rather than the year of the report. Where trials have been conducted in a large country, include the state or region in brackets after the country, e.g., USA (CA).

"Application" should include the formulation type, the rate of application (kg ai/ha), spray concentration (kg ai/hL), the water volume (L/ha) and the number of applications.

List the pre-harvest intervals (PHIs) vertically and report individual residues as far as possible. If there are a number of values at the same level they can be recorded as < 0.05 (7), where there are 7 values of < 0.05 mg/kg.

Underline those residues which are within GAP and have been selected for estimation of STMR, but wherever such underlining is used its meaning should be explained in the introductory paragraphs of the section, "Residues resulting from supervised trials on crops." Underlining is very helpful for people assessing the results, particularly when the tables are extensive, and allows other Panel members to see where the reviewer has judged data to be within or outside GAP.

Round numbers in tables to a practical level. A formulation concentration should be reported as 250 g ai/kg, not 250.00 g ai/kg. Residues should be reported as 0.046, 0.36 and 4.5 mg/kg, not 0.0463, 0.363 and 4.47 mg/kg.

Table X.2. Parathion-methyl and paraoxon-methyl residues in wine grapes from supervised trials in France and Italy.

GRAPES country, year (variety)	Application					PHI days	Residues, mg/kg		Ref
	Form	kg ai/ha	kg ai/hL	water, L/ha	no.		parathion-methyl	paraoxon-methyl	
France, 1994 (Chenin Blanc)	CS	0.29	0.15	200	2	0 3 7 14 21 35	0.09 0.05 0.11 0.06 0.05 0.07	< 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01	AP/2582/HR F1 951174
France, 1994 (Chenin blanc)	EC	0.30	0.15	200	2	0 3 7 14 21	0.05 0.04 0.01 < 0.01 < 0.01	< 0.01 < 0.01 < 0.01 < 0.01 < 0.01	Tours F1 951175
France, 1994 (Grenache)	CS	0.32	0.16	200	2	0 3 7 14 21 31	0.28 0.16 0.28 0.11 0.13 0.07	< 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01	AP/2582/HR Site II 951174
Italy, 1994 (Sangiovese) - red	CS	0.30	0.060	500	2	0 7 14 21	0.30 0.12 0.14 0.16 0.18		407240

In tabulating the residue trials data the FAO Panel reviewer should indicate the levels of relevant metabolites separately from those of the parent compound, but in a way which allows subsequent combination, in order to ensure that changes in the residue definition can be accommodated at the Joint Meeting.

An example is taken from the 2008 JMPR evaluation of spinetoram which shows the proper presentation of residue levels of two metabolites obtained from replicate samples (Table X.3) together with the calculated total residue.

Where the residue definition for dietary intake assessment is different from enforcement the relevant residue data may be reported in separate table (X.4)

Table X.3. Residues of spinetoram from supervised trials on orange in the USA (for estimation of maximum residue level)

ORANGE Location, year (Variety)	Form	Application			Total/ season, g ai/ha	PHI, days	Residue, mg/kg			Report No.
		g ai/hL	g ai/ha	No			XDE-175-J	XDE-175-L	Total	
GAP, USA Citrus fruits	SC or WG		53-105	3	210	1				
Foliar application using low spray volume (~700 L/ha)										
Deleon Springs, FL, 2004 (Valencia)	SC	10	70-72	3	213	1	0.030 0.028	< 0.01 < 0.01	0.030 0.028	040063

ORANGE Location, year (Variety)	Form	Application			Total/ season, g ai/ha	PHI, days	Residue, mg/kg			Report No.
		g ai/hL	g ai/ha	No			XDE-175-J	XDE-175-L	Total	
Mount Dora, FL, 2004 (Valencia)	SC	11	71-72	3	214	1	0.011 0.022	ND < 0.01	0.011 <u>0.022</u>	040063

Table X.4. Residues of spinetoram and metabolites from supervised trials on orange in the USA (for estimation of STMR)

ORANGE Location, year (Variety)	Form	Application			Total/ season, g ai/ha	PHI, days	Residue, mg/kg					Report No.
		g ai/hL	g ai/ha	No			XDE-175-J	XDE-175-L	ND-J	NF-J	Total	
GAP, USA Citrus fruits	*SC or WG*		*53-105*	*3*	*210*	*1*						
Foliar application using low spray volume (~700 L/ha)												
Deleon Springs, FL, 2004 (Valencia)	SC	10	70-72	3	213	1	0.030 0.028	< 0.01 < 0.01	0.011 0.014	0.016 0.024	0.057 <u>0.066</u>	040063
Mount Dora, FL, 2004 (Valencia)	SC	11	71-72	3	214	1	0.011 0.022	ND < 0.01	< 0.01 0.012	< 0.01 0.017	0.021 <u>0.051</u>	040063

FATE OF RESIDUES IN STORAGE AND PROCESSING

In storage

Include information on the fate of residues during commercial storage of food commodities, e.g., during cold storage of fruit or silo storage of cereal grains.

In processing

Introduce the section with a statement on the data provided on processed commodities.

> *The Meeting received information on the fate of incurred residues of parathion-methyl and paraoxon-methyl during the processing of apples, peaches, grapes, olives, snap beans, soya beans, potatoes, sugar beet, wheat, maize, rice, cotton seed, sunflower seed and canola. Information on the fate during drying of hops is included in the supervised residue trials.*

Set out tables carefully so that it is absolutely clear which sample is derived from which in the processing. Indicate the scale of the process by the weight of commodity processed and whether the initial RAC residue is from the actual bulked sample or from a separate field sample from the same trial. Note any problems with sampling or analysis. Provide a brief description of the field treatments in the trial and state the application rate in the study with respect to the maximum label rate, e.g., 5×label rate.

Introduce each processed commodity with a paragraph summarizing the information provided, tabulate the residue data and include a flow diagram to explain complex commercial processes.

> *<u>Soya beans</u>. Parathion-methyl was applied twice to soybeans at 2.8 kg ai/ha (5×label rate) in two trials in USA in 1988 and the crops were harvested 15 days after the final treatment for processing (Figure X.2). In one trial (MP-SY-2102) the residue levels*

were below LOQ for all commodities. In trial MP-SY-2101 parathion-methyl levels depleted in the meal and increased in the oils (Table X.5).

Table X.5 Parathion-methyl and paraoxon-methyl residues in soya beans and processed commodities

SOYA BEANS	Application				PHI		Residues, mg/kg		Ref
country, year (variety)	Form	kg ai/ha	kg ai/hL	water, L/ha	no. days	commodity	parathion-methyl	paraoxon-methyl	
USA (IA), 1988 (Pioneer 9271)	EC	2.8		200	2 15	dry seed	0.15	< 0.05	MP-SY-2101
						meal	< 0.05	< 0.05	
						hulls	0.12	< 0.05	
						crude oil	0.71	< 0.1	
						refined oil	0.57	< 0.1	

Excerpt from Table 59. (Evaluations 2000, Part 1–Residues, p. 654)

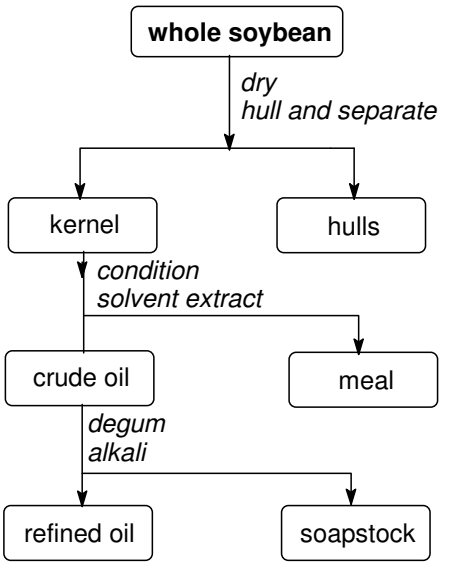

Figure X.2. Soybean processing (ref)

(Evaluations 2000, Part 1 – Residues, p. 655)

Processing factors (residue in processed commodity ÷ residue in raw commodity) may be included in the processing residue data table in simple cases. In more complex cases with different residue definitions for enforcement and dietary intake it is preferable to summarize processing factors in a separate table. Examples are given in tables X.6 and X.7.

