codex alimentarius commission

FOOD AND AGRICULTURE ORGANIZATION OF THE UNITED NATIONS

WORLD HEALTH ORGANIZATION

JOINT OFFICE: Viale delle Terme di Caracalla 00100 ROME Tel: 39 06 57051 www.codexalimentarius.net Email: codex@fao.org Facsimile: 39 06 5705 4593

ALINORM 03/24

JOINT FAO/WHO FOOD STANDARDS PROGRAMME
CODEX ALIMENTARIUS COMMISSION
Twenty-fifth Session
Rome, Italy 30 June - 5 July 2003

REPORT OF THE THIRTY-FOURTH SESSION OF THE CODEX COMMITTEE ON PESTICIDE RESIDUES
The Hague, The Netherlands 13 - 18 May 2002

Note: This report includes Codex Circular Letter CL 2002/16-PR.

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CX 4/40.2 **CL 2002/16-PR**
May 2002

TO: - Codex Contact Points
- Interested International Organizations

FROM: Secretary, Codex Alimentarius Commission
FAO, Viale delle Terme di Caracalla, 00100 Rome, Italy

SUBJECT: DISTRIBUTION OF THE REPORT OF THE THIRTY-FOURTH SESSION OF THE CODEX COMMITTEE ON PESTICIDE RESIDUES (ALINORM 03/24)

The report of the Thirty-fourth Session of the Codex Committee on Pesticide Residues will be considered by the 25th Session of the Codex Alimentarius Commission (Rome, 30 June - July 2003).

PART A: MATTERS FOR ADOPTION BY THE 25TH SESSION OF THE CODEX ALIMENTARIUS COMMISSION

The following matters will be brought to the attention of the 25th Session of the Codex Alimentarius Commission for adoption:

1. DRAFT AND DRAFT REVISED MAXIMUM RESIDUE LIMITS AT STEP 8 AND STEP 5/8 (ALINORM 03/24, APPENDIX II); AND

2. PROPOSED DRAFT AMENDMENTS TO THE INTRODUCTION SECTION OF THE RECOMMENDED METHODS OF ANALYSIS FOR PESTICIDE RESIDUES AT STEP 5/8 (ALINORM 03/24, APPENDIX V).

Governments wishing to propose amendments or to comment on the Draft MRLs and Proposed Draft MRLs at Steps 8 and 5/8; and Proposed Draft Amendments to the Introduction Section of the Recommended Methods of Analysis for Pesticide Residues at Step 5/8 should do so in writing in conformity with the Guide to the Consideration of Standards of the Procedure for the Elaboration of Codex Standards Including Consideration of Any Statements Relating to Economic Impact (*Codex Alimentarius Procedural Manual*, Twelfth Edition) to the Secretary, Codex Alimentarius Commission, FAO, Viale delle Terme di Caracalla, 00100 Rome, Italy (fax, +39 06 57054593; e-mail, codex@fao.org), **not later than 31 March 2003**.

3. REVOCATION OF CODEX MRLS (ALINORM 03/24, APPENDIX IV)

Governments wishing to comment on the proposed revocation (not including that of Codex MRLs replaced by the revised MRLs) should do so in writing to the Secretary, Codex Alimentarius Commission, FAO, Viale delle Terme di Caracalla, 00100 Rome, Italy (fax: +39 06 57054593; e-mail, codex@fao.org), **not later than 31 March 2003**.

PART B: MATTERS FOR ADOPTION BY THE 50TH SESSION OF THE EXECUTIVE COMMITTEE

1. PROPOSED DRAFT AND PROPOSED DRAFT REVISED MAXIMUM RESIDUE LIMITS AT STEP 5 (ALINORM 03/24, APPENDIX III)

Governments wishing to propose amendments or to submit comments regarding the implications which the Proposed Draft Maximum Residue Limits may have for their economic interest should do so in writing in conformity with the Procedures for the Elaboration of Codex Standards and Related Texts (at Step 5) (*Codex Alimentarius Procedural Manual*, Twelfth Edition) to the Secretary, Codex Alimentarius Commission, FAO, Viale delle Terme di Caracalla, 00100 Rome, Italy (fax, +39 06 57054593; e-mail, codex@fao.org), **not later than 15 June 2002**.

2. PROPOSED DRAFT REVISION OF THE GUIDELINES ON GOOD LABORATORY PRACTICE IN PESTICIDE RESIDUE ANALYSIS AT STEP 5 (ALINORM 03/24, APPENDIX VI)

Governments wishing to propose amendments or to submit comments regarding the implications which the Proposed Draft Maximum Residue Limits may have for their economic interest should do so in writing in conformity with the Procedures for the Elaboration of Codex Standards and Related Texts (at Step 5) (*Codex Alimentarius Procedural Manual*, Twelfth Edition) to the Secretary, Codex Alimentarius Commission, FAO, Viale delle Terme di Caracalla, 00100 Rome, Italy (fax, +39 06 57054593; e-mail, codex@fao.org), **not later than 15 June 2002**.

PART C: REQUEST FOR COMMENTS:

1. MATTERS RELATED TO METHODS OF ANALYSIS FOR PESTICIDE RESIDUES

1.1 REVISION OF THE LIST OF METHODS OF ANALYSIS FOR PESTICIDE RESIDUES

While considering the discussion paper on the Revision of the List of Methods of Analysis for Pesticide Residues (see para. 65), the Committee supported the recommendation of the *Ad Hoc* Working Group relevant to this Agenda Item and agreed to request Member Governments and interested observer organizations to provide descriptions of their methods together with their scope and supporting validation data, if available, as applied for the determination of the pesticides in the check list. This information should be sent to Dr. Piet VAN ZOONEN, Head of Laboratory, National Institute of Public Health and the Environment, P.O. Box 1, 3720 BA Bilthoven, Fax: +31 30 274 4424, e-mail: piet.van.zoonen@rivm.nl with a copy to the Secretary, Codex Alimentarius Commission, FAO, Viale delle Terme di Caracalla, 00100 Rome, Italy (fax: +39 06 57054593; e-mail: codex@fao.org), **not later than 15 December 2002**.

1.2 MULTI-COMPONENT ANALYSIS IN THE ESTIMATION OF UNCERTAINTY

The Committee agreed that problems of multi-component analysis in the Estimation of Uncertainty of Results Based on the Analysis of Multiple Peaks needed to be discussed further in connection with the EU document on new options for estimation of uncertainty therefore Member Governments and interested international organizations are invited to provide information in this regard (see para 166). This information should be sent to Dr Arpad AMBRUS, Head, Agrochemicals Unit, FAO/IAEA Agriculture and Biotechnology Laboratory, Agency's Laboratories (Seibersdorf and Headquarters), Department of Nuclear Sciences and Applications, Fax: + 43 1 2600-28222, E-mail: A.Ambrus@iaea.org with a copy to the Secretary, Codex Alimentarius Commission, FAO, Viale delle Terme di Caracalla, 00100 Rome, Italy (fax: +39 06 57054593; e-mail: codex@fao.org), **not later than 15 December 2002**.

1.3 IDENTIFICATION OF SPECIFIC RECOMMENDATIONS FOR COMMODITIES

The Committee noted the need for specific recommendations for commodities such as jack fruit, durian, lychee, etc and decided to ask proposals for the identification of tropical fruits and vegetables for which the Member States would like to establish national and Codex MRLs (see para 167). These proposals should be supported with detailed descriptions of the commodity, portion to which the MRL applied and

current sample preparation practice. This information should be sent to Dr. Piet VAN ZOONEN, Head of Laboratory, National Institute of Public Health and the Environment, P.O. Box 1, 3720 BA Bilthoven, Fax: +31 30 274 4424, e-mail: piet.van.zoonen@rivm.nl with a copy to the Secretary, Codex Alimentarius Commission, FAO, Viale delle Terme di Caracalla, 00100 Rome, Italy (fax: +39 06 57054593; e-mail: codex@fao.org), **not later than 15 December 2002**.

2. DRAFT AND PROPOSED DRAFT MRLS AT STEPS 6 AND 3[1]

Governments and interested international organizations are invited to comment on the draft MRLs and proposed draft MRLs as contained in Annex II of this report at Steps 6 and 3. Comments should be sent in writing in conformity with the Uniform Procedure for the Elaboration of Codex Standards and Related Texts at Steps 3 and 6 including possible implications of the proposed draft MRLs for their economic interests (*Codex Alimentarius Procedural Manual*, Twelfth Edition) preferably by an email to Dr Hans JEURING, Inspectorate for Health Protection and Veterinairy Public Health Ministry of Health, Welfare and Sport, PO Box 16108, 2500 BC Den Haag, Fax:+31 70 340 5435, E-mail: hans.jeuring@kvw.nl), with a copy to the Secretary, Codex Alimentarius Commission, FAO, Viale delle Terme di Caracalla, 00100 Rome, Italy (fax: +39 06 57054593; e-mail: codex@fao.org), **not later than 15 January 2005**.

3. REVISION OF THE CODEX CLASSIFICATION OF FOODS AND ANIMAL FEEDS

While considering the Discussion paper on the Need for the Revision of the Codex Classification of Foods and Animal Feeds (see paras 245 - 249), the Committee agreed to ask information to what extent the Classification should be updated and what new commodities should be added. This information should be sent to Dr Hans JEURING, Inspectorate for Health Protection and Veterinairy Public Health Ministry of Health, Welfare and Sport, PO Box 16108, 2500 BC Den Haag, Fax:+31 70 340 5435, E-mail: hans.jeuring@kvw.nl), with a copy to the Secretary, Codex Alimentarius Commission, FAO, Viale delle Terme di Caracalla, 00100 Rome, Italy (fax: +39 06 57054593; e-mail: codex@fao.org), **not later than 15 November 2002**.

4. NEW TOXICOLOGICAL DATA FOR PERSISTENT PESTICIDES

While considering periodic review for pesticides for which EMRLs had been established (for details see paras 173-175), the Committee **agreed** to request information on the availability of new toxicological and monitoring data for persistent pesticides. The Committee emphasized that re-evaluations should be based on *new* monitoring data that have been generated since the last evaluation because older monitoring data would not be representative of the present situation and therefore would not serve as a good basis for re-evaluation. This information should be sent to Dr Trevor DOUST, Manager – Chemistry and Residues Evaluation, National Registration Authority for Agricultural and Veterinary Chemicals, PO Box E 240, KINGSTON, ACT 2604, Fax: +61 2 6272 3551, Email: tdoust@nra.gov.au with a copy to the Secretary, Codex Alimentarius Commission, FAO, Viale delle Terme di Caracalla, 00100 Rome, Italy (fax: +39 06 57054593; e-mail: codex@fao.org), **not later than 15 December 2002**.

5. REVISION OF THE CODEX CLASSIFICATION OF FOODS AND ANIMAL FEEDS

While considering the discussion paper on the Need for the Revision of the Codex Classification of Foods and Animal Feeds (for details see paras 211-216), Committee noted that before proceeding with the revision there should be a clear understanding on the terms of reference for the revision and that practical technical problems such as the availability of electronic version of Classification should be solved therefore decided to request comments/information on the following matters:

- how the revision could be undertaken practically,
- commodities be added and what should be criteria for the addition of commodities,
- to which extent classification should be up-dated for reasons of extrapolation and harmonization,
- what the impact of the revision would be on the existing CXLs, and
- what were be resource implications?

[1] For proposed draft MRLs to be adopted by the 50th Sesion of the Executive Committee (26-28 June 2002) a separate CL will be issued.

- iclusion of processed commodities

This information should be sent to Dr Hans JEURING, Inspectorate for Health Protection and Veterinary Public Health Ministry of Health, Welfare and Sport, PO Box 16108, 2500 BC Den Haag, Fax:+31 70 340 5435, E-mail: hans.jeuring@kvw.nl), with a copy to the Secretary, Codex Alimentarius Commission, FAO, Viale delle Terme di Caracalla, 00100 Rome, Italy (fax: +39 06 57054593; e-mail: codex@fao.org), **not later than 15 October 2002**.

6. REQUEST FOR PROPOSALS FOR ADDITIONS TO PRIORITY LISTS OF PESTICIDES SCHEDULED FOR EVALUATION OR REEVALUTION BY JMPR

Proposals are being requested from countries for pesticides to be added to the Codex Priority List of Pesticides, for subsequent recommendation to the Joint Meeting on Pesticide Residue (JMPR) for evaluation.

Those countries planning to submit proposals for consideration by the Codex Committee on Pesticide Residues at the next Session are invited to consult Appendices I and II of the CL 2002/1-PR, complete and send the completed Appendix II[2] to Dr Trevor DOUST, Manager – Chemistry and Residues Evaluation, National Registration Authority for Agricultural and Veterinary Chemicals, PO Box E 240, KINGSTON, ACT 2604, Fax: +61 2 6272 3551, Email: tdoust@nra.gov.au with a copy to the Secretary, Codex Alimentarius Commission, FAO, Viale delle Terme di Caracalla, 00100 Rome, Italy (fax: +39 06 57054593; e-mail: codex@fao.org), **not later than 1 December 2002**.

PART D: REQUEST FOR INFORMATION AND DATA TO BE SENT TO JOINT FAO/WHO MEETING ON PESTICIDE RESIDUES

RESIDUES AND TOXICOLOGICAL DATA REQUIRED BY JMPR FOR PESTICIDES SCHEDULED FOR EVALUATION OR PERIODIC RE-EVALUATION

Governments and interested international organizations are invited to send inventory of data for pesticides on the agenda of the JMPR. Inventories of information on use patterns or good agricultural practices, residue data, national MRLs, etc. should be sent to Dr Amelia Tejada, Plant Protection Service, AGP, FAO, Viale delle Terme di Caracalla, 00100 Rome, Italy, well before **30 November** of a year before a JMPR meeting where a pesticide of concern is scheduled to be evaluated and, submission of residue data should be well before the **end of February** of the same year as the JMPR meeting. Toxicological data should be sent to Dr J.L. Herrman, International Programme on Chemical Safety, WHO, CH-1211 Geneva 27, Switzerland not later than one year before the JMPR meeting **(see Appendix VII of ALINORM 03/24).**

Those countries specified under individual compounds in the ALINORM 03/24 concerning matters related to the FAO Panel of the JMPR (GAP, residue evaluation, etc.) on specific pesticide/commodity(ies) or concerning toxicological matters are invited to send information of data availability and/or toxicological data (for deadlines see the paragraph above).

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[2] In completing Appendix II, only a brief outline is needed. The form may be retyped if more space is needed under any one heading provided that the general format is maintained.
While consulting Appendix I, please note that pesticide/commodity combinations which are already included in the Codex system or under consideration are found in a working document prepared for and used as a basis of discussion at each Session of the Codex Committee on Pesticide Residues; the most recent being CX/PR 02/6. Consult the document to see whether or not a given pesticide has already been considered.

SUMMARY AND CONCLUSIONS

The Thirty-fourth Session of the Codex Committee on Pesticide Residues reached the following conclusions:

MATTERS FOR APPROVAL BY THE 25TH SESSION OF THE COMMISSION

The Committee recommended to the Commission:

- Draft and draft revised MRLs for adoption at Step 8 and Proposed Draft MRLs at Step 5/8 (Appendix II);
- Adoption of the Amendments to the Introductory Section of the Recommended Methods of Analysis for Pesticide Residues at Step 5/8 omiting Steps 6 and 7 (Appendix V);
- Revocation of certain existing Codex MRLs (Appendix IV); and
- Priority List of Pesticides for new pesticides and periodic evaluations by the JMPR (Appendix VII).
- To reinstall at their former status at Step 8 the MRLs for Malathion (049) for peach, raspberries (red and black), and root and tuber vegetables which, due to an error in Appendix VI to ALINORM 01/24A, para 101, were revoked by the 24th Session of the CAC (see para. 84).

FOR INFORMATION TO THE COMMISSION

The Committee:

- Generally agreed with the views and recommendations under the General Considerations of the 2001 JMPR (para. 23);
- Agreed to postpone more detailed consideration on probabilistic risk assessment and cumulative risk assessment pending an outcome of the FAO/WHO consultation on these issues when there was a better understanding of a linkages between a probabilistic approach and cumulative risk assessment (paras 40-45);
- Agreed to prepare a document outlining the risk analysis policies used in establishing Codex Maximum Residue Limits for Pesticides for the development of own specific guidelines for risk analysis for incorporation into the Procedural Manual (paras 46 - 47);
- Accepted, in principle, the elaboration of MRLs of spices based on monitoring data provided by the spice producing country, and agreed that criteria for the development and use of such data needed to be elaborated further (paras 201-210);
- Generally agreed that steps must be taken to reduce the timeframe for the consideration and adoption of MRLs for new compounds in order to reduce such trade vulnerabilities (paras 181-195);
- Confirmed that the JMPR was essential to the continued independent international evaluation of pesticide residues while noting, however that because of the increasing demands on the process and the additional complexity of evaluations, the process had become unsustainable and without additional resources the system would fail sooner, rather than later, therefore welcomed the initiative of FAO and WHO to review the process and the depth and breadth of the working procedure of the Joint FAO/WHO Meeting on Pesticide Residues (paras 196-200);
- Agreed to consider further to what extent the Codex Classification of Foods and Animal Feeds should be updated and what could be practical implications of the revision on the current status of Maximum Residue Limits at the next session of the Committee (paras 211-216) ;
- While considering establishment of MRLs for captan, requested the JMPR to review data for extrapolation of MRLs from peach to nectarines in 2002 (para. 52).
- Decided to refer the paper on probabilistic approach to JMPR for their information and requested JMPR to provide preliminary comments on the applicability of this a tiered probabilistic approach at the international level (para 40) ;
- Requested JMPR to develop guidance for the submission of monitoring data for MRL-setting (para 209).
- Removed from the tentative schedule of priorities oxytetracycline and gentamicin pending further consideration by FAO and WHO on the use of antibiotics in agriculture and their potential impact

on human health (para. 180).

MATTER OF INTEREST TO OTHER COMMITTEES

The Committee:

- Further following the request of the CCNFSDU, noted that the phrase "these limits" in the wording proposed by the CCNFSDU was not technically correct and did not fit into the context of provisions already endorsed, therefore agreed to replace this phrase by "these measures" and restated that its conclusions reached at the 32nd Session that the current system of establishing MRLs on raw commodities should be protective for all subgroups of the population including infants and young children[3]. The Committee also noted that the 2002 JMPR intended to consider increased vulnerability of infants and children, and agreed that any change that would result from this consideration would be taken into account, as appropriate (paras 8-9).

[3] ALINORM 01/24, paras 67-78.

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LIST OF ABBREVIATIONS
(Used in this Report)

CAC	Codex Alimentarius Commission
CCFAC	Codex Committee on Food Additives and Contaminants
CCGP	Codex Committee on General Principles
CCMAS	Codex Committee on Methods of Analysis and Sampling
CCNFSDU	Codex Committee on Nutrition and Foods for Special Dietary Uses
CCPR	Codex Committee on Pesticide Residues
CCRVDF	Codex Committee on Residues of Veterinary Drugs in Foods
CLI	CropLife International
CI	Consumers International
EC	European Community
FAO	Food and Agriculture Organization of the United Nations
JECFA	Joint FAO/WHO Expert Committee on Food Additives
JMPR	Joint FAO/WHO Meeting on Pesticide Residues
SPS Agreement	Agreement on the Application of Sanitary and Phytosanitary Measures
WHO	World Health Organization
WTO	World Trade Organization

acute RfD	acute Reference Dose
ADI	Acceptable Daily Intake
CXL	Codex Maximum Residue Limit for Pesticide
DIE	Daily Intake Estimate
GAP	Good Agricultural Practice in the Use of Pesticides
EMRL	Extraneous Maximum Residue Limit
IEDI	International Estimated Daily Intake
IESTI	International Estimated Short-Term Intake
MRL	Maximum Residue Limit
PHI	Pre-harvest Interval
PTDI	Provisional Tolerable Daily Intake
STMR	Supervised Trials Median Residue
TMDI	Theoretical Maximum Daily Intake

REPORT OF THE THIRTY FOURTH SESSION OF THE CODEX COMMITTEE ON PESTICIDE RESIDUES

The Hague, The Netherlands, 13-18 May 2002

INTRODUCTION

1. The Codex Committee on Pesticide Residues (CCPR) held its 34th Session in The Hague, The Netherlands, from 13 to 18 May 2002 at the kind invitation of the government of The Netherlands. Dr W.H. van Eck of the Netherlands Ministry of Health, Welfare and Sport chaired the Session. The Session was attended by 52 Member countries and 12 international organizations. The list of participants is attached as Appendix I to this Report.