Table X.6 Processing factors, HR-P and STMR-P values for various commodities

Raw agricultural commodity			Processed commodity			
Commodity	STMR (mg/kg)	HR (mg/kg)	Commodity	Processing factor	STMR-P (mg/kg)	HR-P (mg/kg)
Plum	0.80	3.6	Prunes (dried plums)	1.91	0.96	4.3
			Juice	0.10	0.080	

Raw agricultural commodity			Processed commodity			
Commodity	STMR (mg/kg)	HR (mg/kg)	Commodity	Processing factor	STMR-P (mg/kg)	HR-P (mg/kg)
			Preserves	0.50	0.40	
Xxx						

Table X.7 Example for presenting a complex case

Commodity	Processing factor$_{propineb}$	Propineb residues (mg/kg)		Processing factor$_{PTU}$	Propylenethiourea residues (mg/kg)		Adjusted values (mg/kg)	
		For STMR/ STMR-P	For HR/ HR-P		For STMR/ STMR-P	For HR/ HR-P	STMR [a]	HR [b]
Cherry		0.128	0.351		0.01	0.02		
Washed	0.63	0.0803	0.221	1	0.01	0.02	0.103	0.287
Juice	0.55	0.0701		0.68	0.0068		0.0858	
Preserves	0.15	0.0191		0.5	0.005		0.0306	
Jam	0.35	0.0446		0.78	0.0078		0.0626	
Tomato		1.0	2.93		0.03	0.16		
Washed	0.45	0.45	1.32	0.4	0.012	0.064	0.478	1.53
Juice	0.12	0.12		0.91	0.0273		0.183	
Preserves	0.15	0.15		0.75	0.0225		0.202	
Ketchup	0.12	0.12		0.54	0.0162		0.157	
Paste	1.1	1.1		11	0.33		1.86	

[a] Adjusted STMR-P = STMR-P$_{propineb}$ + 2.3 × STMR-P$_{propylenethiourea}$

[b] adjusted HR-P = HR-P$_{propineb}$ + 3.3 × HR-P$_{propylenethiourea}$

Residues in the edible portion of food commodities

Draw attention to those commodities where residue levels in the edible portion are different from those in the whole commodity, e.g., citrus, bananas, trimmed celery and cabbage with outer leaves discarded.

RESIDUES IN ANIMAL COMMODITIES

Direct animal treatments

Pesticides may be applied directly to farm animals for control of lice, flies, mites and ticks. Application may include dips, sprays, pour-ons and jetting. Residue trials using the required method of application, dosage and withdrawal times are needed if residues may occur in animal commodities. Where feasible, data from supervised residue trials on animals should be summarized in tables similar to those for crops.

Farm animal feeding studies

Farm animal feeding studies use unlabelled compounds to establish the relationship between the levels of the residues in the feed and likely residues in tissues, milk and eggs.

Farm animal feeding studies may be introduced by a paragraph that acts as a checklist of the information.

> *Groups of 10 laying hens (each bird weighing 1.0–1.3 kg) were fed aged mancozeb residues at nominal levels of 5, 15 and 50 ppm (1×, 3× and 10×) in the diet for 28 days (study reference). Eggs were collected each day for analysis. On day 29 six hens*

from each group were slaughtered for tissue collection. The remaining hens from each group were placed on a residue-free diet and slaughtered on days 36 and 43. Birds consumed 130 g feed each per day.

RESIDUES IN FOOD IN COMMERCE OR AT CONSUMPTION

Introduce the section with a statement on the residue monitoring data provided. Tabulate the information and list the commodity, number of samples analysed and the residues detected according to Chapter **3,** Section.10.

NATIONAL RESIDUE DEFINITION

It will usually be preferable to summarize the information in a table.

REFERENCES

References to unpublished reports, journals and books should be listed in tabular form as in the following example. References are sorted alphabetically according to study (or report) number, then author, then year.

Code	Author	Year	Title
	MacDougall D	1964	Guthion. In: Zweig, G., Analytical Methods for Pesticides, Plant Growth Regulators and Food Additives, Vol. II, Academic Press, New York, London.
	Meagher WR, Adams JM, Anderson CA and MacDougall D	1960	Colorimetric determination of Guthion residues in crops. *J. Agric. Food Chem.* 8, 282-6
B221/85	Gildemeister H, Bürkle WL and Sochor H	1985	Hoe 029664-14-C. Anaerobic soil metabolism study with the fungicide triphenyltin hydroxide (TPTH). Hoechst Analyt. Labor., Germany. Rep. B221/85. Unpublished.
OEK 83 001E	Fischer R and Schulze E-F	1983	The effect of Hoe 02782 OF AT202 (fentin acetate, active ingredient 96.4%) on *Salmo gairdneri* (Rainbow trout) in a static test. Hoechst Pfl. Fo. Biol., Germany. Rep. OEK 83 001E. Unpublished.
OEK 83/028E	Fischer R and Schulze E-F	1983	The effect of Hoe 29664 OF AT205 (fentin hydroxide, active ingredient 97.0%) on *Salmo gairdneri* (Rainbow trout) in a static test. Hoechst Pfl. Fo. Biol., Germany. Rep. OEK 83/028E. Unpublished.

Notes:

a. Study references in tables require the study number (or report number).

b. Citations in the text should be of the form: Author, year, study (or report) number.

c. Citations in the text should name both of two authors, but only the first of three or more e.g., from the example above: Gildemeister *et al*. 1985, B221/85.

DRAFT APPRAISAL

Prepare a draft appraisal for the Meeting using the following format. The use of uppercase, alignment of headings, bold and underlining should follow this format. In the top right-hand corner of the first page state the year, the draft number and the author's family name. A reference number will be assigned to the compound at the Meeting, e.g., FAO/2001/ref no. AP1 is added to the file name to show that it is draft 1 of the appraisal. The layout is shown below.

FAO/2001/
AUTHOR
COMPOUND_AP1.doc
DRAFT 1

COMPOUND (Codex number)

APPRAISAL

Animal metabolism

Plant metabolism

Environmental fate in soil

Environmental fate in water-sediment systems

Methods of analysis

Stability of residues in stored analytical samples

Definition of the residue

Results of supervised trials on crops

Fates of residues during processing

Residues in animal commodities

RECOMMENDATIONS FURTHER WORK OR INFORMATION

Required (by [year])

Desirable

DIETARY RISK ASSESSMENT

Long-term intake

Short-term intake

Interpretation of the residue data should generally be in the APPRAISAL section of the evaluation rather than in RESIDUES RESULTING FROM SUPERVISED TRIALS ON CROPS.

The APPRAISAL section of the monograph, together with the FURTHER WORK OR INFORMATION, RECOMMENDATIONS and DIETARY RISK ASSESSMENT, is prepared as a separate document for intensive discussion at the meeting. It contains the logic and a full explanation for each recommendation.

Line numbering should be used in the draft Appraisal to assist discussion at the Meeting.

Briefly explain the reasons for the review and summarize the information available. The subject order in the appraisal should follow the order in the evaluation.

Do not include tables in the text of the appraisal, unless it makes the presentation clearer, i.e., abbreviations of metabolites used in the text, summary of detailed processing studies or corresponding processing factors, with the exception of the farm animal dietary burden calculation table and the animal commodity STMR and MRL calculation table.

If it is recommended that the residue definition for the risk assessment be different from that for enforcement, this must be clearly stated in the appraisal.

When the residue definition includes more than one component, the appraisal should include an explicit description of how the total residue is calculated from the components. The explanation should show necessary molecular weight adjustments and how "less-than LOQ" residues are dealt with.

Example: fipronil

When one component of the fipronil residue is above and the other below the LOQ, the combined residue is assumed to be close to the residue of the measurable component plus the LOQ of the other. To indicate that one of the residue results is a real measurement, express the sum of the values as a real figure, e.g., < 0.002 + 0.004 mg/kg = 0.006 mg/kg. The method for calculating the total residue for various situations is illustrated below.

Fipronil	Metabolite MB 46136 or MB 46513	Total
< 0.002	< 0.002	< 0.004
< 0.002	0.004	0.006
0.003	0.005	0.008

The residue concentrations for fipronil (437.2 g/mol) and the metabolites MB 46136 (453.1 g/mol, factor 0.965) and MB 46513 (389.02 g/mol, factor 1.1) are expressed in the evaluation tables as the individual compounds *per se*, but are calculated in the appraisal according to the respective residue definition (expressed as fipronil). The LOQs of the individual compounds are not adjusted by these factors.

Example: spinosad

The residue definition for spinosad requires the addition of spinosyns A and D residues. Spinosyn A constitutes approximately 85% of the residue initially and in practice constitutes the majority of the spinosyn residue. In this calculation where the residue of spinosyn D was < LOQ it was assumed to be zero except when both spinosyns A and D residues were < LOQ and in that case the total was taken as < LOQ. These are reasonable assumptions since the spinosyn D level is usually much less than the spinosyn A level. The method for calculating the total residue for various situations is illustrated below.

spinosyn A	spinosyn D	Sum of spinosyns A and D
0.59	0.082	0.67
0.03	< 0.01	0.03
< 0.01	< 0.01	< 0.01

Provide in full the interpretation used to estimate a maximum residue level. Explain extrapolations, comparability and any conditions of use, crop characteristics etc. which influence the interpretation. As an example the following paragraph states the relevant use pattern on the crop, the number of trials and country to match the use pattern and the residue data selected for estimating STMRs in rank order. The concluding paragraph on this

commodity states explicitly the recommended MRL and STMR and includes the residue expressions according to the relevant residue definitions.

> *The UK use pattern on strawberries allows thiram applications of 1.6 kg ai/ha beginning at white bud burst, with repeats at 7–10 day intervals and a PHI of 7 days. Seven strawberry trials in Belgium were evaluated against the use pattern of the UK. The highest thiram residues (median underlined) in each trial within range of the UK use pattern were: 1.4, 1.4, 2.1, <u>2.1</u>, 2.4, 2.8 and 3.1 mg/kg. The highest residue, 3.1 mg/kg as thiram, is equivalent to 2.0 mg/kg dithiocarbamates as CS_2.*
>
> *The Meeting estimated a maximum residue level of 5 mg/kg for dithiocarbamates (as CS_2) in strawberry arising from the use of thiram. The Meeting estimated an STMR value of 2.1 mg/kg for thiram (as thiram) on strawberry.*

Examples of other concluding sentences are:

> *The Meeting agreed to withdraw the recommendations for cherries (1 mg/kg), peaches (3 mg/kg) and plums (1 mg/kg).*
>
> *The Meeting estimated an STMR value of 0.05 mg/kg and a maximum residue level of 0.05* mg/kg for pecans. The HR was 0.05 mg/kg.*
>
> *The Meeting estimated an STMR value of 0.38 mg/kg and a maximum residue level of 2 mg/kg for sweet peppers. The latter replaces the previous recommendation (0.5 mg/kg). The HR was 1.4 mg/kg.*
>
> *The Meeting agreed to withdraw the previous maximum residue level recommendation for citrus fruits (5 mg/kg), to be replaced by recommendations for oranges (1 mg/kg) and mandarins (2 mg/kg).*
>
> *The Meeting agreed to maintain the current recommendation of 0.2 mg/kg for potatoes.*

RECOMMENDATIONS

Use a standard introductory paragraph.

> *On the basis of the data from supervised trials the Meeting concluded that the residue levels listed below are suitable for establishing maximum residue limits and for IEDI and IESTI assessment.*

State the residue definition–choose the appropriate statement. Additional statements will be required if the residue definitions are different for crops and animals.

> *For plants and animals: Definition of the residue for compliance with MRLs and estimation of dietary intake: [residue definition].*
>
> *For plants and animals: Definition of the residue for compliance with MRLs: [residue definition 1]. For estimation of dietary intake: [residue definition 2].*

If the residue is fat-soluble, insert the following sentence after the residue definition.

> *The residue is fat-soluble.*

List all commodities with MRL, STMR and HR recommendations, alphabetically in the recommendations table. HR recommendations are not required for those compounds where an ARfD is unnecessary.

CCN	Commodity Name	MRL, mg/kg New	 current	STMR or STMR-P mg/kg	HR or HR-P mg/kg

Include at the end of the table, HR-Ps and STMR-Ps for processed commodities with no recommended maximum residue levels if these residue values are used in the dietary intake estimates.

The recommendations table for periodic review compounds should include all current MRLs or, more correctly, current JMPR MRL recommendations. The table will then show whether each MRL is maintained, amended or withdrawn.

Any recommendations to withdraw MRLs should be entered in the table of Recommendations, which will be reproduced in Annex 1 to the report, and not merely mentioned as a recommendation in the text. A statement such as "the Meeting recommended the withdrawal of the MRL for pome fruits" could be easily missed when Annex 1 is being compiled.

Where no residue is expected in animal commodities, irrespective of feeding levels, the JMPR recommends MRLs at or about the LOQ for the animal commodities. These recommended MRLs alert users of Codex MRLs that the situation has been fully evaluated and that, for the commodities of trade, residues should not occur above the stated LOQ.

In such cases include a footnote under the recommendation table stating that '*No residues are expected from consumption of feed commodities with [xxx pesticide] residues as evaluated by JMPR*'.

FURTHER WORK OR INFORMATION

The items listed as required or desirable should be numbered if there is more than one.

Required

All items listed as required should have a year proposed as the due date. Choose 2 years from the current Meeting as the due date in the absence of other information, e.g., a definite commitment by a country or company to provide information by a nominated date.

Each item listed as required should be tied to a TMRL. If the required information is not supplied by the due date, the Meeting can then recommend withdrawal of the TMRL.

TMRLs are generally not introduced for new compounds or periodic review compounds. Their use should be kept to a minimum.

Desirable

Information requested as desirable is not vital to the continued existence of MRLs, but is requested because it may assist in an explanation, support an extrapolation or provide a more complete data base.

DIETARY RISK ASSESSMENT

Note that references to Annexes 3 are for text in the JMPR Reports. When converted to monographs for the Residue Evaluations, the references must be changed to "Annex [X] and [Y] of [year] JMPR Report."

Long-term intake

Estimated intake within the ADI

Use the following standard statements for the long-term dietary risk assessment where the estimated intake is within the ADI.

Situation: The compound was subject to a toxicology evaluation but not a residue evaluation. MRLs, but not STMRs, are available. The TMDI for the 13 diets was less than the ADI.

Estimated Theoretical Maximum Daily Intakes for the GEMS/Food regional diets, based on recommended MRLs, were in the range of [..] to [..]% of the maximum [ADI](Annex 3). The Meeting concluded that the long-term intake of residues of [pesticide] resulting from its uses that have been considered by the JMPR is unlikely to present a public health concern.

Situation: The compound was new or subject to a periodic review for residues. The IEDI for the 13diets was less than the ADI.

The International Estimated Daily Intakes of [pesticide], based on the STMRs estimated for [..] commodities, for the GEMS/Food regional diets were in the range of [..] to [..]% of the maximum ADI (Annex 3). The Meeting concluded that the long-term intake of residues of [pesticide] resulting from its uses that have been considered by JMPR is unlikely to present a public health concern.

Situation: The compound was subject to residue review, but not a periodic review, for a number of commodities. The estimated intakes for the 13 regional diets were less than the ADI.

In the current evaluation STMRs were estimated for [..] commodities. Where consumption data were available these STMRs were used in the estimates of dietary intake together with previous MRL recommendations for [..] other food commodities. The results are shown in Annex 3.

The estimated daily intake for the five GEMS/Food regional diets were in the range of [..] to [..]% of the maximum ADI (Annex 3). The Meeting concluded that the long-term intake of residues of [pesticide] resulting from its uses that have been considered by the JMPR is unlikely to present a public health concern.

Estimated intake exceeds the ADI

Use the following standard statements for the long-term dietary risk assessment where the estimated intake exceeds the ADI.

Situation: The compound was subject to a toxicology evaluation but not a residue evaluation. MRLs, but not STMRs, are available. The TMDI for at least one of the diets exceeded the ADI.

Estimated Theoretical Maximum Daily Intakes for the 13 GEMS/Food regional diets, based on recommended MRLs, were in the range of [..] to [...]% of the maximum ADI

(Annex 3). Further refinements of dietary intake estimates will be undertaken during the periodic review of residues scheduled for [year].

Situation: The compound was new or subject to a periodic review for residues. The IEDI for one of the diets exceeded the ADI.

The International Estimated Daily Intake of [pesticide], based on the STMRs estimated for [..] commodities, was [...]% of the maximum ADI for the GEMS/Food [list diet(s)] diet. International Estimated Daily Intakes for the other GEMS/Food regional diets were in the range of [..] to [..]% of the ADI (Annex 3).

The information provided to the JMPR precludes an estimate that the dietary intake would be below the maximum ADI.

Situation: The compound was subject to residue review, but not a periodic review, for a number of commodities. The estimated intake exceeded the ADI for the all regional diets.

In the current evaluation STMRs were estimated for [..] commodities. Where consumption data were available these STMRs were used in the estimates of dietary intake together with previous MRL recommendations for [..] other food commodities. The results are shown in Annex 3.