OPENING OF THE SESSION

2. The Session was opened by Mr De Leeuw, Director-General of the Food and Non-Food Authority of the Ministry of Health, Welfare and Sport. He welcomed the delegates to The Hague and acknowledged the increased significance of food safety in the world, especially in the context of the treaties of the World Trade Organization. Mr De Leeuw emphasized that the globalization of trade in food and feed has become increasingly a political issue in many countries and pointed out the importance of science and transparency as a basis for establishing of Codex standards. He also drew the attention of the delegates to the length of time it takes to establish MRLs and consequences that this may have on the sustainability of Codex process. He also pointed out to the difficulties regarding the methodology of short-term intake. Finally Mr De Leeuw encouraged the delegates to reach agreement on controversial issues and wished a successful conclusion of the meeting.

ADOPTION OF THE AGENDA (AGENDA ITEM 1)

3. The Committee **agreed** to the proposal of the Delegation of the United States to consider issues related to Joint Meeting on Specifications under Item 12 : Other Business and Future Work. It also agreed to consider a report prepared for FAO and WHO by a Consultant on a review of the Working Procedures of the Joint FAO/WHO Meeting on Pesticide Residues (CX/PR 02/14) in conjunction with Item 9 : Trade Vulnerabilities Arising from the Codex MRLs Establishment Process. With these amendments the Provisional Agenda as contained in CX/PR 02/1 was adopted as the Agenda for the Session.

APPOINTMENT OF RAPPORTEURS (AGENDA ITEM 2)

4. Dr C.W. Cooper (USA) and Dr D. Lunn (New Zealand) were **appointed** as rapporteurs.

MATTERS REFERRED TO THE COMMITTEE (AGENDA ITEM 3)[4]

5. The Committee noted that a number of matters arising from the 48th and 49th Sessions of the Executive Committee, the 24th Session of the Codex Alimentarius Commission, the 16th Session of the Committee on General Principles (CCGP) and from FAO/WHO were for information purposes or would be discussed in more detail under the relevant Agenda Items. Additionally the Committee noted matters referred to the Committee as follows :

Recommendations of the FAO Conference on International Trade Beyond the Year 2000

6. The Committee noted that the recommendations most relevant to its work, namely Recommendation 14 concerning consideration of special needs for developing countries, and

[4] CX/PR 02/2, CRD 4 (comments of the European Community), CRD 6 (comments of India).

Recommendation 21 related to the effectiveness of consideration of written comments were already being addressed by the Committee.

Draft Medium-Term Plan (MTP)

7. The Committee noted that this matter would be considered in more detail at the next session of the Executive Committee[5] with the possibility for further comments and finalization by the next Session of the Commission and that the Objectives of the Medium-Term Plan sufficiently covered working areas and arrangements for the Committee. Therefore, there was no need for any action at the current session in this regard.

Pesticide Provisions in the Proposed Draft Standard for Cereal – Based Foods for Infants and Young Children

8. The CCPR noted that the 23rd Session of the Codex Committee on Nutrition and Foods for Special Dietary Uses (CCNFSDU)[6] had amended the wording of pesticide residue provisions endorsed at the 32nd session of the CCPR[7] by proposing additional wording "These limits shall take into account the specific nature of the products concerned and the specific population group for which they are intended in order to provide additional protection of infants and young children".

9. The Committee noted that the phrase "these limits" in the wording proposed by the CCNFSDU was not technically correct and did not fit into the context of provisions already endorsed, therefore agreed to replace this phrase by "these measures" i.e. :

> *"These measures shall take into account the specific nature of the products concerned and the specific population group for which they are intended"*

10. The Committee **restated** that its conclusions reached at the 32nd Session that the current system of establishing MRLs on raw commodities should be protective for all subgroups of the population including infants and young children[8]. The Committee also noted that the 2002 JMPR intended to consider increased vulnerability of infants and children, and **agreed** that any change that would result from this consideration would be taken into account, as appropriate.

REPORT ON GENERAL CONSIDERATIONS BY THE 2001 JOINT FAO/WHO MEETINGS ON PESTICIDE RESIDUES (AGENDA ITEM 4)[9]

11. The report notes that FAO and WHO have initiated a project to update and consolidate the principles of risk assessment for the toxicity, intake, residues, and specifications, as appropriate, for pesticides, veterinary drugs, food additives, and contaminants. This project, which has been undertaken in response to a recommendation of the 'Melbourne Conference', will be a comprehensive project that will provide an opportunity to update and harmonize approaches across all classes of chemicals in food. Governments and other interested parties will be given an opportunity to comment on documents as they are being prepared, and it will be particularly important that FAO and WHO receive feedback from CCPR as the risk managers in the process of developing international standards for pesticides. The project plan and call for experts are on the FAO and WHO web sites.

12. Acute toxicity has been a recurring issue that has been considered by JMPR in recent years. Section 2.1 highlights the points that require further development and includes a recommendation that WHO establish a working group to develop a paper for consideration by the 2002 JMPR that takes into account work in this area by governments. The working group had been established and was considering a number of issues that were identified in the report. It is also considering the pesticides that were returned to JMPR for further consideration of acute reference doses at the Thirty-third Session

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5 CX/EXEC 02/50/5.
6 ALINORM 03/26, para. 114.
7 ALINORM 01/24, para. 74.
8 ALINORM 01/24, paras 67-78.
9 Pesticide residues in food – 2001 (FAO Plant Production and Protection Paper 167, 2001); CRD 4 (Comments of the European Community); CRD 6 (Comments of India).

of CCPR at the request of the Netherlands. Thus, the acute reference dose will be an important topic for discussion by the 2002 JMPR.

13. In response to the questions raised regarding scientific and ethical limitations of human studies, the JMPR Secretary noted that this issue would be considered by the 2002 JMPR in relation to the issue of acute toxicity.

14. Section 2.2 described the possibilities of sharing the work of agricultural pesticide reviews. The report notes that a workshop on sharing the work of agricultural pesticide reviews was organized by OECD, the EU, and EPA in Brussels in 12-14 February 2001. The ultimate goal of work sharing is globalization of pesticide reviews. It is also aimed at reducing the workload of the reviewers and facilitating the submission of dossiers by industry and making it easier for national governments to accept the assessment underlying the recommendations of the JMPR. 'Work sharing', in this context, means dividing the work of reviewing a submission on a pesticide among two or more reviewers in different national or regional authorities or international organizations, each referring to the other's evaluation in making its review, while respecting the right of each country or organization to finalize its own risk assessment and to make its own regulatory decision. The JMPR considered that, before work sharing could be accepted on a routine basis in their work, the technical, scientific and policy conditions would have to be elaborated.

15. The JMPR welcomed the implementation of a formal pilot project on work sharing at the international level, in which differences and similarities between current procedures and approaches to toxicological and residue evaluations used by JMPR, OECD and national governments should be identified. The Meeting looked forward to publication of the final OECD Minimum Data Requirements for Establishing Maximum Residue Limits, to facilitate work sharing and will follow with interest the discussions on items that are still in abeyance, such as the climate zoning project and extrapolation of the behaviour of residues between crops.

16. The Committee noted that the matter of work-sharing would be taken up in the context of Agenda Items 9 and 12.

17. The Committee was informed that a meeting with OECD and national governments would be held on 13 June 2002 to discuss the initiation of the project and the identification of resources.

18. Section 2.3 discussed the numerical expression of residue limits that have generally been followed since 1988 ; however, experience has shown the need to insert other values on occasion, when 'rounding up'. The option to use other values as necessary should be maintained.

19. At its 33rd Session (ALINORM 01/24A, 2001, para 217), the CCPR requested JMPR to review its requirements for periodic re-evaluation when certain components of the re-evaluation have not changed (such as analytical methods or studies on metabolism). In section 2.4, the JMPR stated that it agreed that in some circumstances recent reviews of studies could be carried over to periodic reviews. However, reviews made many years previously are generally not particularly useful, because more information is now extracted, and the evaluations are more detailed.

20. Section 2.5 notes that the 1998 JMPR prepared a worked example for estimation of residues in milk and applied the highest transfer factor, obtained from the highest feeding level, representing about nine times the calculated maximum daily intake of dairy cows. In the evaluations made by the 1998, 1999 and 2000 Joint Meetings, the principle was applied on a case-by-case basis to consolidate the procedure for estimation of residues. Worked examples were included in the 2001 JMPR report and in the 'FAO Manual' (Plant Production and Protection Paper 170). When the recommended maximum residue levels resulting from direct treatment of the animal and from residues in animal feed do not agree, the higher recommendation will prevail.

21. When considering statistical methods for evaluating residue data in section 2.6, the JMPR reiterated its view that the evaluation of data from trials of pesticide residues is complex and includes consideration of factors such as metabolism and rate of disappearance. It cannot be based only on calculations, and, therefore, statistical methods can support an expert judgement but not replace it.

22. The JMPR Joint Secretariat announced that calls for experts with the appropriate scientific background for both the FAO Panel and the WHO Core Assessment Group have been placed on their respective web sites (www.fao.org/ and www.who.int/pcs). He noted that FAO and WHO are seeking to expand the pool of experts from which they choose participants for JMPR.

23. The Committee generally **agreed** with the views and recommendations under the General Considerations of the 2001 JMPR.

DIETARY EXPOSURE IN RELATION TO MRL SETTING: ACUTE DIETARY RISK ASSESSMENT (AGENDA ITEM 5 (A))[10]

24. The Representative of WHO informed the Committee that just prior to the meeting, South Africa had submitted information to WHO on the 97.5th percentile consumption (eaters only) for common foods in the South African diet for children (ages 5 and under) and for the general population (ages 10 and above). A preliminary review of the data indicated that several of the large portion sizes reported by South Africa exceeded the currently listed consumption values particularly those for maize meal and maize flour, which were about 25 times the current amounts.

25. No other additional data were received. However, the delegation of India reported that food consumption data would become available in the near future and would be submitted to WHO.

26. The WHO Representative noted that the last Session of the Committee had requested WHO GEMS/Food to calculate the chronic and short-term exposure estimates for disulfoton (074) in the light of the withdrawal of support for certain uses (See CX/PR 02/3 and Agenda Item 6, paras 108-110).

27. The Committee welcomed the submission of large portion consumption data from South Africa and the advise from India that their data would also be provided and again encouraged all countries in possession of such data to submit these to WHO (see CL 1998/28-PR and CL1999/30-PR Part 3A). The Committee agreed that, in cases where higher large portion consumption values are reported to WHO, GEMS/Food should recalculate the International Estimated Short Term Intake (IESTI) for relevant commodities for pesticides in the stepwise procedure.

28. The Committee was informed that the 2001 JMPR had performed relevant chronic dietary intake assessments for pesticide residues considered by the meeting. The JMPR also calculated International Estimated Short-Term Intakes (IESTIs) for pesticide residues for which acute RfDs were established. In addition the JMPR estimated the chronic dietary intakes of clethodim (187) and mevinphos (053) at the request of the Committee at its last session (ALINORM 01/24A, paras 174 and 53 respectively).

29. The results of these calculations were summarized in Section 3 of the 2001 JMPR report and detailed calculations are provided in Annex 3 to that report. In regard to chronic intakes, only the calculations for carbaryl (008), haloxyfop (194) and prochloraz (142) could not confirm that the long-term intake of residues would be below their respective ADIs. More refined estimates of carbaryl and prochloraz residue levels were likely to significantly reduce intake estimates as the current estimates are Theoretical Maximum Daily Intakes. However, the International Estimated Dietary Intake for haloxyfop already incorporated the use of STMRs.

30. In regard to acute intakes, calculations for residues of aldicarb (117) in banana and potato, chlorpropham (201) in potato and methomyl and tebufenozide (196) in several commodities could not confirmed that the short-term dietary intakes of residues in these commodities would be below their respective acute reference doses.

31. The Committee was also advised that the 2001 JMPR had continued to make refinements in the dietary intake calculations. In particular, the JMPR had decided to calculate intakes for fat-soluble pesticides in meat by using the residues measured in muscle tissue as compared to the previous practice of using residues in fat combined with the portion of fat in meat as consumed, i.e. 20% of meat. Some delegatons and the bserver of Consumers International raised concerns that the change in the

[10] CX/PR 02/3; CRD 4 (comments of the European Community); CRD 6 (comments of India); CRD 7 (comments of CropLife International).

assessment methodology may may underestimate exposure. Some members of the 2001 JMPR stated that the availability of better analytical methods allowed direct analyses of residues in muscle meat as consumed and that this was preferable to indirect calculations for estimating exposure. It was also stated that more data were needed to decide what was the tissue of preference to be used in intake calculations. The Committee encouraged countries to send their comments directly on this matter to the JMPR.

32. The Committee was informed by the Observer of CLI that the project on the derivation of variability factors of residues on single items on grapes and lettuce was finished and that the detailed report had ben sent to the 2002 JMPR.

THE PROBABILISTIC APPROACH TO ACUTE DIETARY EXPOSURE ANALYSIS AND ITS APPLICABILITY AT THE INTERNATIONAL LEVEL[11]

33. The Committee recalled that it had previously considered issues related to acute exposure assessment, especially refinement of acute risk assessment and the policy to be followed by CCPR when acute exposure assessment exceeded acute RfD. The Committee had requested the Delegation of the United States with assistance of other countries[12] to prepare a paper on the methodology of probabilistic exposure estimation, with the understanding that it would assist in ensuring that risk management decisions at the international level would be based on the best estimate of acute dietary exposure.

34. The Delegation of the United States informed the Committee that the probabilistic exposure assessment methodology was practiced in some countries and that it led to a more accurate assessment of exposure than the deterministic 'point estimate' approach currently used by JMPR. It indicated that this probabilistic methodology was more difficult and required good consumption data for different subgroups of the population. The Delegation also noted that there should be an international consensus on the assumptions underlying the probabilistic approach before implementing it for MRL-setting at international level. It also indicated that a tiered approach for acute risk assessment could be used starting with an IESTI and using more refined estimates based on Monte Carlo simulations using available data sets.

35. Several delegations and the Observer of CI, while emphasizing the usefulness of the probabilistic approach which provided a more realistic acute risk assessment, especially for certain population groups, noted that this methodology was only used by a limited number of very industrialized countries and that it required sophisticated consumption and pesticide monitoring data which were not always available or possible to generate with the necessary credibility at the international level. It was indicated that it might take some time before this methodology could be adopted. Some delegations pointed out that the application of the probabilistic approach was quite resource demanding. Therefore, in view of current limitations in this area very careful consideration should be given to this matter with a view to the adoption of probabilistic modelling in the near future.

36. The Observer of CropLife International, referring to its written comments in CRD 8, favoured further development of this methodology. However, before proceeding with this methodology at international level some procedural decisions should be taken and that the current deterministic methodology could be improved. The Observer was of the view that tiered approach could be used and that a working group might be useful in harmonizing issues on the data collection and to further guide the use of probabilistic methodology at the international level.

37. The Joint WHO Secretary of JMPR informed the Committee that there would be a FAO/WHO Consultation on intake assessment including considerations related to probabilistic modelling and improving deterministic approaches that are currently used as part of its project to up-date the principles and methods for the safety assessment of chemicals in food (see also paras 40 and 45). The Joint Secretary indicated that this consultation could be held within the next year, resources permitting.

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[11] CX/PR 02/3-Add.1; CX/PR 02/3-Add.1: Annex 1 ; CRD 8 (Comments of CropLife International).

[12] The Netherlands, Australia, Consumers International, Crop Life International).

38. The Observer of the IUPAC informed the Committee that an IUPAC project on acute dietary assessment was close to completion and that it would summarize the current state of art for assessment methods and would include proposals for improving the currently employed deterministic approach. The Observer indicated that the final report will be available in advance of the 35th Session of the Committee and that it might be used by the CCPR for discussions.

39. The Committee complimented the authors for the valuable document and concluded that to convene a Working Group was too premature at this stage. The Committee **agreed** to postpone more detailed consideration on this issue pending an outcome of the FAO/WHO consultation. The Committee **decided** to refer this matter to JMPR for their information and requested JMPR to provide preliminary comments on the applicability of this a tiered probabilistic approach at the international level. The Committee **agreed** that there was a need to improve the current methodology used for point estimates and requested the Delegation of the Netherlands with assistance of Australia, the United States and IUPAC to prepare a paper containing proposals on the improvement of the current methodology and to propose the risk management options for MRLs with acute short-term intake concerns, for consideration by the next session of the Committee.

DISCUSSION PAPER ON THE METHODOLOGY OF CUMULATIVE RISK ASSESSMENT (AGENDAS ITEM 5 (B))[13]

40. The Committee recalled that the development of cumulative risk assessment for acute hazards required further consideration, especially regarding common understanding of the methodology. Therefore it requested the Delegation of the United States to prepare a paper on this matter for consideration by the Committee[14].

41. The Delegation of the United States introduced the paper and informed the Committee that historically the safety of pesticides had been evaluated on the basis of single-chemical and single exposure pathway scenarios. However there were situations when individuals could be exposed to multiple pesticides by several pathways. In such cases a ten step procedure using computer techniques and probabilistic modelling had been developed to consider and evaluate cumulative risk for a group of pesticides that shared a common mechanism of toxicity. The Delegation indicated that this document was primarily for information purposes as the methodology was at early stage of development and that more detailed results would be available later in the year.

42. The Observer of Consumers International was of the view that a cumulative risk assessment was needed as consumers were exposed to multiple residues of chemicals with common mechanism of action and to multiple chemicals from multiple pathways of exposure. The Observer noted that 1997 Joint FAO/WHO Expert Consultation on Food Consumption and Exposure Assessment stated that exposure assessment should consider this. Therefore the Observer supported the necessary actions to take this approach forward.

43. The Observer of CropLife International, referring to CRD 9, questioned the usefulness of the application of cumulative risk assessment at the international level and indicated it was very complex and required very sophisticated data on consumption, residues/exposure from different sources and that there was great uncertainty about how to resolve a situation where cumulative risk calculation determined an unacceptable risk. The Observer was of the view that before applying this methodology at international level there should agreement on the quality and quantity of data collection. The Observer noted that the application of this methodology would be more difficult at international level than at national level.

44. Some delegations indicated that this methodology required very good toxicological information and that more detailed scientific evaluation would need to be made by JMPR. Other delegations pointed out that this matter could be considered by the FAO/WHO Consultation (see para 37). The Delegation

[13] CX/PR 02/4; CRD 4 (comments of the European Community); CRD 6 (comments of India); CRD 9 (comments of CropLife International).
[14] ALINORM 01/24A, para 78.

of Germany pointed out that this methodology might very useful in the future when evaluating cumulative risks for certain pesticides and that there was the need for this methodology in order to reply to questions raised by consumers.

45. The Committee noted that cumulative risk assessment had the potential to be an important tool and should be further explored. However, it was difficult to proceed at the international level because there was no advancement yet on the probabilistic approach which was an important element of this methodology for the assessment of acute hazards. The Committee **agreed** to return to this matter when the results of FAO/WHO Consultation became available and when there was a better understanding of a linkages between a probabilistic approach and cumulative risk assessment. It decided to refer this issue to the JMPR for information only.

THE APPLICATION OF RISK ANALYSIS IN THE ELABORATION OF CODEX STANDARDS (AGENDA ITEM 5©)[15]

46. The Committee recalled that this matter had been included on the Agenda at the request of the 16th Session of the Committee on General Principles (ALINORM 01/33A, para. 83). The Committee was informed that the matter had been further discussed by the Committee on General Principles at its 17th Session (April 2002) together with the main document of Proposed Draft Working Principles for Risk Analysis at the suggestion of the Delegation of India. Several of the proposals contained in the document had been incorporated into the main Working Principles (ALINORM 03/33, paras. 15 – 66). In this light, it was agreed that it would not be appropriate for the Committee to re-open or re-discuss this matter.

47. The Committee noted, however, that the *Action Plan for Risk Analysis in the Codex System* adopted by the Commission in 1997 foresaw that once the Codex-wide Working Principles had been adopted, relevant Codex Committees would be requested to develop their own specific guidelines for risk analysis for incorporation into the Procedural Manual. It was also noted that some Codex Committees had begun work in this regard. The Committee therefore welcomed the offer of the Codex Secretariat to recruit a Consultant to prepare a document outlining the risk analysis policies used in establishing Codex Maximum Residue Limits for Pesticides. It **agreed** that this matter should be discussed at the Committee's next session.

DRAFT AND PROPOSED DRAFT MAXIMUM RESIDUE LIMITS IN FOODS AND FEEDS AT STEPS 7 AND 4 (AGENDA ITEM 6)[16]

General comments

48. The Delegation of the United States indicated its preference for retaining draft MRLs for organophophorous compounds at Step 6 until the results of their cumulative risk assessment were available. This was expected to become available in mid 2002. The completion of this risk assessment or the results thereof, were not pre-requizite for the advancement of Codex MRLs. However, given the timing of relevant Codex meetings, and the expected completion date for the US assessment, the Committee **decided** to await its outcome before making the final decisions concerning the advancement of relevant MRLs.

49. The Observer of Consumers International indicated that it could not support the advancement of MRLs for organophophorous compounds and other pesticides known to act on the nervous system if the database did not include a developmental neurotoxicity study, since this was necessary information for assessing risks to infants and children and since CCPR procedures did not adequately account for the risk from multiple exposure to pesticide residues having a common mechanism of action.

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15 CX/PR 02/5 (This document reproduces document CX/GP 01/4).

16 CL 2001/14-PR; CL 2002/4-PR; CX/PR 02/6;CX/PR 02/6-Add. 1 (Comments of); CRD 6 (Comments of India).

50. The delegation of Sudan expressed concern at the lack of global perspective in the elaboration of MRLs. The Chair acknowledged that in setting MRLs it was important to take into account the needs and circumstances in all regions in the world, but that often data were only available from a few regions.

CAPTAN (007)

51. The Delegation of Australia expressed its concern regarding the differences between the MRLs for peach and nectarines and asked if JMPR would consider extrapolation from peach to nectarins.

52. The Committee **requested** the JMPR to review data for extrapolation of MRLs from peach to nectarines in 2002.

53. The Delegation of France expressed its reservation on the MRL for grapes and the Committee was informed of the high levels of residue on the leaves which could result in skin sensitization problems for the persons harvesting the grapes. The Delegation of France further informed the Committee that the 0-day PHI was not unacceptable for winegrapes because of possible inhibition of fermentation. The Observer from EC expressed its reservation concerning the establishment of MRLs based on a 0-day PHI especially in light of the high MRLs proposed since captan was a skin sensitizer and that the latter aspect could also be a concern for consumers. The Observer from the EC stated that no MRLs should be advanced beyond Step 6 until acute intake concerns have been addressed. The Observer from the EC questioned the JMPR recommendation that an acute reference dose was not needed.

54. The Delegation of Chile expressed its concern at three levels : there were trade problems regarding the access to the markets of Europe and the USA because the EU would not accept as a high level as the USA allows ; there were fermentation problems with wine ; the MRLs did not reflect GAP.

55. The delegation of the USA supported advancement of all proposed MRLs.

56. The WHO Joint Secretary stated that there were no toxicological alerts to indicate the need for establishing an acute reference dose based on the guidelines outlined in the 2000 JMPR report. The Chairman invited the EC to conduct a risk assessment on acute intake.

57. The Observer from EC expressed reservations regarding the dietary exposure of infants and young children. The Observer from Consumers International questioned whether JMPR evaluated skin sensitization and the WHO Joint Secretary stated that although this had not been addressed directly, feeding studies should detect sensitization in the oral tract. The Chairman clarified that occupational exposure was not within the remit of Codex.

58. The Delegation noted that as a proposed MRL for pomefruit was moving through, the proposed MRLs for apple and pear could be deleted.

59. The Committee **decided** to recommend deletion of the MRL proposal for apple, apple pomace (dry) and pears while retaining the CXLs for apples and pears until the pomefruit proposal reaches Step 8. The Committee **decided** to return the MRLs to Step 6 for cherries, dried grapes (=currants, raisins and sultanas), grapes, nectarine, plums (including prunes), strawberry and tomato.

60. The Committee **decided** to advance the MRLs for cucumber, melons (except atermelon), peach, pome fruits (post-harvest), raspberries (red and black) to Step 5, and the Committee **decided** to advance the MRL for almonds and potato to Step 5/8 with omission of Steps 6 and 7.

CHLORMEQUAT (015)

61. The Observer of the EC expressed reservation to the proposed MRLs for wheat, triticale, rye, oat straw and fodder, (dry) of cereal grains, oat and rye forage (green) because lower proposed MRLs were sufficient. The Observer of the EC had reservations to the MRL for oats and pear because of acute intake concerns. The Observer noted that the pear MRL was based on Dutch and French data and all EC use had been withdrawn.

62. The Committee **decided** to consider withdrawal of the CXL for pear next year if there is no current GAP.

63. The Observer of the EC informed the Committee that one study was not sufficient for processed products from rye (bran, flour and wholemeal, and that for wheat (bran, flour, wholemeal) the MRLs were not acceptable because those MRLs are based on two studies that differ widely.

64. The Committee **decided** to advance the MRLs for barley, cotton seed, oat forage (green), rape seed, rape seed oil (crude), rye forage (green), rye wholemeal to Step 8, and to advance the MRLs for rye flour, straw and fodder (dry) of cereal grains, triticale to Step 5.

65. The Committee **decided** to return the MRLs for rye, rye bran (unprocessed), wheat, wheat bran (unprocessed), wheat flour, wheat wholemeal to the current Step.

66. The Committee **decided** to advance the MRLs for eggs ; goat meat ; kidney of cattle, goats, pigs and sheep ; liver of cattle, goats, pigs and sheep ; maize fodder ; maize forage ; meat of cattle, pigs and sheep ; milk of cattle, goats and sheep ; poultry, edible offal ; poultry meat to Step 5/8 with omission of Steps 6 and 7.

67. The Committee **decided** to recommend withdrawal of proposed MRLs for barley straw and fodder (dry), pear, rye straw and fodder (dry), oat straw and fodder (dry), and wheat straw and fodder (dry).

CHLORPYRIFOS (017)

68. The Observer from the EC expressed its reservations on animal product MRLs because of the necessity of coordination between JMPR and JECFA taking into account possible veterinary uses. The Committee took note of the conclusion of the 2002 JMPR that dermal applications were no longer considered a veterinary use. The delegation of France expressed its reservations for peppers with regard to GAP.

69. The Committee **decided** not to advance proposed MRLs beyond Step 6 pending completion of the US cumulative risk assessment process for organophosphate pesticides. The Committee was informed by the Observer from Crop Life International (CLI) that all information would be made available for 2004 on which the CXLs of cotton seed, cotton seed oil and rice will be supported. The Committee therefore decided to retain the CXLs for these commodities under the uder the four year periodic review procedure. The Committee decided to recommend the withdrawal of CXLs as recommended by the 2000 JMPR for celery ; egg plant ; kale ; kiwifruit ; lettuce, head ; mushrooms ; potato ; raspberries red, black. The delegation of Canada noted that the uses on tomatoes had been withdrawn.

70. The Committee **decided** to advance the proposed MRLs to Step 5 for alfafa fodders ; alfalfa forage (green) ; almonds ; banana ; broccoli ; cabbage, head ; carrot ; cattle kidney ; cattle liver ; cattle meat ; cauliflower ; coffee beans ; common bean (pods and/or immature seeds) ; dried grapes (= currants, raisins and sultanas) ; eggs ; grapes ; maize ; main fodder ; maize forage ; maize oil, edible ; milk of cattle, goats and sheeps ; onion bulb, pea vins (green) ; peach ; peas (pods and succulant = immature seeds) ; pecan ; peppers, sweet ; pig meat ; pig, edible offal of ; plums (including prunes) ; pome fruits ; poultry meat ; poultry edible offal of ; sheep meat ; sheep edible offal of ; sorghum ; sorghum straw and fodder, dry ; strawberry ; sugar beet, sugar beet leaves or tops ; sweet corn (corn-on-the-cob) ; walnuts ; wheat ; wheat flour ; and wheat straw and fodder, dry.

2,4 D (020)

71. The Observer of the EC expressed itsreservations on MRLs for animal products except poultry, as they could not accept a 0-day PHI as a abasis for deriving dietary burden of livestock animals.

72. The Committee **decided** to postpone discussions of the draft MRLs for citrus fruits, grapefruit and oranges, sweet, sour and to retain the CXL for citrus fruits pending the 2001 JMPR evaluations. The Committee also decided to advance the other draft MRLs from Step 6 to Step 8 for berries and other

small fruit ; edible offal (mammalian) ; hay or fodder (dry) of grasses ; meat (from mammals other than marine mammals) ; mills ; pome fruits ; poultry meat ; poultry, edible offal of ; sorghum ; soya bean (dry) ; soya bean fodder ; soya bean forage (green). The Committee also **decided** that the CXLs for blackberries ; meat (from mammals other than marine mammals) ; milks ; raspberries, red, black ; sorghum ; and vaccinium berries, including earberry should be withdrawn.

DIAZINON (022)

73. The Delegation of the United States of America and the Observer of the European Community expressed their concern on the acute intake. The Committee **decided** to return the draft MRLs to their current Step and to consider them next year when the cumulative risk assessment carried out by the USA is finalized.

DIMETHOATE (027)

74. The Committee **decided** to advance only the draft MRLs which were proposed at the LOD to Step 8 asparagus ; cabbage, savoy ; cattle, edible offal of ; eggs ; mammalian fats (except milk fats) ; meat of cattle, goats, horses, pigs and sheep ; milk of cattle goats and sheep ; onion bulb ; poultry fats ; poultry meat ; poultry, edible offal of ; sheep, edible offal of ; and sorghum and to return the other draft MRLs to the current Step. The Committee noted that the 2002 JMPR would consider the establishment of acute RfD, pending the residue evaluation of the 2003 JMPR. The Committee recommended to **revoke** the CXL for onion, bulb. The Committee **requested** the Observer of the EC to submit information on the present registrations in the EC, as the EC will establish most of their MRLs at the LOD, because of acute intake concerns.

75. The Committee **decided** to retain the CXLs for beetroot ; celery ; citrus fruits ; olive oil, refined ; olives ; olives, processed and peppers pending the residue evaluation by the 2003 JMPR.

76. The Delegation of Australia **informed** the Committee they would supply data to support the retention of the CXL for peppers.

77. The Committee was informed that plant metabolism studies on potatoes will become available for the 2003 JMPR and the Delegation of Brazil will submit residue trials in Citrus fruits.

FENITROTHION (037)

78. The Committee **decided** to retain the CXLs for rice, bran, unprocessed ; rice polished ; wheat bran, processed ; wheat bran, unprocessed ; wheat flour ; wheat wholemeal ; white bread ; meat (from mammals other than marine mammals) and milks for 4 years under Periodic Review Procedure and **decided** to retain the CXL for cereal grains for 1 year pending further information from the delegation of Australia and the manufacturer.

79. The Committee **decided** that all other CXLs should be revoked.

FENTHION (039)

80. The Committee **noted** that the current CXLs are mainly based on EU uses, and that fenthion presently is under evaluation in the EU. The Committee **decided** to retain the draft MRLs at Step 7B(a) of mandarins ; olive oil, virgin and oranges, sweet, sour to Step 7B(a) awaiting the finalisation of the evaluation in the EU.

81. The Committee **decided** that the CXLs for meat and milks as recommended by the 1995 and the 2000 JMPR should be revoked.

FOLPET (041)

82. The Committee **noted** the written comments from the EC regarding their reservations against advancement of MRLs of several commodities because of the absence of an the acute intake assessment. The delegation of the USA noted that insufficient data existed for evaluation of cucumber, melons and

tomato. The Committee was informed that this year's JMPR will evaluate the acute toxicity of folpet. The Observer of the EC was requested to submit a preliminary risk assessment and the observations made by France on the presence of large quantities of metabolites in wine to the JMPR.

83. The Committee **decided** to retain all draft MRL at current Step awaiting the 2002 JMPR evaluation and to consider these draft MRLs at its next Session.

MALATHION (049)

84. The Committee **noted**, that due to an error in Appendix VI to ALINORM 01/24A, para 101, the 24th Session of the CAC revoked the MRLs for peach, raspberries (red and black), and root and tuber vegetables. The Committee proposed to reinstall these MRLs at their former status and submitted them to the Commission for consideration at Step 8.

85. The Committee **noted** the written comments from the EC and the USA regarding the lack of animal feeding studies, the absence of an acute reference dlose and the need to retain an MRL for post-harvest uses on cereal grain.

86. The Committee discussed the feasibility of establishing MRLs for processed commodities such as tomato juice and **decided** to return the draft MRL for tomato juice to Step 6. The Committee **decided** to reconsider the need and criteria for setting MRLs on processed commodities in the context of the revision of the Codex Classification on Food and Animal Feed at its next Session.

87. Because of acute intake concerns and the absence of animal feeding studies, in principle draft MRLs would not be advanced beyond Step 6 and the current CXLs would be retained. However, for several commodities (beans, dry ; peppers ; spinach ; tomato ; turnip, garden ; wheat flour) the draft MRL was lower than the current CXL, resulting in a risk reduction. Therefore the Committee **agreed** to recommend revocation of the CXLs for these commodities, except for wheat flour, and to advance the draft MRLs to Step 8. The draft MRL for wheat flour, which was lower than the CXL was advanced to Step 5. The Committee **decided** to return all other draft MRLs to Step 6 noting that the 2003 JMPR would consider the establishment of acute RfD, and to retain the CXLs of cereal grainsawaiting the residue review by JMPR 2004.

88. The Representative of Crop Life International informed the Committee that the CXL of pears will be supported only with data on apple. The Delegation of Japan noted that if there were no data on pear but only on apple, a pome fruit MRL could not be estimated. The Committee **decided** that the CXL for pears should be revoked, because extrapolation from apple only was not agreed.

MEVINPHOS (53)

89. The Delegation of Australia indicated that it has data available for Brussels sprouts, broccoli and cabbages, head and would submit data to JMPR. However in view of four year rule, the Committee **decided** to delete the CXLs for broccoli ; Brussels sprouts ; cauliflower ; citrus fruits, cucumber ; grapes ; melons, except watermelon ; peas (pods and succulent= immature seeds) ; spinach ; strawberry and tomato. The Committee **decided** to retain the CXL for Cabbages head. The Committee also **decided** that for common bean (pods and/or immature seeds) and leek the CXL will be considered for deletion next year.

MONOCROTOPHOS (54)

90. The Committee noted that the compound was no longer supported. The Committee **decided** to consider revocation of the CXLs at its next session.

OMETHOATE (55)

91. The Committee noted that the compound was no longer supported. However, omethoate residues can result from uses of dimethoate. The Committee decided to delete of the proposed MRLs for apricot ; artichoke globe ; banana ; beans ; broccoli ; cucumber ; currant, black ; hops, dry ; kale ;

peach ; spinach ; strawberry and witloof chicory (sprouts), since these MRLs result from the use of omethoate only. For all other commodities the Committee **decided** to return the MRLs to the Steps 3 or 6.

2-PHENYLPHENOL (56)

92. The Committee was informed that the entry for draft MRLs for citrus fruits at Step 6(a) could be deleted. The Delegation of The Netherlands, supported by the Observer from Consumers International expressed reservations about advancement of MRLs without consideration of the need for an acute reference dose.

93. The Committee **decided** to advance the proposed draft MRLs from Step 6 to Step 8 for citrus pulp, dry and for orange juice. The Committee also **decided** to retain the CXLs for citrus fruits and pear.

PARATHION (58)

94. The Observer from the EC and the USA informed the Committee that this compounds would no longer be supported. The Committee **agreed** that all CXLs/MRLs should be withdrawn.

PARATHION-METHYL (59)

95. The Delegation of the USA informed the Committee that all uses were withdrawn or being withdrawn. The Observer from the EC informed the Committee that an evaluation of this compound was pending in the EC. The Committee **decided** to delete the CXLs for artichoke globe ; broccoli ; carrot ; celery ; cherries ; common bean (pods and or immature seeds) ; garden pea (young pods) ; gooseberry ; hops, dry ; lettuce, head ; lettuce, leaf ; lima bean (young pods and or immature sees) ; mustard greens ; raspberries ; rice husked ; spinach ; turnip greens ; turnip, garden. The Committee **decided** to retain the CXL for plums (including prunes), since Australia will submit new trial data (in 2 years time). The Committee **decided** to request JMPR to consider an MRL for nectarine based on extrapolation from peach at the request of the Delegation of Australia. The Committee **decided** to advance all proposed darft MRLs from Step 3 to Step 5 and to return all draft MRLs to Step 6, because the lack of animal feeding studies.

96. The Committee **decided** that these MRLs will not be advanced beyond Step 7 awaiting data on animal feeding studies. The Committee agreed to withdraw the proposed MRLs for clover ; rice ; and rice straw and fodder (dry).

PHOSALONE (60)

97. The Committee **decided** to return the MRL for Pome fruits and for stone fruits to Step 6, awaiting the outcome of the 2002 JMPR evaluation.

PHOSPHAMIDON (61)

98. The Committee **agreed** to consider deletion of the existing CXLs at its next years session as this compound was no longer supported.

PYRETHRINS (063)

99. The Chairman informed the Committee that the MRL for pulses related to post harvest use and the suffix Po should be added to it. The Committee **decided** to retain the MRLs for cereal grains and tree nuts under the periodic review procedure since it was informed by the delegations of Germany and Australia that data will be made available on these products respectively. The Committee **recommended** the revocation of the MRLs for dried fisch, dried vegetables and oilseed following the 2000 JMPR recommendation. The Committee **decided** to advance the MRLs for dried fruits and pulses to Step 5 and the MRLs for citrus fruits ; fruiting vegetables, cucurbits ; pea hay or pea fodder (dry) ;

pea vines (green) ; peanut ; peppers ; root and tubes vegetables and tomatoes to Step 5/8, omitting Steps 6 and 7.

QUINTOZENE (064)

100. The Committee **decided** to advance all MRLs in Step 6 which were based on US uses to Step 8 and to delete all the existing CXLs while noting that all uses are being withdrawn in the EC.

THIABENDAZOLE (065)

101. The Committee was informed by the WHO Joint Secretary of JMPR that an acute RfD of 0.1 mg/kg b.w was established at the 58th meeting of JECFA in 2002. The Committee invited the JMPR to finalise the acute intake estimate. The delegation of Germany expressed a desire for JMPR to establisch MRLs for citrus juices. Delegations were requested to advise JMPR of the availability of data to support the establishment of such MRLs.