The estimated daily intake exceeds the ADI for the thirteen GEMS/Food regional diets: A [...]%, B .... and M [...]%.

The Meeting concluded that the long-term dietary intake of [pesticide] residues may exceed the ADI for all GEMS/Food regional diets. Further refinements of dietary intake estimates will be undertaken during the next periodic review of residues or when additional relevant data are provided.

Short-term intake

ARfD unnecessary

Situation: The JMPR toxicology assessment has concluded that an ARfD is unnecessary.

The [year] JMPR decided that an ARfD is unnecessary. The Meeting therefore concluded that the short-term intake of [pesticide] residues is unlikely to present a public health concern.

All IESTI values within ARfD

Situation: The compound was new or subject to periodic review for residues. The estimated short-term intakes for all commodities were within the ARfD.

The International Estimated Short term Intake (IESTI) for [pesticide] was calculated for [..] food commodities [(and their processed fractions)] for which maximum residue levels were estimated and for which consumption data were available. The results are shown in Annex 4.

The IESTI represented [.. - ...]% of the maximum ARfD for the general population and [.. - ...]% of the maximum ARfD for children. The Meeting concluded that the short-term intake of residues of [pesticide], when used in ways that have been considered by the JMPR, is unlikely to present a public health concern.

IESTI values exceed ARfD

Situation: The compound was new or subject to periodic review for residues. The estimated short-term intakes for some commodities exceeded the ARfD.

The International Estimated Short term Intake (IESTI) for [pesticide] was calculated for [..] food commodities [(and their processed fractions)] for which maximum residue levels were estimated and for which consumption data were available. The results are shown in Annex 4.

The IESTI represented [.. - ...]% of the maximum ARfD for the general population and [.. - ...]% of the maximum ARfD for children. The values [...], [...] and [...]% represent the estimated short-term intake for [commodity 1], [commodity 2] and [commodity 3] respectively for the total population. The values [...], [...] and [...]% represent the estimated short-term intake for [commodity 1], [commodity 2] and [commodity 3] respectively for children.

The Meeting concluded that the short term intake of residues of [pesticide] from uses, other than on these [..] commodities, that have been considered by the JMPR is unlikely to present a public health concern.

ARfD not available, but may be necessary

Situation: The compound was subject to residue review for a number of commodities. The compound has not been subject to a recent toxicological assessment, so there is no ARfD, but an ARfD may be necessary.

The International Estimated Short Term Intake (IESTI) for [pesticide] was calculated for [..] food commodities [(and their processed fractions)] for which maximum residue levels were estimated at the present meeting and for which consumption data were available. The results are shown in Annex 4. The Meeting concluded that an ARfD may be necessary, but as it has not yet been established, the acute risk assessment for [pesticide] was not finalized.

ARfD previously not available, but now established

Situation: The present JMPR has established an ARfD for a compound which had been subject to residue review for a number of commodities in a previous year and where the acute risk assessment was not then able to be finalized. The estimated short-term intakes for all commodities were within the ARfD.

The Meeting estimated an ARfD ([....] mg/kg bw) for [pesticide]. The [year] JMPR had calculated the International Estimated Short Term Intake (IESTI) for [pesticide] for [..] food commodities [(and their processed fractions)] for which maximum residue levels were estimated and for which consumption data were available, but was not able to finalize the risk assessment because an ARfD was not the available.

The IESTI represented [.. - ...]% of the maximum ARfD for the general population and [.. - ...]% of the maximum ARfD for children. The Meeting concluded that the short term intake of residues of [pesticide], when used in ways that have been considered by the JMPR, is unlikely to present a public health concern.

Situation: The present JMPR has established an ARfD for a compound which had been subject to residue review for a number of commodities in a previous year and where the acute risk assessment was not then able to be finalized. The estimated short-term intakes for some commodities exceeded the ARfD.

The Meeting estimated an ARfD ([....] mg/kg bw) for [pesticide]. The [year] JMPR had calculated the International Estimated Short Term Intake (IESTI) for [pesticide] for [..] food commodities [(and their processed fractions)] for which maximum residue levels were estimated and for which consumption data were available, but was not able to finalize the risk assessment because an ARfD was not the available.

The IESTI represented [.. - ...]% of the maximum ARfD for the total population and [.. - ...]% of the maximum ARfD for children. The values [...], [...] and [...]% represent the estimated short-term intake for [commodity 1], [commodity 2] and [commodity 3] respectively for the total population. The values [...], [...] and [...]% represent the estimated short-term intake for [commodity 1], [commodity 2] and [commodity 3] respectively for children.

The Meeting concluded that the short term intake of residues of [pesticide] from uses, other than on these [..] commodities, that have been considered by the JMPR is unlikely to present a public health concern.

Appendix XI

TABLE AND SPREADSHEET EXAMPLES

CONTENTS

Table XI.1. Residue interpretation table for folpet residues on tomatoes. GAP and trial conditions are compared for treatments considered valid for MRL and STMR estimation. (JMPR 1998).

Crop	Country	Use pattern				Trial	folpet,
		kg ai/ha	kg ai/hL	No of appl	PHI days		mg/kg
Tomato	Chile GAP	1.7	0.15		7		
Tomato	Chile trial	1.7	1.5	7	7	[trial no.]	2.4
Tomato	Hungary GAP		0.13		14		
Tomato	Hungary trial	0.65	0.13	3	14		< 0.05
Tomato	Hungary trial	0.65	0.13	3	14		< 0.05
Tomato	Hungary trial	0.65	0.13	3	14		< 0.05
Tomato	Hungary trial	0.66	0.13	3	14		< 0.05
Tomato	Hungary trial	0.63	0.12	5	14		< 0.02
Tomato	Mexico GAP	2.0			no limit		
Tomato	Mexico trial	2.0	0.67	5	2		1.0
Tomato	Mexico trial	2.0	0.71	5	2		1.6
Tomato	Mexico trial	2.0	0.66	5	2		1.8
Tomato	Mexico trial	2.0	0.71	5	2		0.45
Tomato	Mexico trial	2.0	0.72	5	2		1.3
Tomato	Portugal GAP		0.13		7		
Tomato	Portugal trial	1.3	0.16	4	7		0.34
Tomato	Portugal trial	1.3	0.16	4	7		0.58
Tomato	Spain GAP		0.15		10		
Tomato	Italy trial	1.2	0.13	4	10		0.60
Tomato	Italy trial	1.3	0.13	4	10		0.70
Tomato	Italy trial	1.3	0.13	4	10 (14)	Note[a]	0.80
Tomato	Italy trial	1.2	0.13	4	10		0.43
Tomato	Spain trial	1.6	0.20	6	10		1.3
Tomato	Spain trial	2.5	0.16	6	10		1.2

[a] The residue on day 14 (0.80 mg/kg) exceeded the residue on day 10 (0.62 mg/kg).

Table XI.2. Summary of good agricultural practices for pesticide uses.

(Application on agricultural and horticultural crops)

Responsible body for reporting (name, address): Date:

Pesticide(s) (common name(s)): Page:

CCPR No(s).: Country:

Trade name(s):

Main uses, e.g., insecticide, fungicide:

Use Pattern

Crop and/or situation (a)	F or G (b)	Pest or group of pests) controlled (c)	Formulation		Application			Application rate per treatment			PHI (days) (k)	Remarks (1)
			Type (d-f)	Conc. of ai (i)	method, kind (f-h)	growth stage (j)	number (range)	kg ai/hL	water L/ha	kg ai/ha		

Explanatory notes: (explanatory notes are needed only on page 1 of a multi-page GAP summary)

Include only the information provided on the label.