102. The Committee **returned** the proposed MRL for melons, except watermelon proposed to Step 3, and **returned** the MRL for strawberry to 3, deleting the CXL, noting that the compound is used for these commodities in the USA and that the manufacturer will supply data for both commodities. In order to reduce the difficulties facing by developing countries, the delegation of France supported by the delegation of Jamaica proposed to advance the MRLs for avocado, mango and papaya to Step 8, but this was not accepted as residues remained in the edible portion. The Committee **decided** to advance all the proposed MRLs at Step 3 to Step 5 except melons, except watermelo and strawberry.

103. The Committee also decided that the proposed MRLs for cattle, edible offal of as recommended by the 2000 JMPR should be withdrawn.

CARBENDAZIM (072)

104. The Committee **agreed** to a proposal from the EC Observer to change the current residue definition to “sum of benomyl, carbendazim and thiophanate-methyl, expressed as carbendazim”. The Committee **recommended** the withdrawl of the proposed MRL for oats and cereal grains, following the recommendation from JMPR and to amend the proposed MRL for rye from 0.1 to 0.05 (*), extrapolating the MRL from wheat to rye. The Committee also noted that supporting data will be provided by Australia, Thailand (asparagus, mango, peppers) and that Brazil has recently finalized their evaluation. Brazil was also invited to submit the elevant information to JMPR.

105. The Observer of the EC will make data available on raspberries and blackberries and the manufacturer will make data on coffee and soya beans for consideration by the 2003 JMPR.

106. Following these comments the Committee **recommended** deletion of the CXLs for avocado, celery, onion bulb and sweet potato since they were no longer supported, to retain the current CXL for soya bean fodder for 1 year, pending information in writing from the manufacturer if supporting data will be made available. The Committee agreed to retain the current CXLs for asparagus, coffee beans, common beans (pods and or immature seeds), mango, soya bean (dry), and tree nuts since for these commodities data will be provided, to return the MRLs for berries and other small fruit (excluding grapes) ; lettuce, head and peppers to Step 6 and to advance all other proposed MRLs to Step 8 with deletion of the corresponding CXLs.

DISULFOTON (074)

107. The Committee noted an acute intake calculations of WHO as contained in CX/PR 02/3 and **decided** to retain the draft MRLs for broccoli ; cabbages head ; cauliflower ; lettuce head and lettuce leaf for acute intake concerns. The results of the cumulative risk assessment being carried out in the USA.

108. The Committee noted that the deletion of the MRLs for potato and Japanese radish could be considered next year as the manufacturer had stated that these uses were no longer supported.

109. The Committee would consider the advancement all remaining to Step 6 MRLs to Step 8 at its next Session.

PROPOXUR (75)

110. The Committee **recommended** deletion of all existing CXLs as they were no longer supported.

THIOPHANATE-METHYL (077)

111. The Committee **recommended** the deletion of all CXLs as the corresponding proposed MRLs for carbendazim (072) had reached Step 8.

AMITROLE (079)

112. The delegation of France informed the Committee that a new method of analysis is now available and agreed to submit it to JMPR, also informed that the EC has completed a full review of the toxicity and that there were no acute or chronic intake concerns. The Committee **decided** to advance all MRLs to Step 8 and invited submission of toxicology and residue data to JMPR.

DICHLOFLUANID (082)

113. The Committee noted that the CXLs for barley, cherries, common bean (pods and/or immature seeds), oats, rye, wheat and wheat straw and fodder were no longer supported and therefore **recommended** to delete these CXLs. The Committee also noted that in many countries the registration of this compound has expired and that tolylfluanid is scheduled for evaluation by the 2002 JMPR. The Committee therefore **agreed** to consider the other remaining CXLs at next years Session.

DICLORAN (083)

114. The Committee **decided** to advance the MRL for carrot to Step 8 and to delete the current CXL.

DODINE (084)

115. The Committee **requested** the Delegation of The Netherlands to submit their data for establishment of acute RfD to the 2002 JMPR.

FENAMIPHOS (085)

116. The Committee **decided** to return all draft MRLs to Step 6 and 6(a) noting intake concern , the very low acute reference dose and pending review of an acuteRfD by the 2002 JMPR.

DINOCAP (087)

117. The Committee noted that for this compound there were two acute refenrence doses established by the JMPR. The WHO Joint Secretary of JMPR clarified that one acute reference dose related to women of childbearing age was used to calculate the intake for adults, and that the other acute reference related to general population was used to calculate the intake for infants and young children. The Committee **decided** to return the MRL for grapes to Step 6, pending the availability of 2001 JMPR evaluation and advance all other MRLs to Step 8 noting the concerns of the Observer of the EC on the use of two acute reference doses.

METHOMYL (094)

118. The Committee noted that JMPR had identified acute intake concerns for several commodoties. The Committee noted that for the CXLs for egg plant ; hops, dry ; mint hay ; onion, welsh ; peanut ; peanut forage (green) ; peas shelled ; peppers ; pineapple ; sorghum ; soya bean (immature seeds) ; and

sugar beet the JMPR recommended withdrawal since these MRLs were no longer supported. The Committee therefore **decided** to consider the deletion of these MRLs at its next Session.

CARBOFURAN (096)

119. The Committee **decided** to return the draft MRLs to Step 6 pending the toxicological review by the 2002 JMPR establishing an acute reference dose.

METHAMIDOPHOS (100)

120. The Committee **decided** to return the draft MRLs for peach ; pome fruits ; and tomato Step 6 pending the periodic toxicology review by the 2002 JMPR and the periodic review of residues by the 2003 JMPR.

PHOSMET (103)

121. The Committee **decided** to return the draft MRL for apricot to Step 6 pending review by the 2002 JMPR and taking into account the concern of Germany regarding acute intake. The Committee invited the USA to submit written comments concerning combining apricot and nectarine residue data to support the CXL for nectarine and to demonstrate that an MRL of 5 mg/kg was sufficient.

DITHIOCARBAMATES (105)

122. The Committee **invited** the delegation of Morocco to submit their data to the 2004 JMPR about the Carbon disulphide formation by brassica vegetables which affects the analytical results.

ETHEFON (106)

123. The Committee **decided** to retain the draft MRL at Step 6 for dried grapes (=grapes, raisins and sultanas) pending the review by the 2002 JMPR of an acute reference dose.

IMAZALIL (110)

124. The Committee **requested** the Delegation of the Netherlands to submit their written comments on the establishment of the acute reference dose by the 2002 JMPR.

ALDICARB (117)

125. The Committee noted the exceedence of the acute reference dose for banana and potato assessed by the 2001 JMPR. The draft MRLs for banana will be considered in the next Session.

126. The FAO Joint Secretariat informed the Committee that the company submitted new information on the application method on bananas. This information will be considered at the 20002 JMPR.

MECARBAM(124)

127. The Committee **decided** to recommend deletion revocation of all CXLs as there is no longer any support for this compound.

METHIOCARB (132)

128. The Committee **decided** to advance the draft MRL of strawberry to Step 8.

BENDIOCARB (137)

129. The Committee would consider revocation of all CXLs at the next Session as the compound was no longer supported.

BITERTANOL (144)

130. The Committee **decided** to retain the CXL of apricot for a 4 year period as extrapolation from peach was possible and information on GAP in France will be submitted to the JMPR. Other Countries were also invited to submit GAP information on apricot. The Committee **decided** to advance the Draft MRL for tomato to Step 8.

CARBOSULFAN (145)

131. The Committee noted the written comments from the EC expressing a reservation regarding the lack of an acute reference dose.

132. The Committee **decided** to return all draft MRLs in Step 6 to step 6 awaiting the acute risk assessment by the 2003 JMPR.

CYHALOTHRIN (146)

133. The observer of the EC asked the Committee when the CXLs will be considered for revocation as the compound is no longer supported. The *ad hoc* Working Group on Priorities was requested to clarify the situation.

METHOPRENE (147)

134. The Committee would consider revocation of the CXLs of eggs ; maize oil, edible ; mushrooms and peanut at its next Session as these commodities are no longer supported by the manufacturer. The Delegation of Australia will confer with the manufacturer and inform the Committee at its next Session on the support of the CXLs of cereal grains ; wheat, bran, unprocessed ; wheat flour and wheat wholemeal; cattle milk ; edible offal (mammalian), and meat (from animals other than marine mammals).

DIMETHIPIN (151)

135. The Committee would consider revocation of the CXLs of linseed ; sunflower seed oil, crude and sunflower seed oil, edible at its next Session as recommended by the 2001 JMPR if not supported.

PACLOBUTAZOL (161)

136. The Committee would consider revocation of all CXLs at the next Session if the compound was no longer supported.

ANILAZINE (163)

137. The Committee **decided** to recommend revocation of all CXLs as the compound was no longer supported.

FLUSILAZOLE (165)

138. The Committee **decided** to retain all CXLs as the compound is supported by the manufacturer.

OXYDEMETON-METHYL (166)

139. The Committee noted the written comments from the EC expressing a reservation regarding the lack of an acute reference dose. The 2002 JMPR will establish an acute reference dose and that the EU would reduce their MRLs for most uses in 2002 because of acute and chronic intake problems. The Committee **decided** to return all draft MRLs at Step 6 to Step 6 pending the evaluation by the JMPR 2002.

TERBUFOS (167)

140. The Committee **decided** to recommend revocation of the CXL of barley as the use is no longer supported.

HEXACONAZOLE (170)

141. The Committee was informed that this compound is no longer supported and decided to consider the revocation of the CXLs at its Next Session.

PROFENOFOS (171)

142. The Committee was informed that supportive data will be submitted by the manufacturer on cabbage, head ; cotton seed ; cotton seed, oil (edible) ; eggs ; meat (from mammals) ; milks ; peppers, chili ; peppers, sweet ; potato and tomato. The Committee **decided** to recommend revocation of the CXLs for Brussels sprouts ; cauliflower ; common bean (pods and/or immature seeds) ; oranges, sweet, sour ; soya bean (dry) ; soya bean oil, refined ; sugar beet as these uses were no longer supported.

GLUFOSINATE-AMMONIUM (175)

143. The Committee recalled that the policy on MRLs for genetically modified crops had been established at the last Session. That policy was that each compound would be considered on a case-by-case basis. The Committee **decided** to advance all draft MRLs at Step 6 and 6(a) to Step 8, to recommend withdrawal of the CXLs for kiwifruit ; maize forage ; and soya bean, dry, and to delete the asterisk following the MRL for maize fodder.

ABAMECTIN (177)

144. The Committee received a written request by Côte D'Ivoire about early consideration on a MRL for papaya. The Committee requested the Delegation of Côte D'Ivoire to submit the relevant data to JMPR.

CLETHODIM (187)

145. Last year's Committee postponed the advancement of all draft MRLs because the available methods of analysis could not make a distinction between clethodim and sethoxidim. The Delegations of Germany and France informed the Committee that new methods will be submitted to next year's Session. The Committee therefore **decided** to return the draft MRLs to Step 6. The Committee also decided to delete the draft MRLs for cattle kidney, cattle liver, cattle meat, cattle milk, chicken eggs and chicken meat as they were replaced by new group MRL proposals by the 1999 JMPR.

146. The Committee **decided** to withdraw the draft MRL for sunflower seed oil, edible as recommended by the 1997 JMPR.

FENPROPIMORPH (188)

147. The Delegation of Germany explained why the Acute Reference Dose proposed by JMPR 2001 is not acceptable to the EU. Germany will send these comments to JMPR for consideration. However,

even when using the lower German acute reference dose the acute intake of the edible portion of banana was acceptable. Therefore, the Committee **decided** to advance the draft MRL for banana to Step 8.

FENPYROXIMATE (193)

148. The Committee **decided** to return the proposed MRLs for apple ; grapes ; and oranges, sweet, sour to Step 6 pending the establishment of an Acute Reference Dose by the JMPR. The Committee **decided** to advance the MRLs for cattle kidney ; cattle liver ; cattle meat ; cattle milk ; and hops, dry to Step 8.

HALOXYFOP (194)

149. The delegation of Germany stated that the data base for proposing MRLs for peas, cotton seed and sunflower seed were not sufficient. The Committee **decided** not to discuss the proposals at Step 3 pending consideration of the JMPR review of animal transfer studies and returned the other proposed MRLs to Step 6. The Committee **decided** to discuss this compound at next years meeting taking into account the 2001 JMPR evaluation. The Committee was informed by the manufacturer that new toxicological data to refine the ADI would be available for evaluation by the JMPR. The maufacturer will also make available newly available residue data as the racemic mixture of haloxyfop will be replaced by R enantiomer (haloxyfop-R) in nearly all markets globally.

TEBUFENOZIDE (196)

150. The 2001 JMPR noted that these were acute intake concerns for cabbages, head ; grapes ; and leafy vegetables.

151. The Committee **decided** to return the proposed MRL for grapes to Step 6 and consider all commodities next year.

KRESOXIM-METHYL (199)

152. The Committee did not discuss the MRLs at Step 3. The Committee **decided** to advance all Step 6 MRLs to Step 8, noting that the EC favoured a MRL of 0.05 (*) mg/kg for barley.

PYRIPROXIFEN (200)

153. The Committee **decided** to advance all MRLs to Step 8.

DDT (021)

154. The Committee recalled the extensive discussions it had on the EMRL of DDT in meat at previous Sessions. However no agreement could be reached. The Committee noted that JMPR had proposed different management options corresponding to different violation rates. In view of the above the Chairman proposed to retain the CXL for meat at 5 mg/kg on a temporary basis, noting that the compound will be scheduled for a full review at a later stage. The Observer from the EC asked about the legal status of such a provision in relation to the WTO. The FAO Codex Secretariat pointed out that Codex Standards and guidelines are not binding, but are a reference point with regard to the SPS agreement. Countries that adopt a more stringent standard can do so, providing that they can demonstrate that their risk assessment supports the more stringent standard. The delegation of Canada informed the Committee that on the basis of a national dietary risk assessment children under the age of 6 are at the potential risk at a level of 1 mg/kg . The Observer from Consumers International requested an early review on DDT from JMPR because of the Canadian assessment and because of possible endocrine disruption effects. The Committee **agreed** with the proposal from the Chairman to retain the current EMRL at 5 mg/kg (fat) and to delete the EMRL as proposed by the JMPR at 1-5 mg/kg (fat).

155. The Committee noted a proposal from the JMPR for an EMRL of 0.1-0.3 mg/kg for poultry meat (fat) corresponding to different violation rates. The delegation of New Zealand pointed out that there was no accepted international violation rate set in the trade and that a decision on a violation rate in this case should not be considered as a precedent. The delegation of France, supported by the Observer of Consumers International stressed the importance of agreeing on a violation rate from the point of health protection. The Committee acknowledged that the violation rate was important, but noted that there was no consensus within CCPR on this point and **decided** to advance the current EMRL from 3 to 5 and to reconsider it at its next year Session, taking also into account the policy on EMRL setting as agreed in its 32nd Session (ALINORM 1999/24, Appendix VIII).

METHYLBROMIDE (052)

156. The Committee discussed the present situation regarding the phasing out of this compound. However the Committee was aware that the compound was still extensively used in many countries and that alternatives were difficult to find. The Committee noted that methylbromide was subject to the provisions of the Montreal Protocol and that uses in quarantine were considered as essential uses under this Protocol.

MATTERS RELATED TO METHODS OF ANALYSIS FOR PESTICIDE RESIDUES (AGENDA ITEM 7)

157. The Committee decided to consider Agenda Items 7 (a), (b) and (c) together. However, for the purpose of the report they are presented as they appeared on the Provisional Agenda.

158. The Chairman of the *Ad Hoc* Working Group on Methods of Analysis and Sampling, Dr P. van Zoonen introduced the report of the Working Group (CRD 15) and informed the Committee that the Working Group had considered all written comments that were submitted and verbal comments from the members of the Working Group on :

- Proposed amendments to the Proposed Draft Revised Guidelines on Good Laboratory Practice in Pesticide Residue Analysis (Agenda Item 7 (a));
- Proposed Draft Amendments to the Introduction Section of the Recommended Methods of Analysis for Pesticide Residues (Agenda Item 7 (b)); and
- Revision of the List of Methods of Analysis for Pesticide Residues (Agenda Item 7 ©).

159. The Working Group also discussed Estimation of Uncertainty of Results Based on the Analysis of Multiple Peaks and the Recommendations for "Portion of Commodities to which MRLs apply" for tropical crops.

PROPOSED DRAFT AMENDMENTS TO THE GUIDELINES ON GOOD LABORATORY PRACTICE IN PESTICIDE RESIDUE ANALYSIS (Agenda Item 7 (a))[17]

160. Dr van Zoonen informed the Committee that the *Ad Hoc* Working Group had suggested several technical amendments to the Proposed Draft Revised Guidelines on Good Laboratory Practice in Pesticide Residue Analysis (see CRD 15) and pointed out that apart from a few technical comments on the Proposed Draft Amendments to the Introduction Section of the Recommended Methods of Analysis for Pesticide Residues there was general support for these documents.

161. The Committee **concurred** with the content and recommendations in the report of the Working Group and made the following comments and amendments :

[17] ALINORM 01/24A, Appendix VII; CX/PR 02/7 (comments in response to the CL 2001/14-PR); CRD 4 (comments of the European Community); CRD 5 (comments of Germany); CRD 6 (comments of India); CRD 15 (Report of the Ad Hoc Working Group on Methods of Analysis and Sampling).

- The Committee noted that the new concept proposed by the EC regarding the estimation of uncertainty of measurements should be tested with various data sets and that estimates obtained should be compared with the new method and the conventional ones such as described in EURACHEM Guidelines. The Committee encouraged the Delegation of the United States and Germany to submit the relevant data to the United Kingdom in this regard.

- The Committee noted the intervention of the United States that the text presented in CRD 15 in para 4.6.4 did not reflect accurate wording and **agreed** to amend the first sentence of this paragraph to read: "For qualitative confirmation (identity) the use of mass-spectral data, or a combination of techniques based on different physical-chemical properties, is desirable (see Table 6)". The Committee also decided to move the last sentence of this paragraph to the end of paragraph 4.6.1.

162. The Committee **agreed** that there was a need for further information for representative tropical fruits to be included in Table 5 for method validation and requested countries concerned to submit their proposals/information supported by appropriate analytical data. The Committee agreed that this request should be made by means of a Circular Letter.

Status of the Proposed Draft Revision of the Guidelines on Good Laboratory Practice in Pesticide Residue Analysis

163. The Committee **agreed** to advance the Proposed Draft Revision of the Guidelines on Good Laboratory Practice in Pesticide Residue Analysis to Step 5 of the Procedure (see Appendix VI).

PROPOSED DRAFT AMENDMENTS TO THE INTRODUCTION SECTION OF THE RECOMMENDED METHODS OF ANALYSIS FOR PESTICIDE RESIDUES (AGENDA ITEM 7 (B))[18]

164. The Committee concurred with the recommendations of the *Ad Hoc* Working Group (see also para. 161) and **agreed** to advance the Proposed Draft Amendments to the Introduction Section of the Recommended Methods of Analysis for Pesticide Residues to Step 5/8 of the Procedure omitting Steps 6 and 7 for final adoption by the next Session of the Commission (see Appendix V).

DISCUSSION PAPER ON THE REVISION OF THE LIST OF METHODS OF ANALYSIS FOR PESTICIDE RESIDUES (AGENDA ITEM 7 ©)[19]

165. The Committee supported the recommendation of the *Ad Hoc* Working Group relevant to this Agenda Item and **agreed** to request Member Governments and interested observer organizations to provide descriptions of their methods together with their scope and supporting validation data, if available, as applied for the determination of the pesticides in the check list. The full documentation of the methods would be placed on the website of FAO/WHO Training and Reference Centre for Food and Pesticide Control, where platform would also be available for providing comments and sharing experience regarding the methods.