(a) In case of group of crops the Codex classification should be used
(b) Outdoor or field use (F), or glasshouse application (G)
(c) e.g., biting and sucking insects, soil borne insects, foliar fungi
(d) e.g., wettable powder (WP), emulsifiable concentration (EC), granule (GR)
(e) Use CIPAC/FAO Codes where appropriate
(f) All abbreviations used must be explained
(g) Method, e.g., high volume spraying, low volume spraying, spreading, dusting, drench
(h) Kind, e.g., overall, broadcast, aerial spraying, row, individual plant, between the plants
(i) g/kg or g/l
(j) Growth stage at last treatment
(k) PHI = Pre-harvest interval
(l) Remarks may include: Extent of use/economic importance/restrictions (e.g., feeding, grazing)/minimal intervals between applications)

Table XI.3. Residues data summary from supervised trials
(Application on agricultural and horticultural crops)

Active ingredient:
Responsible body for reporting (name, address):
Country:
Content of ai (g/kg or g/l):
Formulation (e.g., WP):
Commercial product (name):
Producer of commercial product

Crop/crop group:
Submission date:
Page:
Indoor/outdoor:
Other ai in formulation:
(Common name and content):
Residues calculated as:

Report-No.: Location incl. Postal code	Crop Variety	Date of (1) Sowing or planting; (2) Flowering or (3) Harvest (b)	Application rate per treatment			Dates of treatment(s) or no. of treatments and last date	Growth stage at last treatment or date	Commodity, Portion analysed (a)	Residues (mg/kg)	**PHI** days) **(d)**	Remarks (e)
			kg ai/ha	water L/ha	kg ai/hL						

Explanatory notes: (explanatory notes are needed only on page 1 of a multi-page residue data summary)
(a) According to Codex Classification/Guide
(b) Only if relevant
(c) Year must be indicated
(d) Days after last application (Label pre-harvest interval, PHI, underline)
(e) Remarks may include: Climatic conditions; Reference to analytical method and information on which metabolites are included
Note: All entries to be filled in as appropriate

Table XI.4. Table format for long-term dietary intake calculation (parathion-methyl example).

BUPROFEZIN (173) International Estimated Daily Intake (IEDI) ADI = 0 - 0.009 mg/kg bw

Codex Code	Commodity	STMR or STMR-P mg/kg	diet correction factor	Diets: g/person/day / Intake = daily intake: µg/person											
				A diet	intake	B diet	intake	C diet	intake	D diet	intake	E diet	intake	F diet	intake
FC 0001	Citrus fruit (excl lemon juice, excl mandarin juice, excl orange juice, excl grapefruit juice, excl NES juice)	0.04	0.7	15.7	0.4	86.5	2.4	52.6	1.5	24.2	0.7	16.2	0.5	12.0	0.3
-	Citrus juice NES	0.13	1	0.0	0.0	1.7	0.2	0.1	0.0	0.0	0.0	1.1	0.1	0.3	0.0
VC 0424	Cucumber	0.035	1	0.3	0.0	12.7	0.4	5.9	0.2	11.5	0.4	6.1	0.2	7.1	0.2
JF 0203	Grapefruit juice	0.13	1	0.0	0.0	0.2	0.0	0.1	0.0	0.1	0.0	1.1	0.1	0.2	0.0
-d	Lemon juice	0.13	1	0.0	0.0	0.9	0.1	0.1	0.0	0.0	0.0	0.2	0.0	0.4	0.1
-	Mandarin + mandarin-like hybrid juice	0.13	1	0.0	0.0	1.4	0.2	0.9	0.1	0.4	0.1	0.7	0.1	0.9	0.1
FI 0345	Mango (incl juice, incl pulp)	0.01	0.7	6.3	0.0	1.0	0.0	4.6	0.0	0.2	0.0	0.7	0.0	0.3	0.0
JF 0004	Orange juice	0.13	1	0.0	0.0	2.1	0.3	4.4	0.6	1.4	0.2	16.2	2.1	22.6	2.9
VO 0448	Tomato (excl juice, excl paste, excl peeled)	0.24	1	1.3	0.3	178.4	42.8	102.8	24.7	53.4	12.8	1.6	0.4	0.0	0.0
JF 0448	Tomato juice	0.053	1	5.2	0.3	0.5	0.0	0.4	0.0	2.1	0.1	6.9	0.4	15.2	0.8
-d	Tomato paste	0.22	1	0.5	0.1	1.3	0.3	3.5	0.8	1.0	0.2	3.8	0.8	4.5	1.0
-d	Tomato, peeled	0.041	1	0.1	0.0	0.4	0.0	0.5	0.0	0.4	0.0	4.9	0.2	3.2	0.1
	Total intake (µg/person)=				1.2		46.8		27.9		14.5		5.0		5.7
	Body weight per region (kg bw) =				60		60		60		60		60		60
	ADI (µg/person)=				540		540		540		540		540		540
	%ADI=				0.2%		8.7%		5.2%		2.7%		0.9%		1.1%
	Rounded %ADI=				0%		9%		5%		3%		1%		1%

Note: Only the first 6 regional diets are shown in the example table.

Table XI.5. Table format for long-term dietary intake calculation (myclobutanil example).

MYCLOBUTANIL (181): daily intake estimate (mixed TMDI-IEDI calculation). ADI = 0.03 mg/kg bw or 1800 µg/person

Code	Commodity	MRL mg/kg	STMR or STMR-P mg/kg
FI 0327	Banana		0.15
MM 0812	Cattle meat	0.01*	
ML 0812	Cattle milk	0.01*	
MO 0812	Cattle, Edible offal of	0.01*	
FB 0278	Currant, black		0.26
PE 0112	Eggs	0.01*	
FB 0269	Grapes	1	
DH 1100	Hops, dry		0
FS 0014	Plums (including prunes)	0.2	
FP 0009	Pome fruits	0.5	
PM 0110	Poultry meat	0.01*	
PO 0111	Poultry, edible offal of	0.01*	
DF 0014	Prunes	0.5	
FS 0012	Stone fruits [a]		0.62
FB 0275	Strawberry		0.19
VO 0448	Tomato		0.06
	Tomato juice		0.05
	Tomato paste		0.02

* at or about LOQ

[a] except plums

As the diet table contains entries for (1) Stone fruit (excl dried plums, including dried apricots) and (2) Plum (excluding dried), the correct consumption figures for stone fruits can be obtained as: stone fruits excluding plums and prunes = (2) - (1). The values calculated for the 13 regional diets shall be inserted in the Excel spreadsheet. Attention: the new values shall be inserted in the appropriate cell one by one making sure that the formula in the intake columns are not affected.

The results of the calculation for the first 6 diets are shown below:

Myclobutanil () International Estimated Daily Intake (IEDI) ADI = 0 - 0.0300 mg/kg bw

Codex Code	Commodity	STMR or STMR-P mg/kg	Diets: g/person/day Intake = daily intake: µg/person											
			A		B		C		D		E		F	
			diet	intake	diet	intake	diet	intake	diet	intake	diet	intake	diet	intake
FI 0327	Banana	0.15	38.8	5.8	17.4	2.6	16.0	2.4	6.6	1.0	21.5	3.2	33.8	5.1
MM 0812	Cattle meat (incl calf meat)	0.01	13.4	0.1	49.4	0.5	13.6	0.1	35.8	0.4	42.4	0.4	53.9	0.5
ML 0812	Cattle milk (excl processed products)	0.01	34.5	0.3	178.5	1.8	52.0	0.5	284.2	2.8	178.6	1.8	237.1	2.4
MO 0812	Cattle, edible offal of	0.01	2.5	0.0	8.8	0.1	1.8	0.0	6.3	0.1	4.6	0.0	4.0	0.0
FB 0278	Currants, black	0.26	0.0	0.0	0.0	0.0	0.0	0.0	1.1	0.3	1.6	0.4	1.0	0.3
PE 0112	Eggs	0.01	2.5	0.0	29.7	0.3	25.1	0.3	24.5	0.2	37.8	0.4	27.4	0.3
FB 0269	Grape (incl dried, incl juice, incl wine)	1	3.7	3.7	128.5	128.5	27.1	27.1	33.1	33.1	107.5	107.5	44.0	44.0
DH 1100	Hops, dry	0	0.1	0.0	0.1	0.0	0.1	0.0	0.1	0.0	0.3	0.0	0.1	0.0
FS 0014	Plum (excl dried)	0.2	0.1	0.0	5.3	1.1	2.5	0.5	7.0	1.4	5.5	1.1	0.9	0.2
DF 0014	Plum, dried (prunes)	0.5	0.0	0.0	0.2	0.1	0.0	0.0	0.1	0.1	0.5	0.3	0.6	0.3
FP 0009	Pome fruit (incl apple juice)	0.5	0.5	0.3	84.1	42.1	21.9	11.0	45.2	22.6	61.7	30.9	46.2	23.1
PM 0110	Poultry meat	0.01	7.1	0.1	58.5	0.6	31.9	0.3	24.0	0.2	61.0	0.6	27.3	0.3
PO 0111	Poultry, edible offal of	0.01	0.4	0.0	0.4	0.0	1.7	0.0	0.1	0.0	0.6	0.0	0.2	0.0
FS 0012	Stone fruit (excl fresh and dried plums, excl dried apricots)	0.62	0.7	0.4	42.7	26.4	13.8	8.5	26.6	16.5	27.0	16.8	9.3	5.8
FB 0275	Strawberry	0.19	0.0	0.0	5.0	1.0	2.0	0.4	1.7	0.3	5.2	1.0	4.1	0.8
VO 0448	Tomato (excl juice, excl paste, excl peeled)	0.06	1.3	0.1	178.4	10.7	102.8	6.2	53.4	3.2	1.6	0.1	0.0	0.0
JF 0448	Tomato juice	0.05	5.2	0.3	0.5	0.0	0.4	0.0	2.1	0.1	6.9	0.3	15.2	0.8
-d	Tomato paste	0.02	0.5	0.0	1.3	0.0	3.5	0.1	1.0	0.0	3.8	0.1	4.5	0.1
	Total intake (µg/person)=			11.2		215.7		57.4		82.3		164.8		83.8
	Bodyweight per region (kg bw) =			60		60		60		60		60		60
	ADI (µg/person)=			1800		1800		1800		1800		1800		1800
	%ADI=			0.6%		12.0%		3.2%		4.6%		9.2%		4.7%
	Rounded %ADI=			1%		10%		3%		5%		9%		5%

Table XI.6. Table format for IESTI calculation for general population (parathion-methyl example).