Other matters

166. The Committee **agreed** that problems of multi-component analysis in the Estimation of Uncertainty of Results Based on the Analysis of Multiple Peaks needed to be discussed further in connection with the EU document on new options for estimation of uncertainty and accepted the kind offer of the Representative of FAO/IAEA to prepare a paper for consideration at the next session of the Committee.

167. The Committee noted the need for specific recommendations for commodities such as jack fruit, durian, lychee, etc and **decided** to ask proposals for the identification of tropical fruits and vegetables

[18] ALINORM 01/24A, Appendix VIII; CX/PR 02/8 (comments of Argentina, Brazil, Chile, Cuba, New Zealand, Thailand and the United States); CRD 15 (report of the *Ad Hoc* Working Group).
[19] CX/PR 02/9; CRD 15 (report of the *Ad Hoc* Working Group).

for which the Member States would like to establish national and Codex MRLs. These proposals should be supported with detailed descriptions of the commodity, portion to which the MRL applied and current sample preparation practice.

168. The Committee expressed its appreciation to the members of the Working Group for their valuable work and **agreed** that it should convene again at the next session by the chairmanship of Dr Van Zoonen.

ESTABLISHMENT OF CODEX PRIORITY LIST OF PESTICIDES (AGENDA ITEM 8)[20]

169. The Chairman of the *ad hoc* Working Group on Priorities, Dr T. Doust (Australia), presented the report of the Working Group and highlighted main issues addressed and the changes suggested by the Group for the tentative scheduling of the compounds.

170. The Observer of Consumers International suggested a specific criteria for a new chemical being identified as "safer" be developed. In the discussion that ensued, it was pointed out that governments take a number of factors into account when deciding whether a new chemical is safer than existing ones, including public health, residue and occupational safety, ecotoxicity and environmental fate. However, in the Codex system consumer health protection was the primary consideration. The Committee agreed that the criteria for the prioritisation process should be developed further and ultimately published in the *Procedural Manual.* Dr Doust (Australia) agreed to work with the Codex Secretariat to develop an appropriate text for consideration by the next Session of the ad hoc Working Group and the Committee.

171. At the meeting of the Working Group, the Observer of the EC had proposed that an additional criterion be added that would differentiate between pesticides that are used only in some regions and those used globally. After discussion, the Committee concluded that the current criteria were sufficiently robust to take into account regional differences and there was no need to add the suggested criterion.

172. The Observer of CropLife International expressed concern that the development of specifications by the Joint FAO/WHO Meeting on Pesticide Specifications (JMPS) should not delay JMPR evaluations if specifications were required before pesticides were to be evaluated by JMPR. The Representative of FAO proposed that the process should be phased in over a number of years, beginning in 2006. Under this arrangement, specifications on pesticides to be evaluated by JMPR should begin to be developed by 2004. The Committee was of the view that this was a reasonable approach in that all parties involved would have a chance to see how it functioned before making it mandatory.

173. There was an extensive discussion on the periodic review of pesticides for which EMRLs had been established, including DDT. The Chairman reminded the Committee that the current criteria as described in the report of the Thirty-first Session of CCPR[21] stated that re-evaluations should be performed every 5 years when data were available, but in any event they should be performed at least every 8 years and questioned whether this was reasonable considering the other priorities of JMPR. The Chairman indicated that it was not inconsistent with WTO obligations to defer any such review if there were no trade problems. The Committee **recommended** that the periodic review of environmental contaminants with EMRLs be reconsidered next year by the *ad hoc* working group on priorities, which will make recommendations to the plenary. Issues to be considered were :

- the priority that should be given to former agricultural pesticides with EMRLs vis-à-vis pesticides in the periodic review programme; and
- the amount of new toxicological and monitoring data that would be available for review;
- the potential health risk and trade restrictions;

[20] CX/PR 02/10; CRD 1 (Report of the *ad hoc* Working Group); CRD 2 (Criteria for the prioritisation process for the establishment of Codex priority lists of pesticides); CRD 4 (Comments of the European Community); CRD 12 (Comments of CropLife International); CRD 13 (Rationale for compounds on the Tentative Agenda of the 2002 JMPR residue evaluation).

[21] ALINORM 99/24, Appendix VII.

taking into account the agreed position on setting EMRLs (ALINORM 1999/24A, Appendix VII).

174. The Committee **agreed** that a Circular Letter should be issued this year requesting information on the availability of new toxicological and monitoring data for persistent pesticides. The Committee emphasized that re-evaluations should be based on *new* monitoring data that have been generated since the last evaluation because older monitoring data would not be representative of the present situation and therefore would not serve as a good basis for re-evaluation. The amount of such new data would serve as the basis for establishing priorities.

175. The Representative of WHO informed the Committee that GEMS/Food was collecting data on DDT and other persistent organic pollutants, which were posted on a WHO web site named *Sight.* Interested parties could follow trends in levels of contamination over a period of time on the basis of the information posted on this site.

176. Four new compounds were proposed for addition to the priority list : *fenhexamid* and *pyraclostrobin* (proposed by Germany), *indoxacarb* (proposed by the United States), and *novaluron* (proposed by Israel). The Committee **agreed** to add these pesticides to the priority list.

177. The Committee noted that *hexaconazole, monocrotophos, paclobutrazol,* and *phosphamidon* were not supported for periodic re-evaluation. *Cypermethrin* was no longer supported for re-evaluation by the primary manufacturer (the resolved isomers *alpha*-cypermethrin and *zeta*-cypermethrin would be supported). Because of the possibility that another manufacturer would support cypermethrin, it was tentatively retained on the priority list. The manufacturer of *cyhalothrin* no longer supported the unresolved isomers, but would be providing toxicological and residue data on *lambda*-cyhalothrin, which was added to the priority list.

178. The Committee noted that *cyfluthrin* had been evaluated by JECFA recently, but that an acute reference dose had not been established. The Committee **requested** WHO to place this pesticide on the agenda of a future meeting of JECFA to evaluate its acute toxicity.

179. The tentative schedules of JMPR were modified on the basis of discussion of pesticides under Agenda Item 6 and other considerations. Included among these changes were oxytetracycline and gentamicin, which were removed from the tentative schedule to Annex II of Appendix VII, pending further consideration by FAO and WHO on the use of antibiotics in agriculture and their potential impact on human health. *alpha*-Cypermethrin and *zeta*-cypermethrin were moved from the *new compound* category to periodic re-evaluations, because they would replace the unresolved isomeric mixture that currently had CXLs. JECFA had evaluated the toxicity of *alpha*-cypermethrin, and an evaluation of the toxicity of *zeta*-cypermethrin was tentatively scheduled for evaluation by JECFA in 2004. The priority list is attached as Appendix VII.

180. The Committee **agreed** that an *ad hoc* Working Group on priorities should be convened at its next session under the chairmanship of Australia (Dr Doust).

DISCUSSION PAPER ON TRADE VULNERABILITIES ARISING FROM THE CODEX MRL ESTABLISHMENT PROCESS (AGENDA ITEM 9)[22]

REVIEW OF THE WORKING PROCEDURES OF THE JOINT FAO/WHO MEETING ON PESTICIDE RESIDUES (JMPR) (AGENDA ITEM 12)[23]

181. As agreed during the adoption of the Agenda for the Session, the Committee discussed these two matters together. The discussion paper on Trade Vulnerabilities Arising from the Codex MRL Establishment Process was introduced by the Delegation of the United States and the Review of the

[22] CX/PR 02/11 (Prepared by the United States with the assistance of Australia, Brazil, Canada, Chile, New Zealand, South Africa, European Community and CropLife International); CRD 4 (Comments of the EC); CRD 10 (Comments of Crop Life International); CRD 14 (Submitted by the USA).

[23] CX/PR 02/14 (Executive Summary of a Consultant's Report); CRD 3 (Comments of USA, Consumers International); CRD 11 (Comments of CropLife International).

Working Procedures of the Joint FAO/WHO Meeting on Pesticide Residues was introduced by Mr S.J. Crossley (Australia), Consultant to FAO and WHO.

182. The Delegation of the United States pointed out that the question of trade vulnerabilities had first been raised at the 32nd Session of the Committee. The underlying problem was the lengthy process, ranging from 4 to 8 years, that was required for the elaboration of Codex Maximum Residue Limits for newly introduced, often safer, pesticides. During this period, in those countries where such pesticides had been registered for use, farmers and exporters were reluctant to use them because importing countries that applied Codex MRLs as the basis for their national regulation would reject commodities containing residues of the new pesticides. The paper identified several options, broadly categorized into options that were less resource intensive (Options 1 – 6) and options that were highly resource intensive (Options 7 – 8). These were :

- Option 1: National Government MRLs Become Interim Time-Limited Codex MRLs Pending JMPR Review;
- Option 2: Recommendations of the JMPR Become Interim MRLs Pending CCPR Review;
- Option 3: Give Priority to New Pesticides;
- Option 4: Revise the JMPR Segment of the MRL-Setting Process (with several sub-options);
- Option 5: Adjustments to the Timing of the Sequential Steps;
- Option 6. Harmonize time of National and Codex submissions;
- Option 7: Strengthen the JMPR Segment of the MRL-Setting Process;
- Option 8: Change the Overall Process;

183. The Delegation pointed out that the delays in the current system could mean that countries would turn to more efficient mechanisms, thus rendering the Codex/JMPR process irrelevant.

184. Mr Crossley stressed that for over 40 years, the JMPR had provided high quality independent evaluations of residues and their safety to consumers. However, the Consultant noted that the system had come under considerable strain due to increased demand for more comprehensive and more frequent evaluations with limited resources available for its operation. Mr Crossley pointed out that most of his recommendations were addressed to FAO and WHO, but that they also included options to improve the efficiency and speed of the process within an international “peer review” model. In broad terms these were :

- Option 1 – use of national reviews of data;
- Option 2 – use of temporary advisers/resource experts;
- Option 3 – ‘contracting out’ of data reviews to scientific service companies;
- Option 4 – employment of full time FAO/WHO review staff; and
- Option 5 – use of monographs written by sponsor companies.

185. Mr Crossley also noted that his report had addressed several other issues including openness and transparency and involvement of interested parties. In this regard he had also proposed options for FAO and WHO’s consideration, including :

- allowing the attendance of observers at the JMPR
- incorporating an “interested-party day” into the timetable of the JMPR
- consulting with governments and other interested parties on a ‘preliminary assessment’, before finalization by the next meeting of the JMPR.

186. The Secretary of the Codex Alimentarius Commission drew the Committee's attention to the undertaking of the comprehensive Joint FAO/WHO Evaluation of the Codex Alimentarius Commission and other FAO and WHO Work on Food Standards[24] that had been announced at the 50th Session of the Executive Committee. This Evaluation would also examine the structure, procedures and resources of the expert scientific advisory bodies to Codex. Document CX/PR02/11 had been provided to the Evaluation Team. The report of the Evaluation, together with the comments of the Directors-General, would be submitted to the governing bodies of FAO and WHO in 2003 and to a special session of the Executive Committee as well as to the 25th Session of the Commission.

187. The Committee welcomed the paper prepared by the USA and its drafting partners on Trade Vulnerabilities Arising from the Codex MRL Establishment Process. There was general consensus that steps must be taken to reduce the timeframe for the consideration and adoption of MRLs for new compounds in order to reduce such trade vulnerabilities. It was noted however that the Statutes of the Commission (Article 1a) stated that the Commission's mandate was "protecting the heath of consumers and ensuring fair practices in the food trade" rather than trade facilitation *per se*. The Observer of Consumers International and the CCNASWAP considered that the issue should be viewed while having the utmost regard for public health and safety, for example by giving priority to the assessment of safer replacement chemicals. Several delegations noted that the issues raised in the paper required further in-depth consideration at the national level before consensus could be reached on the various proposals and options contained in the paper.

188. In regard to the "low-cost" options presented in the paper, the Representative of Consumers International suggested that an additional option, namely the establishment of interim MRLs at very low levels (near the limit of quantification) should also be considered.

189. Several delegations expressed an interest in Option 1, the use of National Government MRLs as interim Codex MRLs, while other delegations expressed opposition or reservations. A number of problems were raised including the quality of the national risk assessment and residue evaluation. Delegations stated that criteria or "safeguards" would have to be established to ensure the suitability of national MRLs for Codex purposes and the needs of developing countries would need to be considered. Questions were also raised about the potential of having different national evaluations for the same pesticide/commodity combination and that dietary intakes in other parts of the world might not be adequatly considered.

190. There was less support for Option 2, the use of JMPR MRLs as Interim Codex MRLs Pending CCPR Review. Delegations were of the opinion that bottlenecks in the JMPR prioritisation system meant that this option may not result in major improvements as the underlying problem of inadequate resources for carrying out the evaluations in JMPR was not addressed Several delegations drew attention to a significant problem in accepting the recommendations of JMPR without intergovernmental review as this would raise questions concerning the status of the Interim MRLs within the framework of the WTO Agreements. In the extreme case, it would indicate that there was no future role for CCPR. It was also noted that under such a scenario, the risk assessors would also become the risk managers, thereby violating one of the agreed principles of risk analysis. The Delegation of the Netherlands supported by the Observer of IUPAC suggested that the recommendation of interim MRLs by the CCPR for non-controversial JMPR proposals, after a first discussion in the CCPR, based on the JMPR Report.

191. Delegations expressed interest in the variety of options given under Option 4 of the US paper for revising the JMPR segment of the MRL-setting process, but the Committee noted that these options were addressed in greater detail in the Consultant's paper. Similarly, there was general agreement that adjustments to the timing of CCPR and JMPR sessions (Option 5) had merit. There was very little or no support for Option 6, harmonizing the timing of national and Codex submissions.

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[24] A description of the background and terms of reference of the evaluation had been distributed to Codex Contact Points as document CX/EXEC 02/50/2 and was also available from the FAO website as document PC 87/INF/3.

192. In regard to the options categorized as “resource intensive”, only Option 7, strengthening the JMPR segment of the MRL-setting process was regarded as acceptable by the delegations that spoke, and that replacing the JMPR by regional organizations, such as the OECD was not realistic on a world-wide basis and that such organizations should only have a consultative role.

193. The Delegation of the United States proposed that an attempt should be made to examine the practical application of Option 1 by establishing a working group to consider some case studies under a pilot project for applying this procedure for safer replacement pesticides.

194. The Chairperson noted the divergent views concerning Options 1 and 2. He noted that Option 1 would provide an additional source of Codex MRLs whereas Option 2 would not, although the process would be accelerated. He also proposed that the Committee should return to its former practice of considering the proposed draft MRLs at Step 3 on the basis of the Reports of JMPR from the previous year, without prejudice to the possibility of more detailed consideration at a later stage on the basis of the published Evaluations. This, in his opinion, would go some small way towards speeding up the process. The Committee **agreed** to this proposal.

195. The Committee also **agreed** that feasibility and the procedures for the establishment of Codex Interim MRLs on the basis of Option 1 should be explored further on the basis of intergovernmental review by the CCPR and the Commission. In this regard, the Committee welcomed the suggestion of the United States to develop a working paper on a pilot project for the examination of national MRLs as Interim Codex MRLs for safer replacement pesticides. It **agreed** to establish a Working Group for this purpose led by the United States and composed of Argentina, Australia, Canada, Chile, Egypt, New Zealand, Senegal, South Africa, Sudan, European Community, Consumers International and CropLife International.

196. The Committee **confirmed** that the JMPR was essential to the continued independent international evaluation of pesticide residues. There was strong and broad support for maintaining and strengthening the scientific basis essential to the work of the Committee and for enhancing its credibility and that multidisciplinary approach was desirable in this regard. There was full agreement that the impartiality and integrity of JMPR must be maintained. The Committee noted, however that because of the increasing demands on the process and the additional complexity of evaluations, that the process had become unsustainable and without additional resources the system would fail sooner, rather than later. In this regard, it welcomed the initiative of FAO and WHO to review the process and the depth and breadth of the Consultant’s report.

197. The Committee noted that the recommendations contained in the Consultant’s report were mainly the responsibility of FAO and WHO and that many of the recommendations were interlinked. It therefore refrained from making specific observations on these recommendations.

198. The Committee did, however, have an exchange of views on the matters of openess, transparency and involvement of interested parties. On one hand, it was noted that the presence of observers, including lay observers, in scientific expert committees had become the practice in several countries with generally successful results. It was also suggested that this practice could avoid the situation whereby different scientific bodies, using the same or similar data bases, arrived at different conclusions. On the other hand, it was stated that the presence of observers inhibited free scientific discussion and could prejudice the propriety data submitted to the expert committees thereby restricting confidential company submissions.

199. In relation to avoidance of bias or conflicts of interest, the Committee noted the recommendation of the Codex Alimentarius Commission that FAO and WHO should convene a consultation to review the status and procedures of the expert bodies (ALINORM 01/41, para. 61), but that this consultation had been postponed pending the outcome of the overall Joint FAO/WHO Evaluation that was also expected to make recommendations on this matter. The Committee **agreed** that the matters of openess, transparency, involvement of interested parties, bias and conflict of interests would need to be carefully considered for the future work of the JMPR.

200. The Committee **welcomed** a proposal by the Chairperson to establish a temporary advisory group of interested parties as the "Friends of the JMPR" that would act as an intellectual resource to advise FAO and WHO on means to strengthen the JMPR process. This group, which would include representatives of developing countries, could advise the Organizations on ways to raise extra-budgetary resources for JMPR ; convince governments or other donors on the need for such additional resources ; or even act as a group that could identify such resources, including for example "in-place" secondments to the Organizations of resource persons. It was noted that FAO/WHO would contact the participants of the session in this regard.

CONSIDERATION OF THE ELABORATION OF MRLS FOR SPICES (AGENDA ITEM 10)[25]

201. The Delegation of South Africa introduced the document noting that it had been prepared in cooperation with India, Egypt, Indonesia and the spice trade associations. Sri Lanka and the International Trade Centre (UNCTAD/WTO) had provided additional input. The document focussed on "spices" as defined in Group 028 of the Codex Classification and dried chilli peppers. It considered only the use of pesticides in agricultural production, not post-harvest treatments.

202. The paper pointed out that the majority of spices moving in international trade were produced by millions of small-scale farmers, frequently on farms of less than 10 ha, and usually by inter-cropping. The presence of residues was, therefore, frequently associated with products used for pest control on the main crop rather than on the spices themselves. It was also pointed out that by their nature, the *per capita* consumption of spices was very low, representing less than 0.5% of the diet, based on the WHO regional diets. As a result, TMDI calculations showed that the intakes of residues of all pesticides used on spices were well below the ADI.

203. The paper proposed an alternative approach to the setting of Codex MRLs for spices on the basis of monitoring data. It also recommended that the Committee refer the setting of EMRLs for persistent pesticides (aldrin, BHC, DDT, dieldrin, endrin, heptachlor, hexachlorobenzene and lindane) found on spices to the *Ad Hoc* Working Group on Priorities.

204. The Committee generally **welcomed** the approach proposed in the paper, including the use of monitoring data to establish MRLs for spices. The Delegation of Sudan, however, stated that the Committee should not proceed to the development of MRLs because of the problem of intercropping and the establishment of appropriate GAPs. The Delegation of China suggested that the same approach could be extended to cover tea. The Representative of the EC stated that the use of monitoring data to set MRLs should be examined with caution and should not be used as a precedent. The Delegations of Australia and the United States supported the use of monitoring data to set MRLs for these commodities, but in the case of Australia subject only to strict criteria on its use.