PARATHION-METHYL (59): international estimate of short-term intake (IESTI) for **GENERAL POPULATION**. ARfD = 0.03 mg/kg bw (30 ug/kg bw)

Code	Commodity	STMR or STMR-P, mg/kg	HR, mg/kg	Large portion diet			Unit weight			Variability factor	Case	IESTI, ug/kg bw	% ARfD, rounded
				Country	Body weight, kg	Large portion, g	Unit weight g	Country	Unit wt, edible portion g				
FP 0226	Apple		0.18	USA	65	1348	110	Fra	100	7	2a	5.4	20
	Apple juice	0.015			60						3		
VD 0071	Beans (dry)		0.05	Fra	62.3	255					1	0.2	1
VB 0041	Cabbages, Head		0.26	Fra	62.3	312	908	USA	717	5	2b	6.5	20
OR 0691	Cotton seed oil, edible	1.16		USA	65	9.1					3	0.2	1
DF 0269	Dried grapes (=Currants ...)		0.70	Fra	62.3	135.2					1	1.5	5
FB 0269	Grapes		0.41	Aus	67	513	125	Fra	118	7	2a	7.5	20
GC 0645	Maize	0.05	0.09	Fra	62.3	260				see maize flour			
CF 1255	Maize flour	0.021		Aus	67	90					3	0.03	0
OR 0645	Maize oil, edible	0.051		Nl	63	43					3	0.03	0
FS 0247	Peach		0.22	Jpn	52.6	626	110	Fra	99	7	2a	5.1	20
VD 0072	Peas (dry)		0.24	Fra	62.3	445					1	1.7	6
VR 0589	Potato		0	NL	63	687	122	USA	99	7	2a	0	0
OR 0495	Rape seed oil, edible	0.10		Aus	67	65					3	0.1	0
GC 0654	Wheat	0.29	4.1	USA	65	383				see wheat bran and flour			
CM 0654	Wheat bran, unprocessed	0.64		Aus	67	37					3	0.35	1
CF 1211	Wheat flour	0.11		USA	65	365					3	0.62	2
											MAX	IESTI =	**20**

Table XI.7. Table format for IESTI calculation for children up to 6 years (parathion-methyl example).

PARATHION-METHYL (59): international estimate of short-term intake (IESTI) for **CHILDREN UP TO 6 YEARS** ARfD = 0.03 mg/kg bw (30 ug/kg bw)

Code	Commodity	STMR or STMR-P, mg/kg	HR, mg/kg	Large portion diet			Unit weight			Variability factor	Case	IESTI, ug/kg bw	% ARfD, rounded
				Country	Body weight, kg	Large portion, g	Unit weight g	Country	Unit wt, edible portion g				
FP 0226	Apple		0.18	USA	15	679	110	Fra	100	7	2a	15.4	50
	Apple juice	0.015			15						3		
VD 0071	Beans (dry)		0.05	Fra	17.8	209					1	0.59	2
VB 0041	Cabbages, Head		0.26	Jpn	15.9	142	908	USA	717	5	2b	11.6	40
OR 0691	Cotton seed oil, edible	1.16		USA	15	6					3	0.48	2
DF 0269	Dried grapes (=Currants ...)		0.70	USA	15	59					1	2.77	9
FB 0269	Grapes		0.41	Aus	19	342	125	Fra	118	7	2a	22.6	80
GC 0645	Maize	0.05	0.09	Fra	17.8	148				see maize flour			
CF 1255	Maize flour	0.021		Aus	19	60					3	0.07	0
OR 0645	Maize oil, edible	0.051		Fra	17.8	21					3	0.06	0
FS 0247	Peach		0.22	Aus	19	307	110	Fra	99	7	2a	10.4	30
VD 0072	Peas (dry)		0.24	Fra	17.8	107					1	1.44	5
VR 0589	Potato		0	UK	14.5	279	122	USA	99	7	2a	0	0
OR 0495	Rape seed oil, edible	0.10		Aus	19	18					3	0.1	0
GC 0654	Wheat	0.29	4.1	USA	15	151				see wheat bran and flour			
CM 0654	Wheat bran, unprocessed	0.64		Aus	19	13					3	0.43	1
CF 1211	Wheat flour	0.11		Aus	19	194					3	1.13	4
												MAX IESTI =	**80**

Appendix XII.

NUMBER OF TRIALS REQUIRED BY OECD MEMBER COUNTRIES

The OECD Working Group on Pesticides elaborated guidance on the minimum number of trials which should be generated for registration of a pesticide in all OECD countries where the target GAP is uniform, i.e., maximum 25% deviation in one of the key parameters. The underlying principles of the proposed scheme are basically applicable for the purpose of the JMPR as well. The assumption is that the number of trials specified in each crop production region reflects the economic (acreage) importance and/or dietary significance of the crop within that production region. Therefore, there is no need to further consider acreage or dietary intake for a crop/commodity or to determine whether a crop is major or minor in terms of acreage, diet, or trade on a global basis for the purpose of determining a minimum number of crop field trials for a comprehensive submission.

The reduction in the total number of trials within any OECD country or crop production region is compensated for by the total number of crop field trials making up the comprehensive submission data set and the wider geographic distribution of these data.

To qualify for this comprehensive submission approach, all crop field trials must meet the following criteria:

a. Field trials are conducted according to the *c*GAP (within +/- 25% of the application rate, number of applications or PHI). At least 50% of the trials must be conducted at or above (within 25%) the *c*GAP. For this purpose, trials whose intended application rates match the cGAP but actual rates fall up to 10% below the *c*GAP, e.g., due to the normal variability in preparing spray solutions, are considered acceptable. In addition, some of the trials need to be decline studies depending on national requirements.

b. The trials span a range of representative crop production practices for each crop including those likely to lead to the highest residues, e.g., irrigated vs. non-irrigated, trellis vs. non-trellis production, fall-planted vs. spring-planted.

Any reduction in the number of crop field trials should be distributed proportionally among the crop production regions as shown in the example for a 40% reduction for barley below (Table XII.1). A table with trial numbers for crops grown throughout OECD countries is given in Table XII.2. In the event that the number of required trials changes in any given region, the total number and reduced number should be adjusted accordingly.

Table XII.1. Example for calculation of minimum number of trials depending on the crop production regions

Country/Region	USA/CAN	EU	JP	AUS	NZ	Total
Number required by legislation	24	16	2	8	4	54
Number with 40% reduction	14	10	2	5	2	33

In no case may the number of trials in a given crop production region be reduced below 2. Thus, in the example in Table 3.7 the 40% reduction does not apply in Japan and therefore the total number of trials is 33 rather than 32, which is the actual 40% reduction from 54.

The minimum total number of trials for any crop in a comprehensive submission is eight. In addition, the total number of trials to be conducted may not be less than the requirement for any given individual region.

The Table XII.2 addresses only outdoor crop field trials and not greenhouse (glasshouse) or post-harvest treatments. For a comprehensive submission with similar critical GAPs, a minimum of eight greenhouse trials is needed. For such greenhouse trials, geographic distribution typically is not an issue. However for active ingredients which are susceptible to photodegradation, consideration should be given to locations at different latitudes.

The number of post-harvest trials on a commodity should be at least four, taking into consideration the application techniques, storage facilities, and packaging materials used. At least three samples should be collected and analysed in studies on bulk and bagged commodities.