205. The Delegations of Egypt and Morocco recommended that a common MRL should be established covering all spices in the Codex group 028 ; a special case could be made for dried chilli pepper as a processed product for which Codex MRLs had been established for the fresh product. The Delegation of Canada questioned whether or not spices should be treated as processed products for the purpose of Codex MRLs.

206. The Delegations of Egypt and India raised the specific problem of DDT in spices, which in their view was due to a combination of the non-agricultural uses of DDT, persistent presence from prior uses, and the ability of spices to concentrate DDT in their essential oil fractions.

207. The Delegations of Egypt and Jamaica raised the question of technical assistance from importing countries to allow countries to establish GAPs and MRLs for pesticides on tropical products in general, thus avoiding the problems of using monitoring data or extrapolating from other uses.

208. The Committee noted the recommendations of the Melbourne Conference (1999) on International Food Trade Beyond 2000, in particular Recommendation 14 endorsed by the Codex Alimentarius Commission on consideration of the special needs of developing countries. It accepted, in

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25 CX/PR 02/12 (Prepared by South Africa); CRD 4 (Comments of the EC); CRD 6 (Comments of India).

principle, the elaboration of MRLs for spices based on monitoring data provided by the producing country, and agreed that criteria for the development and use of such data needed to be elaborated further but be restricted to pesticides included in the Codex system. It also agreed to explore the availability of suitable monitoring data for this purpose. It agreed that for the moment, this approach would be restricted to spices as defined in Codex group 028.

209. On this basis, the Committee **agreed** that a document should be prepared for consideration at its next session giving further details of the definition of spices, based on the Codex Classification and on the criteria to be applied for the use of monitoring data for setting of MRLs. The Committee invited South Africa and its drafting partners, including the International Organization of Spice Trade Association, to prepare this paper. It also **requested** JMPR to develop guidance for the submission of monitoring data for MRL-setting.

210. The Committee requested the Delegation of South Africa together with their drafting partners to include in their paper information on the type and origin of extraneus residues of persistent pesticides found on spices.

DISCUSSION PAPER ON THE NEED FOR THE REVISION OF THE CODEX CLASSIFICATION ON FOODS AND ANIMAL FEEDS (AGENDA ITEM 11)[26]

211. The Delegation of the Netherlands introduced the document and recalled that there was general support to update the Classification at the last session of the Committee. Countries had therefore been requested to provide information to which extent the Classification should be up-dated and what new commodities should be added. The Delegation informed the Committee that only a limited number of comments had been received. Two options for up-dating the Classification had been identified : a limited update or a substantial update. A limited update would be restricted to the addition of new commodities important in international trade, mainly focussed on products of plant origin, updating of scientific names and consideration of the portions to which MRLs apply ; and a substantial update would include the modifications of the limited update, together with the revision of the grouping and subgrouping of commodities, including the revision of the coding system, the harmonisation of definitions of animal products and the inclusion of processed products.

212. While there was a general support for the revision of the Classification, there were different views expressed regarding the extent of the revision.

213. Several delegations, especially from developing countries, suggested the more comprehensive revision and were of the view that the revision would open the way to eliminate gaps in the current Classification and allow the inclusion of many commodities such as camomile or mint leaves widely used for drinks or tropical/subtropical fruits and vegetables. This could prevent trade disruptions for such commodities.

214. Some countries drew the attention to the necessity of regrouping of commodities in order to solve problems with extrapolation. The Delegation of Thailand was of the view that the basis for grouping should be their agronomic characteristics and consumption patterns rather than geographical conditions. It was indicated that comprehensive revision could be undertaken in co-ordination with other Codex Committees that used classification systems such as Food Additives and Contaminants and Residues of Veterinary Drugs in Food in order to achieve better harmonization and consistency among the uses. The Secretary of the Codex Alimentarius Commission also suggested that consideration should be given to a Codex-wide classification system that would provide a single entry point to the data, while retaining the basic structure and usefulness of the current classifications used by the different Codex Committees.

215. The Delegation of Japan and the Observer of the European Community favoured a limited revision in view of limited resources currently available and due to its possible implications on the existing CXLs.

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26 CX/PR 02/13; CRD 4 (Comments of the Eurpoean Community).

216. The Committee noted that before proceeding with the revision there should be a clear understanding on the terms of reference for the revision and that practical technical problems such as the availability of electronic version of Classification should be solved. The Committee **requested** the Delegation of the Netherlands in co-operation with the Codex Secretariat to prepare a document for consideration by the next session of the Committee that would include : the following matters :

- how the revision could be undertaken practically,
- commodities be added and what should be criteria for the addition of commodities,
- to which extent classification should be up-dated for reasons of extrapolation and harmonization,
- what the impact of the revision would be on the existing CXLs, and
- what were be resource implications?
- inclusion of processed commodities

Member Governments and interested international organizations were encouraged to submit their proposals and suggestions on the above matters.

OTHER BUSINESS AND FUTURE WORK (AGENDA ITEM 12)

217. The Committee noted that the matter of the Joint FAO/WHO Meetings on Pesticide Specifications (JMPS) had been resolved earlier (see Agenda Item 8 para 172).

DATE AND PLACE OF THE NEXT SESSION (AGENDA ITEM 13)

218. The Committee noted that its 35th Session would be held in Rotterdam from 31 March to 5 April 2003. The *ad hoc* Working Group on Priorities would meet on 29 March 2003.

AVE ATQUE VALE

219. The Committee noted the forthcoming retirements of Dr Renate Hans (Germany), Mr Alan Hill (United Kingdom) and Dr John Herrman (WHO Joint Secretary to JMPR). It expressed its strongest appreciation for the contribution that these people had made to its work over many years in the fields of residue evaluation, analytical methodology and toxicological evaluation. Their contributions had strengthened the scientific basis and the overall quality of the recommendations of the Committee in the pursuit of its mandate from the Codex Alimentarius Commission.

220. The Committee also expressed its highest appreciation for the work of its out-going Chairperson, Dr. Wim van Eck. Dr van Eck had guided the Committee's work since 1991 on the basis of thorough preparation and hard work, fair treatment of all participants, and above all a superb sense of humour and humanity that had allowed the Committee to reach consensus on some of the most difficult issues in public health and food and agriculture. The Committee wished him every success in his new endeavours in the World Health Organization.

Annex 1

SUMMARY STATUS OF WORK

Subject	Step	Action by	Document Reference in ALINORM 03/24
Proposed Draft and Draft MRLs	8 and 5/8	25th Session of the CAC	paras 51-155, Appendix II
Proposed Draft MRLs	5	50th Session of the CCEXEC, Governments, 35th CCPR	paras 51-155 Appendix III
Codex Maximum Residue Limits Recommended for Revocation		25th Session of the CAC	paras 51-155 Appendix IV
Proposed Draft Amendments to the Introduction Section of the Recommended methods of Analysis for Pesticide Residues	5/8	25th Session of the CAC	para. 164, Appendix V
Draft and proposed draft MRLs	6/ 3	Secretariat, Governments, CCPR	paras 51-155 Annex II
Proposed Draft Revision of the Guidelines on Good Laboratory Practice in Pesticide Residue Analysis	5	50th Session of the CCEXEC, Governments, 35th CCPR	para. 163, Appendix V
New work: Priority List of Pesticides (new pesticides and pesticides under periodic review)	1	25th CAC, Governments, Australia, 35th CCPR	Appendix VII
Discussion Papers on:			
- Revision of the List of Methods for Pesticide Residues Analysis	-	Netherlands	para. 165
- New Options for the Estimation of Uncertainty		FAO/IAEA	para. 166
- Proposals for new Tropical Fruit and Vegateble Commodities		Netherlands	para. 167
- Estimation of Uncertainty of Measurements		United Kingdom	para. 161
- A pilot project for the examination of national MRLs as Interim Codex MRLs for safer replacement pesticides		United States, Argentina, Australia, Canada, Chile, Egypt, New Zealand, Senegal, South Africa, Sudan, EC, CI, CLI	para. 195
- Proposals for Improvement Methodology for Point Estimates		Netherlands, Australia, US, IUPAC	para. 39
- Risk Analysis Policies Used in Establishing Codex MRLs		Codex Secretariat	para. 47
- Criteria for Prioritization Process		Australia, Codex Secretariat	para. 170
- Elaboration of MRLs for Spices		South Africa, Spice Trade Association	para. 209
- Revision of the Codex Classification of Foods and Animal Feeds		Netherlands, Codex Secretariat	para. 216

DRAFT AND REVISED DRAFT MAXIMUM RESIDUE LIMITS FOR PESTICIDES
(At Steps 3 and 6 of the Codex Procedure)

		MRL	*Step*	*Notes*
MRLs for Consideration at Step 3				
30	**DIPHENYLAMINE**			
JF 226	Apple juice	0.5	3	
MO 1280	Cattle kidney	0.01	3	
MO 1281	Cattle liver	0.05	3	
MM 812	Cattle meat	0.01	3	
ML 812	Cattle milk	0.0004	3	Equivalent to 0.01 mg/kg (*) in the milkfat.
FP 230	Pear	5	3	
32	**ENDOSULFAN**			
VP 522	Broad bean (green pods and immature seeds)	0.5	3	
SB 715	Cacao beans	0.1	3	
SB 716	Coffee beans	0.1	3	
VC 424	Cucumber	0.5	3	
FB 269	Grapes	1	3	
GC 645	Maize	0.1	3	
VC 46	Melons, except watermelon	0.5	3	
FC 4	Oranges, Sweet, Sour	0.5	3	
FS 247	Peach	1	3	
FI 353	Pineapple	2	3	
SO 495	Rape seed	0.5	3	
VD 541	Soya bean (dry)	1	3	
VC 431	Squash, Summer	0.5	3	
SO 702	Sunflower seed	1	3	
VO 448	Tomato	0.5	3	
GC 654	Wheat	0.2	3	
55	**OMETHOATE**			
VB 41	Cabbages, Head	0.5	3	Withdrawal recommended (1998 JMPR)
VR 577	Carrot	0.05	3	Previous CXL being reconsidered at Step 3. Withdrawal recommended (1998 JMPR)
VB 404	Cauliflower	0.2	3	Previous CXL being reconsidered at Step 3. Withdrawal recommended (1998 JMPR)
VS 624	Celery	0.1	3	Previous CXL being reconsidered at Step 3. Withdrawal recommended (1998 JMPR)

		MRL	***Step***	***Notes***
GC 80	Cereal grains	0.05	3	Previous CXL being reconsidered at Step 3. Withdrawal recommended (1998 JMPR)
FC 1	Citrus fruits	2	3	Previous CXL being reconsidered at Step 3. Withdrawal recommended (1998 JMPR)
VL 482	Lettuce, Head	0.2	3	Previous CXL being reconsidered at Step 3. Withdrawal recommended (1998 JMPR)
VL 483	Lettuce, Leaf	0.2	3	Previous CXL being reconsidered at Step 3. Withdrawal recommended (1998 JMPR)
VA 385	Onion, Bulb	0.5	3	Withdrawal recommended (1998 JMPR)
VP 63	Peas (pods and succulent=immature seeds)	0.1	3	Previous CXL being reconsidered at Step 3. Withdrawal recommended (1998 JMPR)
VO 51	Peppers	1	3	Previous CXL being reconsidered at Step 3. Withdrawal recommended (1998 JMPR)
VR 589	Potato	0.05	3	Previous CXL being reconsidered at Step 3. Withdrawal recommended (1998 JMPR)
VR 596	Sugar beet	0.05	3	Previous CXL being reconsidered at Step 3. Withdrawal recommended (1998 JMPR)
VO 448	Tomato	0.5	3	Withdrawal recommended (1998 JMPR)
VR 506	Turnip, Garden	0.2	3	Previous CXL being reconsidered at Step 3. Withdrawal recommended (1998 JMPR)
62	**PIPERONYL BUTOXIDE**			
MO 1280	Cattle kidney	0.3	3	The MRL accommodates external animal treatment.
MO 1281	Cattle liver	1	3	
MM 812	Cattle meat	5	3	The MRL accommodates external animal treatment.
ML 812	Cattle milk	0.2	3	The MRL accommodates external animal treatment.
GC 80	Cereal grains	30	3	
FC 1	Citrus fruits	5	3	
JF 1	Citrus juice	0.05	3	
DF 167	Dried fruits	0.2	3	
PE 112	Eggs	1	3	The MRL accomodates external animal treatment.
VC 45	Fruiting vegetables, Cucurbits	1	3	
VL 483	Lettuce, Leaf	50	3	
OC 645	Maize oil, Crude	80	3	
VL 485	Mustard greens	50	3	
AL 72	Pea hay or pea fodder (dry)	200	3	
AL 528	Pea vines (green)	400	3	
SO 703	Peanut, Whole	1	3	

		MRL	***Step***	***Notes***
VO 51	Peppers	2	3	
PM 110	Poultry meat	5	3	The MRL accomodates external animal treatment.
PO 111	Poultry, Edible offal of	10	3	The MRL accomodates external animal treatment.
VD 70	Pulses	0.2	3	
VL 494	Radish leaves (including radish tops)	50	3	
VR 75	Root and tuber vegetables	0.5	3	
VL 502	Spinach	50	3	
VO 448	Tomato	2	3	
JF 448	Tomato juice	0.3	3	
CM 654	Wheat bran, Unprocessed	100	3	
CF 1211	Wheat flour	10	3	
CF 1210	Wheat germ	100	3	
CF 1212	Wheat wholemeal	30	3	
65	**THIABENDAZOLE**			
VC 46	Melons, except watermelon	1	3	Returned to Step 3 pending new data
FB 275	Strawberry	5	3	
94	**METHOMYL**			
[XX 2]	[Cotton seed, hulls]	0.2	3	
[XX 1]	[Cotton seed, meal]	0.05	3	
[XX 3]	[Rape seed forage]	0.2	3	
[XX 4]	[Soya bean hulls]	1	3	
[XX 5]	[Soya bean meal]	0.2	3	
AL 1020	Alfalfa fodder	20	3	Resulting from consideration of methomyl supervised field trial data.
AL 61	Bean fodder	10	3	Resulting from consideration of methomyl supervised field trial data.
VP 61	Beans, except broad bean and soya bean	1	3	Resulting from consideration of methomyl supervised field trial data.
AB 1	Citrus pulp, Dry	3	3	
OR 691	Cotton seed oil, Edible	0.04	3	
MO 105	Edible offal (mammalian)	0.02	3	Resulting from consideration of methomyl+thiodicarb supervised field trial data.
PE 112	Eggs	0.02	3	Resulting from consideration of methomyl+thiodicarb supervised field trial data.
OR 645	Maize oil, Edible	0.02	3	
FS 14	Plums (including prunes)	1	3	Resulting from consideration of methomyl supervised field trial data.
PM 110	Poultry meat	0.02	3	Resulting from consideration of methomyl+thiodicarb supervised field trial data.
PO 111	Poultry, Edible offal of	0.02	3	Resulting from consideration of methomyl+thiodicarb supervised field trial data.
SO 495	Rape seed	0.05	3	Resulting from consideration of thiodicarb supervised field trial data.

		MRL	***Step***	***Notes***
AL 541	Soya bean fodder	0.2	3	Resulting from consideration of methomyl supervised field trial data.
OC 541	Soya bean oil, Crude	0.2	3	
OR 541	Soya bean oil, Refined	0.2	3	
AS 161	Straw, fodder (dry) and hay of cereal grains and other grass-like plants	10	3	Resulting from consideration of methomyo+thidicarb supervised field trial data.
CM 654	Wheat bran, Unprocessed	3	3	
CF 1211	Wheat flour	0.03	3	
CF 1210	Wheat germ	2	3	
117	**ALDICARB**			
FI 327	Banana	0.2	3	
194	**HALOXYFOP**			
AL 1021	Alfalfa forage (green)	5	3	
MO 1280	Cattle kidney	1	3	
MO 1281	Cattle liver	0.5	3	
MM 812	Cattle meat	0.05	3	
ML 812	Cattle milk	0.3	3	
AV 1051	Fodder beet leaves or tops	0.3	3	
AV 596	Sugar beet leaves or tops	0.3	3	
196	**TEBUFENOZIDE**			
AM 660	Almond hulls	30	3	
TN 660	Almonds	0.05	3	
FI 326	Avocado	1	3	
FB 20	Blueberries	3	3	
VB 400	Broccoli	0.5	3	
VB 41	Cabbages, Head	5	3	The information provided to the JMPR precludes an estimate that the dietary intake would be below the acute RfD. (2001 JMPR)
MO 1280	Cattle kidney	0.02	3	
MO 1281	Cattle liver	0.02	3	
MM 812	Cattle meat	0.05	3	
ML 812	Cattle milk	0.01	3	
FC 1	Citrus fruits	2	3	
FB 265	Cranberry	0.5	3	
DF 269	Dried grapes (=currants, raisins and sultanas)	2	3	
PE 112	Eggs	0.02	3	
VL 53	Leafy vegetables	10	3	The information provided to the JMPR precludes an estimate that the dietary intake would be below the acute RfD. (2001 JMPR)
HH 738	Mints	20	3	
FS 245	Nectarine	0.5	3	
FS 247	Peach	0.5	3	
TN 672	Pecan	0.01	3	

		MRL	***Step***	***Notes***
PM 110	Poultry meat	0.02	3	
SO 495	Rape seed	2	3	
FB 272	Raspberries, Red, Black	2	3	
GS 659	Sugar cane	1	3	
VO 448	Tomato	1	3	

199 KRESOXIM-METHYL

FC 203	Grapefruit	0.5	3	
OC 305	Olive oil, Virgin	0.7	3	
FT 305	Olives	0.2	3	
FC 4	Oranges, Sweet, Sour	0.5	3	

201 CHLORPROPHAM

MM 812	Cattle meat	0.1	3	
ML 812	Cattle milk	0.0005	3	
MO 812	Cattle, Edible offal of	0.01	3	
VR 589	Potato	30	3	The information provided to the JMPR precludes an estimate that the dietary intake would be below the acute RfD for cooked potato.

202 FIPRONIL

FI 327	Banana	0.005	3	
GC 640	Barley	0.002	3	
VB 41	Cabbages, Head	0.02	3	
MO 1280	Cattle kidney	0.02	3	
MO 1281	Cattle liver	0.1	3	
MM 812	Cattle meat	0.5	3	
ML 812	Cattle milk	0.02	3	
PE 112	Eggs	0.02	3	
VB 42	Flowerhead brassicas	0.02	3	
GC 645	Maize	0.01	3	
AS 645	Maize fodder	0.1	3	
AF 645	Maize forage	0.1	3	
GC 647	Oats	0.002	3	
VR 589	Potato	0.02	3	
PM 110	Poultry meat	0.01	3	
PO 111	Poultry, Edible offal of	0.02	3	
GC 649	Rice	0.01	3	
AS 649	Rice straw and fodder, Dry	0.2	3	
GC 650	Rye	0.002	3	
VR 596	Sugar beet	0.2	3	
AV 596	Sugar beet leaves or tops	0.2	3	
SO 702	Sunflower seed	0.002	3	
GC 653	Triticale	0.002	3	
GC 654	Wheat	0.002	3	

203 SPINOSAD

AM 660	Almond hulls	2	3	

		MRL	***Step***	***Notes***
TN 660	Almonds	0.01	3	
FP 226	Apple	0.1	3	
VB 40	Brassica vegetables	2	3	
MO 1280	Cattle kidney	1	3	The MRL accommodates external animal treatment.
MO 1281	Cattle liver	2	3	The MRL accommodates external animal treatment.
MM 812	Cattle meat	3	3	The MRL accommodates external animal treatment.
ML 812	Cattle milk	1	3	The MRL accommodates external animal treatment.
VS 624	Celery	2	3	
FC 1	Citrus fruits	0.3	3	
SO 691	Cotton seed	0.01	3	
OC 691	Cotton seed oil, Crude	0.01	3	
OR 691	Cotton seed oil, Edible	0.01	3	
PE 112	Eggs	0.01	3	
VC 45	Fruiting vegetables, Cucurbits	0.2	3	
FI 341	Kiwifruit	0.05	3	
VL 53	Leafy vegetables	10	3	
VP 60	Legume vegetables	0.3	3	
GC 645	Maize	0.01	3	
AS 645	Maize fodder	5	3	
VO 51	Peppers	0.3	3	
VR 589	Potato	0.01	3	
PM 110	Poultry meat	0.2	3	
MM 822	Sheep meat	0.01	3	The MRL accommodates external animal treatment.
MO 822	Sheep, Edible offal of	0.01	3	The MRL accommodates external animal treatment.
GC 651	Sorghum	1	3	
VD 541	Soya bean (dry)	0.01	3	
FS 12	Stone fruits	0.2	3	
VO 447	Sweet corn (corn-on-the-cob)	0.01	3	
VO 448	Tomato	0.3	3	
AS 654	Wheat straw and fodder, Dry	1	3	

MRLs for Consideration at Step 3(a)

20 2,4-D

FC 1	Citrus fruits	1	3(a)	

30 DIPHENYLAMINE

FP 226	Apple	10	3(a)	

94 METHOMYL

AL 1021	Alfalfa forage (green)	25	3(a)	Resulting from consideration of methomyl supervised field trial data.