Table XII.2 Minimum number of Supervised Field Trials Required at *c*GAP for Field (or Outdoor) Uses

Number of trials currently required by region							Number of Trials Required by Region with 40% Reduction					
	NAFTA	EU	JP	AUS	NZ	Total	NAFTA	EU	JP	AUS	NZ	Total
Acerola (Barbados cherry)	1	4	2			7	1	2	2			5
Alfalfa	18	12	2		4	36	11	7	2		2	22
Almond	5	4	2	6	2	19	3	2	2	4	2	13
Apple	20	16	2	8	6	52	12	10	2	**5**	4	33
Apple, Sugar	2	4	2			8	2	2	2			6
Apricot	7	12	2	6	2	29	4	7	2	4	2	19
Arracacha	2	4	2			8	2	2	2			6
Artichoke, Globe	3	4	2		2	11	2	2	2		2	8
Artichoke, Jerusalem	3	4	2		2	11	2	2	2		2	8
Asparagus	10	8	2	4	4	28	6	5	2	2	2	17
Atemoya	1	4	2		2	9	1	2	2		2	7
Avocado	5	4_	2	8	2	21	3	2	2	5	2	14
Banana	5	4	2	8		19	3	2	2	5		12
Barley	24	16	2	8	4	54	14	10	2	5	2	33
Bean, Dried	12	16	2		2	32	7	10	2		2	21
Bean, Edible Podded	9	16	2		4	31	5	10	2		2	19
Bean, Lima, Dried	3	16	2		2	23	2	10	2		2	16
Bean, Lima, Green	8	8	2	8	2	28	5	5	2	5	2	19
Bean, Mung	3	16	2		2	23	2	10	2		2	16
Bean, Snap	8	16	2		2	28	5	10	2		2	19
Bean, Succulent Shelled	8	16	2		2	28	5	10	2		2	19
Beet, Garden	8	4	2		2	16	5	2	2		2	11
Blackberry	5	4	2		2	13	3	2	2		2	9
Blueberry	11	4	2	4	2	23	7	2	2	2	2	15
Bok choi	2	4	2		2	10	2	2	2		2	8
Boysenberry	2	8	2		2	14	2	5	2		2	11
Broccoli	12	8	2	8	4	34	7	5	2	5	2	21
Broccoli, Chinese (gal Ion)	2	8	2		2	14	2	5	2		2	11
Brussels Sprouts	5	12	2	4	2	25	3	7	2	2	2	16
Buckwheat	9	8	2		2	21	5	5	2		2	14
Cabbage	12	12	2	8	4	38	7	7	2		2	23
Cabbage, Chinese	5	8	2		2	17	3	5	2		2	12

Number of trials currently required by region							Number of Trials Required by Region with 40% Reduction					
	NAFTA	EU	JP	AUS	NZ	Total	NAFTA	EU	JP	AUS	NZ	Total
Cacao Bean (cocoa)	3	8	2			13	2	5	2			9
Calabaza	2	4	2				2	2	2			6
Calamondin	1	4	2			7	1	2	2			5
Canary seed	5	4					3	2	2			7
Canola	22	12	2	8	2	46	13	7	2	5	2	29
Cantaloupe	8	12	2	8	2	32	5	7	2	5	2	21
Carambola	2	4	2		2	10	2	2	2		2	8
Caraway seed	2	4				6	2	2	2			6
Carob	3	4	2			9	2	2	2			6
Carrot	12	16	2	8	4	42	7	10	2	5	2	26
Cassava, bitter or sweet	2	4	2		2	10	2	2	2		2	8
Cauliflower	11	12	2	8	2	35	7	7	2	5	2	23
Celery	12	8	2	4	4	30	7	5		2	2	18
Cherry, Sweet	9	4	2	3	4	22	5	2	2	2	2	13
Cherry, Tart (Sour)	8	4	2	3	2	19	5	2	2	2	2	13
Chestnut	3	4	2	4	2	15	2	2	2	2	2	8
Chickpea (garbanzo bean)	3	16	2	4	2	27	2	10	2	2	2	18
Chicory	2	8	2		2	14	2	5	2		2	11
Clover	12	12	2		4	30	7	7	2		2	18
Coconut	5	4	2			11	3	2	2			7
Coffee	5	4	2	4		15	3	2	2	2		9
Collards	5	8	2		2	17	3	5	2		2	12
Corn, Field	20	16	2	2	4	44	12	10	2	2	2	28
Corn, Pop	3		2			5	2	0	2			4
Corn, Sweet	14	8	2	6	2	32	8	5	2	4	2	21
Cotton	12	8	2	8		30	7	5	2	5		19
Cowpea (dried shelled bean)	5	16	2		2	25	3	10	2		2	17
Cowpea (forage/hay)	3	12	2		2	19	2	7	2		2	13
Cowpea, (succulent, shelled bean)	3	8	2		2	15	2	5	2		2	11
Crabapple	3	8	2		2	15	2	5	2		2	11
Cranberry	6	4	2		2	14	4	2	2		2	10
Cress, Upland	1	4	2			7	1	2	2			5
Cucumber	11	16	2	4	4	37	7	10	2	2	2	23
Currant	2	8	2		2	14	2	5	2		2	11

Number of trials currently required by region							Number of Trials Required by Region with 40% Reduction					
	NAFTA	EU	JP	AUS	NZ	Total	NAFTA	EU	JP	AUS	NZ	Total
Dandelion	1	8	2		2	13	1	5	2		2	10
Dasheen (taro)	2	4	2		2	10	2	2	2		2	8
Date	3	4	2			9	2	2	2			6
Dill (dill seed, dillweed)	2	8	2		2	14	2	5	2		2	11
Eggplant	3	8	2		2	15	2	5	2		2	11
Elderberry	3	4	2		2	11	2	2	2		2	8
Endive (escarole)	3	4	2		2	11	2	2	2		2	8
Fennel		8	2			10		5	2			7
Fig	3	4	2		2	11	2	2	2		2	8
Filbert (hazelnut)	5	4	2		2	13	3	2	2		2	9
Flax (= linseed)	10	8	2		2	22	6	5	2		2	15
Fodder beet	0	8	2		4	14	0	5	2		2	9
Garlic	3	8	2		2	15	2	5	2		2	11
Genip	1	4	2			7	1	2	2			5
Ginger	2	4	2			8	2	2	2			6
Ginseng	5	4	2			11	3	2	2			7
Gooseberry	3	4	2		2	11	2	2	2		2	8
Grape	16	16	2		6	40	10	10	2		4	26
Grape, table		12	2	8	4	26		7	2	5	2	16
Grapefruit	8	4	2	2	2	18	5	2	2	2	2	13
Grasses	12	16	2		4	34	7	10	2		2	21
Guar	3	4	2			9	2	2		2_		6
Guava	2	4	2		2	10	2	2	2		2	8
Herbs		4	2			6		2	2			4
Hops	3	12	2		2	19	2	7	2		2	13
Horseradish	3	4	2		2	11	2	2	2		2	8
Huckleberry	3	4	2		2	11	2	2	2		2	8
Kale	3	12	2		2	19	2	7	2		2	13
Kiwi fruit	3	4	2		6	15	2	2	2		4	10
Kohlrabi	3	8	2		2	15	2	5	2		2	11
Kumquat	1	4	2		2	9	1	2	2		2	7
Leek	5	12	2	4	2	25	3	7	2	2	2	16
Lemon	5	8	2	6	2	23	3	5	2	4	2	16
Lentil	8	4	2		2	16	5	2	2		2	11
Lettuce, Head	13	8	2	8	3	34	8	5	2	5	2	22

Number of trials currently required by region							Number of Trials Required by Region with 40% Reduction					
	NAFTA	EU	JP	AUS	NZ	Total	NAFTA	EU	JP	AUS	NZ	Total
Lettuce, Leaf	13	8	2	8	3	34	8	5	2	5	2	22
Lime	3	4	2		2	11	2	2	2		2	8
Loganberry	2	8	2		2	14	2	5	2		2	11
Longan	1	4	2			7	1	2	2			5
Lotus Root	1	4	2			7	1	2	2			5
Lychee	1	4	2	2		9	1	2	2	2		7
Macadamia Nut	3	4	2	6	2	17	2	2	2	4	2	12
Mamey Sapote	2	4	2			8	2	2	2			6
Mandarin (tangerine)	5	8	2	8	4	27	3	5	2	5	2	17
Mango	3	4	2	8		17	2	2	2	5		11
Melon	3	12	2		2	19	2	7	2		2	13
Melon, Casaba	3	12	2		2	19	2	7	2		2	13
Melon, Crenshaw	3	12	2		2	19	2	7	2		2	13
Melon, Honeydew	5	12	2		2	21	3	7	2		2	14
Millet, Proso	8	8	2		2	20	5	5	2		2	14
Mint	5	8	2		2	17	3	5	2		2	12
Mulberry	3	8	2			13	2	5	2			9
Mushrooms	3	8	2	6	2	21	2	5	2	4		13
Muskmelons	8	12	2		2	24	5	7	2		2	16
Mustard Greens	8	8	2		2	20	5	5	2		2	14
Mustard, Chinese	2	8	2		2	14	2	5	2		2	11
Mustard seed	5	8				13	3	5	2			10
Nectarine	10	12	2	8	2	34	6	7	2	5	2	22
Oat	26	16	2	6	2	52	16	10	2	4	2	34
Okra	5	4	2		2	13	3	2	2		2	9
Olive	3	8	2		2	15	2	5	2		2	11
Onion, Dry Bulb	12	16	2	8	4	42	7	10	2	5	2	26
Onion, Green	5	8	2	4	2	21	3	5	2	2	2	14
Orange, Sour and Sweet	16	8	2	8	4	38	10	5	2	5	2	24
Papaya	3	4	2			9	2	2	2			6
Parsley	3	4	2	2	2	13	2	2	2	1	2	9
Parsnip	6	8	2		2	18	4	5	2		2	13
Passion Fruit	2	4	2		2	10	1	2	2		2	7
Pawpaw	3	4	2			9	2	2	2			6
Pea, Chinese	1	8	2		2	13	1	5	2		2	10

Number of trials currently required by region							Number of Trials Required by Region with 40% Reduction					
	NAFTA	EU	JP	AUS	NZ	Total	NAFTA	EU	JP	AUS	NZ	Total
Pea, Dried Shelled	13	16	2	8	2	41	8	10	2	5	2	27
Pea, Edible podded	8	12	2	6	2	30	5	7	2	4	2	20
Pea, Edible Podded	3	8	2		2	15	2	5	2		2	11
Pea, Field (Austrian Winter) (forage/hay)	3	12	2	8	2	27	2	7	2	5	2	18
Pea, Succulent Shelled (Pea, Garden, Succulent)	14	12	2		2	30	8	7	2		2	19
Peach	16	12	2	8	4	42	10	7	2	5	2	26
Peanut	12	4	2	8		26	7	2	2	5		16
Peanut, Perennial	3	4	2			9	2	2	2			6
Pear	11	16	2	8	4	41	7	10	2	5	2	26
Pecan	5	4	2	4	2	17	3	2	2	2	2	11
Pepper, (other than bell)	3	4	2		2	11	2	2	2		2	8
Pepper, Bell	12	12	2		2	28	7	7	2		2	18
Persimmon	3	4	2		4	13	2	2	2		2	8
Pimento	2	4	2		2	10	2	2	2		2	8
Pineapple	8	4	2			14	5	2	2			9
Pistachio	3	4	2			9	2	2	2			6
Plantain	3	4	2			9	2	2	2			6
Plum	11	12	2	8	2	35	7	7	2	5	2	23
Pomegranate	3	4	2			9	2	2	2			6
Potato	26	16	2	8	4	56	16	10	2	5	2	35
Pumpkin	8	8	2	4	2	24	5	5	2	2	2	16
Quince	3	4	2		2	11	2	2	2		2	8
Radish	7	8	2		2	19	4	5	2		2	13
Radish, Oriental (daikon)	2	4	2		2	10	2	2	2		2	8
Rapeseed	3	12	2		2	19	2	7	2		2	13
Raspberry, Black and Red	6	4	2		2	14	4	2	2		2	10
Rhubarb	5	4	2		2	13	3	2	2		2	9
Rice	16	8	2	6		32	10	5	2	4		21
Rice, Wild	5	8	2			15	3	5	2			10
Rutabaga	8	8	2		2	20	5	5	2		2	14
Rye	10	16	2		2	30	6	10	2		2	20
Safflower	6	8	2		2	18	4	5	2		2	13
Sainfoin	3	12	2		2	19	2	7	2		2	13

Number of trials currently required by region							Number of Trials Required by Region with 40% Reduction					
	NAFTA	EU	JP	AUS	NZ	Total	NAFTA	EU	JP	AUS	NZ	Total
Salsify	3	8	2		2	15	2	5	2		2	11
Saskatoons	2	4				6	2	2	2			6
Sesame	3	4	2			9	2	2	2			6
Shallot	3	8	2		2	15	2	5	2		2	9
Sorghum, Grain	12	8	2	6	2	30	7	5	2	4	2	20
Soybean (dried)	20	12	2	8	4	46	12	7	2	5	2	28
Spices		4	2			6		2	2			4
Spinach	11	8	2		2	23	7	5	2		2	16
Squash, Summer	11	8	2		4	25	7	5	2		2	16
Squash, Winter	5	8	2		2	17	3	5	2		2	12
Strawberry	10	16	2	8	4	40	6	10	2	5	2	25
Sugar Beet	14	16	2	2		34	8	10	2	2		22
Sugarcane	8	4	2	8		22	5	2	2	5		14
Sunflower	10	12	2	8	2	34	6	7	2	5	2	22
Sweet Potato	8	4	2		2	16	5	2	2		2	11
Chard Swiss	3	4	2		2	11	2	2	2		2	8
Tangelo	3	4	2		2	11	2	2	2		2	8
Tanier (cocoyam)	2	4	2			8	2	2	2			6
Tea		4	2			6		2	2			4
Tobacco	8	4	2		2	16	5	2	2		2	11
Tomato	27	16	2	8	4	57	16	10	2	5	2	35
Triticale	5	16	2	4	2	29	3	10	2	2	2	19
Turnip, root	5	4	2		4	15	3	2	2		2	9
Turnip, tops (leaves)	5	4	2		2	13	3	2	2		2	9
Walnut, Black and English	3	8	2		2	15	2	5	2		2	11
Watercress	2	4	2		2	10	2	2	2		2	8
Watermelon	8	4	2	4	2	20	5	2	2	2	2	13
Wheat	33	16	2	12	4	67	20	10	2	7	2	41
Yam, True	3	4	2		2	11	2	2	2		2	8

Appendix XIII.

CRITICAL VALUES FOR MANN-WHITNEY U-TEST AT A_2=0.05

n_1 and n_2 are the number of data points in residue data sets 1 and 2 respectively, where n_1 is the smaller when the sample sizes are different. If the calculated U_1 statistics is greater than the tabulated critical value, it indicates that the samples probably came from populations with the same median. (The two populations are not different.)

n_1	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	**14**	**15**	**16**	**17**	**18**	**19**	**20**	**21**	**22**	**23**	**24**	**25**
n_2																							
4	-	0																					
5	0	1	2																				
6	1	2	3	5																			
7	1	3	5	6	8																		
8	2	4	6	8	10	13																	
9	2	4	7	10	12	15	17																
10	3	5	8	11	14	17	20	23															
11	3	6	9	13	16	19	23	26	30														
12	4	7	11	14	18	22	26	29	33	37													
13	4	8	12	16	20	24	28	33	37	41	45												
14	5	9	13	17	22	26	31	36	40	45	50	55											
15	5	10	14	19	24	29	34	39	44	49	54	59	64										
16	6	11	15	21	26	31	37	42	47	53	59	64	70	75									
17	6	11	17	22	28	34	39	45	51	57	63	69	75	81	87								
18	7	12	18	24	30	36	42	48	55	61	67	74	80	86	93	99							
19	7	13	19	25	32	38	45	52	58	65	72	78	85	92	99	106	113						
20	8	14	20	27	34	41	48	55	62	69	76	83	90	98	105	112	119	127					
21	8	15	22	29	36	43	50	58	65	73	80	88	96	103	111	119	126	134	142				
22	9	16	23	30	38	45	53	61	69	77	85	93	101	109	117	125	133	141	150	158			
23	9	17	24	32	40	48	56	64	73	81	89	98	106	115	123	132	140	149	157	166	175		
24	10	17	25	33	42	50	59	67	76	85	94	102	111	120	129	138	147	156	165	174	183	192	
25	10	18	27	35	44	53	62	71	80	89	98	107	117	126	135	145	154	163	173	182	192	201	211