		MRL	***Step***	***Notes***
FP 226	Apple	2	3(a)	Resulting from consideration of thiodicarb supervised field trial data. The information provided to the JMPR precludes an estimate that the dietary intake would be below the acute RfD (2001 JMPR)
GC 640	Barley	2	3(a)	Resulting from consideration of methomyl supervised field trial data.
VD 71	Beans (dry)	0.05	3(a)	Resulting from consideration of methomyl supervised field trial data.
VB 40	Brassica vegetables	7	3(a)	Resulting from consideration of methomyl+thiodicarb supervised field trial data. The information provided to the JMPR precludes an estimate that the dietary intake would be below the acute RfD (2001 JMPR)
VS 624	Celery	3	3(a)	Resulting from consideration of methomyl supervised field trial data. The information provided to the JMPR precludes an estimate that the dietary intake would be below the acute RfD (2001 JMPR).
VP 526	Common bean (pods and/or immature seeds)	1	3(a)	Resulting from consideration of methomyl supervised field trial data.
SO 691	Cotton seed	0.2	3(a)	Resulting from consideration of methomyl+thiodicarb supervised field trial data.
VC 45	Fruiting vegetables, Cucurbits	0.1	3(a)	Resulting from consideration of methomyl supervised field trial data. The information provided to the JMPR precludes an estimate that the dietary intake for watermelon would be below the acute RfD (2001 JMPR).
FB 269	Grapes	7	3(a)	Resulting from consideration of methomyl supervised field trial data. The information provided to theJMPR precludes an estimate that the dietary intake would be below the acute RfD (2001 JMPR)
VL 53	Leafy vegetables	30	3(a)	Resulting from consideration of methomyl+thiodicarb supervised field trial data.
GC 645	Maize	0.02	3(a)	Resulting from consideration of methomyl supervised field trial data.
AF 645	Maize forage	50	3(a)	Resulting from consideration of methomyl+thiodicarb supervised field trial data.
MM 95	Meat (from mammals other than marine mammals)	0.02	3(a)	Resulting from consideration of methomyl+thidicarb supervised field trial data.
ML 106	Milks	0.02	3(a)	Resulting from consideration of methomyl+thiodicarb supervised field trial data.

		MRL	***Step***	***Notes***
FS 245	Nectarine	0.2	3(a)	Resulting from consideration of methomyl supervised field trial data.
GC 647	Oats	0.02	3(a)	Resulting from consideration of methomyl supervised field trial data.
AL 528	Pea vines (green)	40	3(a)	Resulting from consideration of methomyl supervised field trial data.
FS 247	Peach	0.2	3(a)	Resulting from consideration of methomyl supervised field trial data.
FP 230	Pear	0.3	3(a)	Resulting from consideration of methomyl supervised field trial data.
VR 589	Potato	0.02	3(a)	Resulting from consideration of methomyl+thiodicarb supervised field trial data.
AL 1265	Soya bean forage (green)	40	3(a)	Resulting from consideration of methomyl supervised field trial data.
GC 654	Wheat	2	3(a)	Resulting from consideration of methomyl supervised field trial data.

151 DIMETHIPIN

SO 691	Cotton seed	1	3(a)	
OR 691	Cotton seed oil, Edible	0.1	3(a)	
MO 105	Edible offal (mammalian)	0.01	3(a)	
PE 112	Eggs	0.01	3(a)	
MM 95	Meat (from mammals other than marine mammals)	0.01	3(a)	
ML 106	Milks	0.01	3(a)	
PM 110	Poultry meat	0.01	3(a)	
PO 111	Poultry, Edible offal of	0.01	3(a)	
SO 495	Rape seed	0.2	3(a)	
SO 702	Sunflower seed	1	3(a)	

MRLs for Consideration at Step 6

7 CAPTAN

FS 13	Cherries	25	6	
DF 269	Dried grapes (=currants, raisins and sultanas)	50	6	
FB 269	Grapes	25	6	
FS 245	Nectarine	3	6	

15 CHLORMEQUAT

CM 650	Rye bran, Unprocessed	10	6	
CM 654	Wheat bran, Unprocessed	10	6	
CF 1211	Wheat flour	2	6	
CF 1212	Wheat wholemeal	5	6	

22 DIAZINON

MM 814	Goat meat	2	6	Confirmed (1999 JMPR)
MO 98	Kidney of cattle, goats, pigs & sheep	0.03	6	Confirmed (1999 JMPR)
MO 99	Liver of cattle, goats, pigs & sheep	0.03	6	Confirmed (1999 JMPR)

		MRL	***Step***	***Notes***
27	**DIMETHOATE**			
GC 640	Barley	2	6	
VB 404	Cauliflower	0.5	6	
GC 654	Wheat	0.2	6	
AS 654	Wheat straw and fodder, Dry	10	6	
32	**ENDOSULFAN**			
VB 400	Broccoli	0.5	6	
VB 403	Cabbage, Savoy	2	6	
VB 41	Cabbages, Head	1	6	Except cabbage, Savoy
VB 404	Cauliflower	0.5	6	
41	**FOLPET**			
FP 226	Apple	10	6	Retain at current status
DF 269	Dried grapes (=currants, raisins and sultanas)	40	6	Retain at current status
VL 482	Lettuce, Head	50	6	Retain at current status
VC 46	Melons, except watermelon	3	6	Retain at current status
VA 385	Onion, Bulb	1	6	Retain at current status
VO 448	Tomato	3	6	Retain at current status
49	**MALATHION**			
AL 1020	Alfalfa fodder	200	6	
AL 1021	Alfalfa forage (green)	500	6	
VS 621	Asparagus	1	6	
VP 61	Beans, except broad bean and soya bean	1	6	
AL 1023	Clover	500	6	
AL 1031	Clover hay or fodder	150	6	
SO 691	Cotton seed	20	6	
OC 691	Cotton seed oil, Crude	13	6	
OR 691	Cotton seed oil, Edible	13	6	
VC 424	Cucumber	0.2	6	
AF 162	Grass forage	200	6	
AS 162	Hay or fodder (dry) of grasses	300	6	
AS 645	Maize fodder	50	6	
AF 645	Maize forage	10	6	
VL 485	Mustard greens	2	6	
VA 385	Onion, Bulb	1	6	
VO 447	Sweet corn (corn-on-the-cob)	0.02	6	
JF 448	Tomato juice	0.01	6	
VL 506	Turnip greens	5	6	
AF 654	Wheat forage (whole plant)	20	6	
AS 654	Wheat straw and fodder, Dry	50	6	
55	**OMETHOATE**			
FP 226	Apple	2	6	Withdrawal recommended (1998 JMPR)

		MRL	***Step***	***Notes***
FS 13	Cherries	2	6	
FB 269	Grapes	2	6	Withdrawal recommended (1998 JMPR)
FP 230	Pear	2	6	Withdrawal recommended (1998 JMPR)
FS 14	Plums (including prunes)	1	6	Changed from 2 mg/kg (1990 JMPR). Withdrawal recommended (1998 JMPR)
AV 596	Sugar beet leaves or tops	1	6	Withdrawal recommended (1998 JMPR)
59	**PARATHION-METHYL**			
AL 1030	Bean forage (green)	1	6	Confirmed (2000 JMPR)
AS 162	Hay or fodder (dry) of grasses	5	6	Confirmed (2000 JMPR)
GC 654	Wheat	5	6	Confirmed (2000 JMPR)
CM 654	Wheat bran, Unprocessed	10	6	Confirmed (2000 JMPR)
AS 654	Wheat straw and fodder, Dry	10	6	Confirmed (2000 JMPR)
60	**PHOSALONE**			
FS 12	Stone fruits	2	6	
72	**CARBENDAZIM**			
FB 18	Berries and other small fruits	1	6	Except grapes. Returned to Step 6 pending data.
VL 482	Lettuce, Head	5	6	Retained pending data.
VO 51	Peppers	0.1	6	Retained
74	**DISULFOTON**			
VS 621	Asparagus	0.02	6	
VD 71	Beans (dry)	0.2	6	Changed from 0.05 mg/kg at Step 7B (1998 JMPR)
VB 400	Broccoli	0.1	6	Changed from 0.2 mg/kg (1994 JMPR).
VB 41	Cabbages, Head	0.2	6	
VB 404	Cauliflower	0.05	6	Changed from 0.2 mg/kg (1994 JMPR).
PE 840	Chicken eggs	0.02	6	
SO 691	Cotton seed	0.1	6	Confirmed (1994 & 1998 JMPR); formerly at Step 7B.
VP 528	Garden pea (young pods)	0.1	6	
VP 529	Garden pea, Shelled	0.02	6	
VL 482	Lettuce, Head	1	6	Confirmed (1998 JMPR); formerly at Step 7B.
VL 483	Lettuce, Leaf	1	6	Confirmed (1998 JMPR); formerly at Step 7B.
ML 107	Milk of cattle, goats & sheep	0.01	6	Changed from 0.02 mg/kg (1994 JMPR).
AS 647	Oat straw and fodder, Dry	0.05	6	Confirmed (1994 JMPR)
PM 110	Poultry meat	0.02	6	
VO 447	Sweet corn (corn-on-the-cob)	0.02	6	
VO 1275	Sweet corn (kernels)	0.02	6	

		MRL	***Step***	***Notes***
AS 654	Wheat straw and fodder, Dry	5	6	Changed from 10 mg/kg (1994 JMPR).
85 FENAMIPHOS				
FP 226	Apple	0.05	6	
OC 691	Cotton seed oil, Crude	0.05	6	
MO 105	Edible offal (mammalian)	0.01	6	
PE 112	Eggs	0.01	6	
MM 95	Meat (from mammals other than marine mammals)	0.01	6	
ML 106	Milks	0.005	6	
OC 697	Peanut oil, Crude	0.05	6	
VO 51	Peppers	0.5	6	
PO 111	Poultry, Edible offal of	0.01	6	
VC 432	Watermelon	0.05	6	
87 DINOCAP				
FB 269	Grapes	0.5	6	
90 CHLORPYRIFOS-METHYL				
GC 640	Barley	10	6	Confirmed (1994 JMPR). The CCPR-31 returned the MRL to Step 6 for reconsideration at the CCPR-32 (31.74).
GC 647	Oats	10	6	Confirmed (1994 JMPR). The CCPR-31 returned the MRL to Step 6 for reconsideration at the CCPR-32 (31.74).
96 CARBOFURAN				
VC 4199	Cantaloupe	0.2	6	Returned to Step 6 due to intake concerns (32.116)
VC 424	Cucumber	0.3	6	Returned to Step 6 due to intake concerns (32.116)
FC 206	Mandarin	0.5	6	Based on the use of carbosulfan.
FC 4	Oranges, Sweet, Sour	0.5	6	Based on the use of carbosulfan. Returned to Step 6 due to intake concerns (32.116)
VC 431	Squash, Summer	0.3	6	Returned to Step 6 due to intake concerns (32.116)
VO 447	Sweet corn (corn-on-the-cob)	0.1	6	Confirmed (1999 JMPR). Returned to Step 6 due to intake concerns (32.116)
100 METHAMIDOPHOS				
FS 247	Peach	1	6	Based on the residues from the use of methamidophos. Returned to Step 6 due to intake concerns (32.118)
FP 9	Pome fruits	0.5	6	Confirmed (1997 JMPR). Returned to Step 6 due to intake concerns (32.118)

		MRL	***Step***	***Notes***
VO 448	Tomato	1	6	Based on residues from the use of methamidophos or acephate. Returned to Step 6 due to intake concerns (32.118)

106 ETHEPHON

DF 269	Dried grapes (=currants, raisins and sultanas)	5	6	

145 CARBOSULFAN

AB 1	Citrus pulp, Dry	0.1	6	
FC 206	Mandarin	0.1	6	
FC 4	Oranges, Sweet, Sour	0.1	6	

166 OXYDEMETON-METHYL

FP 226	Apple	0.05	6	
GC 640	Barley	0.05	6	
AS 640	Barley straw and fodder, Dry	2	6	
VB 41	Cabbages, Head	0.05	6	
MF 812	Cattle fat	0.05	6	
VD 526	Common bean (dry)	0.1	6	
SO 691	Cotton seed	0.05	6	
PE 112	Eggs	0.05	6	
FB 269	Grapes	0.1	6	
VL 480	Kale	0.01	6	
VB 405	Kohlrabi	0.05	6	
FC 204	Lemon	0.2	6	
MM 97	Meat of cattle, pigs & sheep	0.05	6	
ML 106	Milks	0.01	6	
FC 4	Oranges, Sweet, Sour	0.2	6	
FP 230	Pear	0.05	6	
MF 818	Pig fat	0.05	6	
VR 589	Potato	0.05	6	
PF 111	Poultry fats	0.05	6	
PM 110	Poultry meat	0.05	6	
GC 650	Rye	0.05	6	
AS 650	Rye straw and fodder, Dry	2	6	
MF 822	Sheep fat	0.05	6	
VR 596	Sugar beet	0.05	6	
AV 596	Sugar beet leaves or tops	0.05	6	
GC 654	Wheat	0.05	6	
AS 654	Wheat straw and fodder, Dry	2	6	

187 CLETHODIM

AL 1020	Alfalfa fodder	10	6	
AL 61	Bean fodder	10	6	
AL 1030	Bean forage (green)	5	6	
VD 71	Beans (dry)	2	6	

		MRL	***Step***	***Notes***
VP 61	Beans, except broad bean and soya bean	0.5	6	
SO 691	Cotton seed	0.5	6	
OC 691	Cotton seed oil, Crude	0.5	6	
OR 691	Cotton seed oil, Edible	0.5	6	
MO 105	Edible offal (mammalian)	0.2	6	
VD 561	Field pea (dry)	2	6	
AM 1051	Fodder beet	0.1	6	
VA 381	Garlic	0.5	6	
MM 95	Meat (from mammals other than marine mammals)	0.2	6	
ML 106	Milks	0.05	6	
VA 385	Onion, Bulb	0.5	6	
SO 697	Peanut	5	6	
VR 589	Potato	0.5	6	
PM 110	Poultry meat	0.2	6	
SO 495	Rape seed	0.5	6	
OC 495	Rape seed oil, Crude	0.5	6	
OR 495	Rapeseed oil, Edible	0.5	6	
VD 541	Soya bean (dry)	10	6	
OC 541	Soya bean oil, Crude	1	6	
OR 541	Soya bean oil, Refined	0.5	6	
VR 596	Sugar beet	0.1	6	
SO 702	Sunflower seed	0.5	6	
OC 702	Sunflower seed oil, Crude	0.1	6	
VO 448	Tomato	1	6	

193 FENPYROXIMATE

FP 226	Apple	0.3	6	
FB 269	Grapes	1	6	
FC 4	Oranges, Sweet, Sour	0.2	6	

194 HALOXYFOP

PE 840	Chicken eggs	0.01	6	
PM 840	Chicken meat	0.01	6	
PO 840	Chicken, Edible offal of	0.05	6	
SO 691	Cotton seed	0.2	6	
OC 691	Cotton seed oil, Crude	0.5	6	
AM 1051	Fodder beet	0.3	6	
SO 697	Peanut	0.05	6	
VP 63	Peas (pods and succulent=immature seeds)	0.2	6	
VR 589	Potato	0.1	6	
VD 70	Pulses	0.2	6	
SO 495	Rape seed	2	6	
OC 495	Rape seed oil, Crude	5	6	
OR 495	Rapeseed oil, Edible	5	6	
CM 1206	Rice bran, Unprocessed	0.02	6	
CM 649	Rice, Husked	0.02	6	

		MRL	***Step***	***Notes***
CM 1205	Rice, Polished	0.02	6	
OC 541	Soya bean oil, Crude	0.2	6	
OR 541	Soya bean oil, Refined	0.2	6	
VR 596	Sugar beet	0.3	6	
SO 702	Sunflower seed	0.2	6	

196 TEBUFENOZIDE

FB 269	Grapes	2	6	

MRLs for Consideration at Step 6(a)

7 CAPTAN

FP 226	Apple	20	6(a)	
FS 14	Plums (including prunes)	10	6(a)	
FB 275	Strawberry	15	6(a)	
VO 448	Tomato	5	6(a)	

15 CHLORMEQUAT

GC 650	Rye	3	6(a)	
GC 654	Wheat	3	6(a)	

20 2,4-D

FC 203	Grapefruit	0.1	6(a)	Withdrawal recommended (2001 JMPR)
FC 4	Oranges, Sweet, Sour	0.1	6(a)	Withdrawal recommended (2001 JMPR)

22 DIAZINON

VB 41	Cabbages, Head	0.5	6(a)	
MM 97	Meat of cattle, pigs & sheep	2	6(a)	Confirmed (1999 JMPR)
FP 9	Pome fruits	0.3	6(a)	

27 DIMETHOATE

VB 402	Brussels sprouts	1	6(a)	
FB 269	Grapes	2	6(a)	
VL 482	Lettuce, Head	0.5	6(a)	
VP 63	Peas (pods and succulent=immature seeds)	1	6(a)	
FS 14	Plums (including prunes)	1	6(a)	
FP 9	Pome fruits	0.5	6(a)	
AV 596	Sugar beet leaves or tops	0.1	6(a)	
VO 448	Tomato	2	6(a)	
VR 506	Turnip, Garden	0.1	6(a)	

41 FOLPET

VC 424	Cucumber	1	6(a)	Retain at current status
FB 269	Grapes	10	6(a)	Retain at current status
VR 589	Potato	0.1	6(a)	Retain at current status
FB 275	Strawberry	5	6(a)	Retain at current status

		MRL	***Step***	***Notes***
49	**MALATHION**			
FB 20	Blueberries	10	6(a)	
GC 645	Maize	0.05	6(a)	
GC 651	Sorghum	3	6(a)	
GC 654	Wheat	0.5	6(a)	
60	**PHOSALONE**			
FP 9	Pome fruits	2	6(a)	
74	**DISULFOTON**			
GC 640	Barley	0.2	6(a)	Confirmed (1994 JMPR).
GC 645	Maize	0.02	6(a)	Changed from 0.01 mg/kg at Step 7B (1998 JMPR).
AF 647	Oat forage (green)	0.5	6(a)	Confirmed (1994 JMPR)
GC 647	Oats	0.02	6(a)	Confirmed (1994 JMPR)
GC 654	Wheat	0.2	6(a)	Confirmed (1994 JMPR).
AF 654	Wheat forage (whole plant)	1	6(a)	Changed from 2 mg/kg (1994 JMPR).
85	**FENAMIPHOS**			
FI 327	Banana	0.05	6(a)	
VB 402	Brussels sprouts	0.05	6(a)	
VB 41	Cabbages, Head	0.05	6(a)	
VO 448	Tomato	0.5	6(a)	
90	**CHLORPYRIFOS-METHYL**			
GC 649	Rice	10	6(a)	The CCPR-31 returned the MRL to Step 6 for reconsideration at the CCPR-32 (31.74).
103	**PHOSMET**			
FS 240	Apricot	10	6(a)	
117	**ALDICARB**			
VR 589	Potato	0.5	6(a)	The 1996 JMPR converted the previous temporary status to full status. Confirmed (2001 JMPR).

Appendix I

LIST OF PARTICIPANTS
LISTE DES PARTICIPANTS
LISTA DE PARTICIPANTES

Chairman of the Session:
Président de la Session:
Président de la Reunión:

Dr Wim H. van ECK
Ministry of Health, Welfare and Sport
Postbox 20350
2500 EJ The Hague
The Netherlands
Tel.: +31 70 3406966
Fax: +31 70 3405554
E-mail: wh.v.eck@minvws.nl

ALGERIA/ALGÉRIE/ARGELIA

Mr Ali BOUDIFA
Responsable du Bureau de la Vigilance
A'l'utilisation des Pesticides
Ministère de l'Agriculture
12 Boulevard. Colonel Amiroiche
Alger
Algerie
Tel.: +021 71 17 12
Fax: +021 42 93 49
E-mail: bhp@altrista.fr

ARGENTINA/ARGENTINE

Ms Silvia A. RAIOLA
Counsellor of Embassy of Argentina
Javastraat 20
2585 AN THE HAGUE
Tel :+31 70 3654836/37
Fax:+31 70 3924900
E-mail : sar@mrecic.gov.ar

AUSTRALIA/AUSTRALIE

Dr Angelo VALOIS
Manager - Technical and International Policy
Product Safety and Integrity
Product Integrity, Animal and Plant Health
Dept. of Agriculture, Fisheries and Forestry Australia
GPO Box 858
Canberra ACT 2601
Ph: +61 2 6272 5566
Fax: +61 2 6272 5697
Email: angelo.valois@affa.gov.au

Dr Ian REICHSTEIN
Manager
Grains and Horticulture
National Residue Survey
Product Integrity, Animal and Plant Health
Dept. of Agriculture, Fisheries and Forestry Australia
GPO Box 858
Canberra ACT 2601
Ph: +61 2 6272 5652
Fax: +61 2 6272 5697
Email: ian.reichstein@affa.gov.au

Dr Dugald MacLachlan
Australian Quarantine & Inspection Service
GPO Box 858
Canberra ACT 2601
Phone: +61 2 6272 3183
Fax: +61 2 6272 4112
Email: dugald.maclachlan@aqis.gov.au

Mr Steve CROSSLEY
Australia New Zealand Food Authority
Food Monitoring and Surveillance
PO Box 7186
Canberra MC ACT 2601
Ph: +61 2 6271 2624
Fax: +61 2 6272 2278
Email: steve.crossley@anzfa.gov.au

Dr Trevor DOUST
Manager – Chemistry and Residues Evaluation
National Registration Authority for Agricultural and
eterinary Chemicals
PO Box E 240
KINGSTON, ACT 2604
Ph: +61 2 6272 3208
Fax: +61 2 6272 3551
Email: tdoust@nra.gov.au

Dr Ian ECKHARD
Senior Residues Chemist
Australian Government Analytical Laboratory
PO Box 385
Pymble NSW 2073
Ph: +61 2 9449 0171
Fax: +61 2 9449 1653
Email: ian.eckhard@agal.gov.au

Mr Graham ROBERTS
Dept Natural Resources and Enivironment
Cnr Sneydes & South Roads
WERRIBEE, VIC 3030
Ph: +61 3 9742 8714
Fax: +61 3 9742 8700
Email: graham.roberts@nre.vic.gov.au

Dr Fay STENHOUSE
AVCARE Limited
Locked Bag 916
Canberra ACT 2601
Ph: +61 2 6230 6399
Fax: + 61 2 6230 6355
Email: sracp@avcare.org.au

Mr Kevin Bodnaruk
Horticulture Australia LTD
Ph: +61 2 9499 3833
Fax: +61 2 9499 6055
Email: akc_con@zip.com.au

Mr Bill MURRAY
Grains Research and Development Corporation
22 Thornley Close
FERNTREE GULLY, VIC 3156
Ph: +61 3 9763 8696
Email: murraywj@alphalink.com.au

AUSTRIA/AUTRICHE

Mrs Dipl.Ing. Hermine REICH
Federal Office and research Centre for Agriculture
Spargelfeldstrasse 19
1220 Vienna
Tel.: +43 1 73216 5130
Fax: +43 1 73216 5194
E-mail : hreich@bfl.at

Mr Dr. Hans Dietmar ÖSTERREICHER
Federal Ministry of Social Security and Generation
Div.IX/B/2
Radetzkystrasse 2
1030 Vienna
Tel.: +43 1 71100 / 4792
Fax: +43 1 7137952
E-mail : dieter.oesterreichter@bmsg.gv.at

BANGLADESH

Mr Kabir BIN ANWAR
First Secretary
Embassy of the People's Republic of Bangladesh
Wassenaarseweg 39
2596 CJ Den Haag
Tel.:+31 70 3283722
Fax: +31 70 3283524

BELGIUM/BEELGIQUE/BÉLGICA

Ir L. MOHIMONT
Ministère des Classes Moyennes et de l'Agriculture
Inspection générale Matières premières et Produits transformés
WTC III – 8e étage
Bd S. Bolivar 30
B-1000 Bruxelles
Tel.: +32 2 208 38 42
Fax: +32 2 208 38 66
E-mail: Luc.Mohimont@cmlag.fgov.be

Ir Olivier N.M.G. PIGEON
Ministère des Classes Moyennes et de l'Agriculture
Centre de Recherches Agronomiques
Département Phytopharmacie
Rue du Bordia 11
B-5030 Gembloux
Tel.: +32 81 625262
Fax: +32 81 62 52 72
E-mail: pigeon@cragx.fgov.be

Dr Christine VINKX
Ministère des Affaires Sociales de la Santé publique et de l'Environnement
Inspection générale des Denrées alimentaires
C.A.E. Quartier Esplanade 11e étage
Bd Pachéco 19 bte 5
B-1010 Brussel
Tel.: +32 2 210 48 37
Fax: +32 2 210 48 16
E-mail: christine.vinkx@health.fgov.be

BRAZIL/BRÉSIL/BRASIL

Mr Arlindo BONIFÁCIO
Ministry of Agriculture
Esplanada dos Ministerios-Bloco D
Anexo A-3° Andar Sala 350
CEP-70.043-900 Brasilia / DF
Brazil
Tel.: + 55 61 218 2445
Fax: + 55 61 225 5341
E-mail: arlindo@agricultura.gov.br / arbonifacio@hotmail.com

Mrs Heloisa Helena Barretto de TOLEDO
Chemist
Head of Department of Pesticide Residues
Instituto Adolfo Lutz
Av. Dr. Arnaldo 355
01246-902- Sao Paulo – SP
Brazil
Tel.: +55 11 30682945
Fax: +55 11 30641527
E-mail: hetoledo@hotmail.com

Mrs Cleide M.C.M. de OLIVEIRA
Chemist
GARP - Assoc. Grupo de Analistas de
Residuos de Pesticidas
Rua Breves 363
CEP 04645-000 Sao Paulo / SP
Brazil
Tel.: + 55 11 522-3504
Fax: + 55 11 546-8969
E-mail: ocleide@uol.com.br or
olcleide@hotmail.com

Mrs Rosemarie de S. O. RODRIGUES
Gerente Registro
Syngenta Protecão de Cultivos Ltda
Brazil
Tel : +55 61 56432162 / 2166
Fax: +55 61 56433253
E-mail: rose.rodrigues@syngenta.com

Mr Flavio RODRIGUES PUGA
Secretariat of Agriculture of the State of Sao Paulo
Av. Cons.Rodrigues Alves 1252
Vila Mariana
CEP 04014-002 SAO PAULO
Brazil
Tel.: + 55 11 50871757
Fax: + 55 11 50871798
E-mail : puga@biologico.br

Mr Lucas MEDEIROS DANTAS
Gerente Geral de Toxicologia
ANVISA/MS
SEPN, Q, 515, Bloco B
Ed.Ômega, 3 Andar
CEP: 70.770-502 Brasilia- DF
Brazil
Tel.: +55 61 4481116
Fax: +55 61 4481080
E-mail: lucas.medeiros@anvisa.gov.br

Luiz Claudio MEIRELLES
Gerente Geral de Toxicologia
ANVISA/MS
SEPN, Q, 515, Bloco B
Ed.Ômega, 3 Andar
CEP: 70.770-502 Brasilia- DF
Brazil
Tel.: +55 61 4481082
Fax: +55 61 4481076
E-mail: luiz.meirelles@anvisa.gov.br

Mr Guilherme Luiz GUIMARAES
Especialista em Regulamentação e Registro
SINDAG
Av. Irai 393
11 Andar cj 114 – Moem/SP
Brazil
Tel.: +55 11 55432168
Fax: +55 11 50967333
E-mail: glguimaraes@dow.com

Mr Luiz Carlos BHERRING NASSER
Coordenador Substituto da
LAV/DDIV/SDA/MAPA
MAPA/DDIV/CLAV
Esplanada dos Ministerios Bloco “D” Anexo “B”
70043-900-Brasilia/DF
Tel.: +55 61 2182335
Fax: +55 61 2255098
E-mail: luiznasser@agricultura.gov.br

Mrs Wanda E. MOYA GIMENEZ
Coordenadora de Registro
ANDEF
Rua Capitão Antonio Rosa, 376, 13° Andar
São Paulo – SP
Tel.: +55 11 30815033
Fax: +55 11 30536237
E-mail: wanda.gimenez@basf-sa.com.br

CANADA

Dr Ariff ALLY
Section Head, FREAS
Health Evaluation Division
Pest Management Regulatory Agency
Health Canada
Sir Charles Tupper Building
2270 Riverside Drive (6605E)
Ottawa, Ontario
K1A 0K9
Tel.: +1 613 736-3549
Fax: +1 613 736-3509
Email address: afiff_ally@hc-sc.gc.ca

Ms Josée Nadon
Senior Advisor
International Program
Bureau of Food Regulatory, International
And Interagency Affairs
Food Directorate, Health Products and Food Branch
Health Canada
HPB Building, Room 2396 (0702CI)
Tunney’s Pasture
Ottawa, Ontario
KiA OL2
Tel.: +1 613 9578917
Fax: +1 613 9413537
Email address: josee_nadon@hc-sc.gc.ca

Ms Donna J. GRANT
Chemist, Pesticide Residues
Calgary Laboratory
Canadian Food Inspection Agency
CFIA – Calgary Laboratory
3650 – 36 St., N.W.
Calgary, Alberta
T2L 2L1
Tel.: +403 2997636
Fax: +403 2213293
E-mail: grantd@inspection.gc.ca

CHILE/CHILI

Mr Arturo C. CORREA BRIONES
Jefe Subdepartamento de Plaguicidas Y
Fertilizantes, Ministerio de Agricultura
Dirección Avenida Bulnes N° 140
Tercer Piso
Tel.: +56 2 6950805
Fax: + 56 2 6879607
E-mail: arturo.correa@sag.gob.cl

Dr Roberto H. GONZALEZ
Professor de Entomologia
Departamento de Sanidad Vegetal
Casilla 1004
Santiago
Chile
Tel : + 56-2 6785714-6785715
Fax: + 56-2 5417055-6785812
E-mail : rgonzale@abello.dic.uchile.cl

Mrs Jimena López ARAVENA
Jefa Departamento Frutas y Hortalizas
Asociación de Exportadores de Chile A.G.
Dirección: Cruz del Sur 133
Piso 2 Las Condes
Tel.: +56 2 2066604
Fax: +56 2 2064163
E-mail: jlopez@asoex.cl

CHINA/CHINE

Mr Zongmao CHEN
President, Tea Science Society of China
Professor, Tea Research Institute
Chinese Academy of Agricultural Sciences
No., Yunqi Road
Hangzhou Zhejiang 310008
P.R.C.
Tel: + 0571 86590100
Fax: + 0571 86590056
E-mail: prltri@mail.hz.zj.cn

Mr Xiao Wei LIU
Professor
Agroenviron Monitoring General Station
Ministry of Agriculture
31 Fukang Rd Tianjin
P.R. China, 300191
Tel: + 022 23621217
E-mail: xwliu@eyou.com

Mr Bing He YI, Ph.D
Deputy Director
Pesticide Residue Division
Ínstitute for the Control of Agrochemicals, Ministry of Agriculture (ICAMA)
Building 22, Maizidian Street
Chaoyang District
Beijing 100026
P.R. China
Tel: + 86 10 65936997
Fax: + 86 10 64194078
E-mail: heyibing@agri.gov.cn

Mr Yun Zheng LOU
Agronomist
ICAZJ
The Test Centre of Pesticide Quality and Residue control
Agriculture Ministry (Hangzhou.P.R.C.)
29 Fengqi east Road, Hangzhou, P.R.C. 310020
Tel: +86571 86968657
Fax: +86571 86981815
E-mail: hatason_1002@163.net

Dr Yongning WU
Professor and Director
Department of Contaminant Chemistry
Institute of Nutrition and Food Safety
Chinese Center for Disease Control and Prevention
29 Nanwei Road
Beijing, 100050
China
Tel: +86 10 83164557
Fax: +86 10 67501893
e-mail: wuyn@public.bta.net.cn

Mr Tairan LI
Deputy Director
Department of Food Safety Control
Institute of Nutrition and Food Safety
Ministry of Health
1 Pan Jia Yuan Nan Li
Beijing, 100021
China
Tel: +86 10 68792403
Fax: +86 10 68792408
e-mail: litr@95777.com

Mr Ming-Geng MA
Senior Officer
Department of Social and Agriculture Development
Ministry of Science and Technology
Fuxing Road , B 15
Beijing
China
Tel: +86 10 68587219
Fax: +86 10 68512163
e-mail: mamg@mail.most.gov.cn

COLOMBIA/COLOMBIE

Mrs Ana J. TORRADO
Corrdinadora Grupo
Inocuidad Cadenas Agroalimentarias Agricolas
Instituto Colombiano Agropecuario – ICA
Calle 37 No.8-43-4° Piso
A.A. 151123
Bogotá
Colombia
Tel. : + 571 3443166
Fax: + 571 3443165
E-mail : proyectos.agricolos@ico.gov.co

CUBA

Lic. José Antonio ARIAS VERDÉS
Instituto de Nutrción e Higiene de los Alimentos
Ministerio de Salud Pública
Infanta Nº 1158 e/Llinas y Clavel
Habana
Tel.: +53 7 553134
Fax: +53 7 229366
E-mail: inha@infomed.cu

Lic. Rafael Humberto HERNÁNDEZ POEY
Instituto de Investigación en Sanidad Vegetal
Ministerio de la Agricultura
Calle 110 Nº 514 Playa
Habana
Tel.: +53 7 296189
Fax: +53 7 229366
E-mail: inisav@ceniai.inf.cu

CZECH REPUBLIC/RÉPUBLIQUE TCHÈQUE REPÚBLICA CHECA

Mrs Helena MALOŇOVÁ
Head of Division for Pesticide
National Institute of Public Health
Srobárova 48
100 42 PRAHA 10
Tel.: +420 2 6708 2377
Fax: +420 2 6731 0291

DENMARK/DANEMARK/DINAMARCA

Mr Arne BÜCHERT
Head of Division, MSc
Danish Veterinary and Food Administration
Mørkhøj Bygade 19
DK-2860 Søborg
Tel: +45 339 56461
Fax: +45 339 56001
E-mail: **ab@fdir.dk**

Mrs Bodil HAMBORG JENSEN, MSc.
Danish Veterinary and Food Administration
Mørkhøj Bygade 19
DK-2860 Søborg
Tel: +45 339 56000
Fax: +45 339 56001
E-mail: bhj@fdir.dk

EGYPT/EGYPTE/EGIPTO

Dr Salwa DOGHEIM
Director of the Central Laboratory of Residue Analysis of Pesticides and Heavy Metals in Food
Ministry of Agriculture
Agriculture Research Center
7 Nadi El-Said St.
Dokki, Giza
Egypt
Tel.: +202 760 1395
Fax: +202 7611216
E-mail: gcap@intouch.com

FINLAND/FINLANDE/FINLANDIA

Mr Vesa TUOMAALA
Senior Adviser
Ministry of Trade and Industry
P.O. Box 32
00023 Government
Finland
Tel.: +358 9 1606 3553
Fax: +358 9 160 6 2670
E-mail: vesa.tuomaala@ktm.fi

Mr Pekka RAVIO
Chemist
Customs Laboratory
P.O. Box 53
02151 Espoo
Finland
Tel.: +358 9 614 3276
Fax: +358 9 463 383
E-mail: pekka.ravio@tulli.fi

Mrs Pirjo-Liisa PENTTILÄ
Head of Development
Ministry of Agriculture and Forestry
P.O. Box 30
00023 Government
Finland
Tel.: +358 9 16088780
Fax: +358 9 16088871
E-mail: pirjo-liisa.penttila@mmm.fi

Mr Hans BLOMQVIST
Head of Division
Plant Production Inspection Centre
Pesticide Division
P.O. Box 42
00501 Helsinki
Tel.: + 358 9 13421537
Fax: + 358 9 13421421
E-mail: hans.blomqvist@kttk.fi

FRANCE/FRANCIA

Mr Jean-Pierre CUGIER
Ministère de l'Agriculture, de la Pêche et de l'Alimentation
DGAL/SDPV
INRA/GRAPPA
Domaine Saint Paul
Site Agroparc
84914 AVIGNON CEDEX 9
Tel.: +33 432 72 2197
Fax: +33 4 9089 6905
E-mail: cugier@avignon.inra.fr

Mr Bemard DECLERCQ
Ministère de l'Economie et des Finances
Laboratoire interrégional de la DGCCRF
23, Avenue de la République
91305 MASSY CEDEX
Tel.: +33 1 6953 8750
Fax: +33 1 6953 8725
E-mail: Bernard.declerq@dgccrf.finances.gouv.fr

Mrs Célia AZOYAN
Ministère de l'Economie et des Finances
DGCCRF
Bureau C 2 – Télédoc 051
59, Boulevard Vincent Auriol
75703 Paris Cedex 13
Tel.: +33 1 44 97 24 68
Fax: +33 1 44 97 24.86
E-mail: celia.azoyan@dgccrg.finances.gouv.fr

Mr Pascal AUDEBERT
SGCI
Secteur AGRAP/CODEX
Carré Austerlitz
2, Boulevard Diderot
75572 Paris Cedex 12
Tel.: +33 01 44 87 1603
Fax: +33 01 44 87 16 04
E-mail: pascal.audebert@sgci.finances.gouv.fr or
Sgci-codex-fr@sgci.finances.gouv.fr

GERMANY/ALLEMAGNE/ALEMANIA

Dr Renate HANS
Direktor und Professor
Bundesinstitut für gesundheitlichen
Verbraucherschutz und Veterinärmedizin
Postfach 33 00 13
D-14191 Berlin
Tel.: +49 1888 412 3383
Fax: +49 1888 412 3894
E-mail: r.hans@bgvv.de

Ms Anja FRIEL
Wissenschaftliche Angestellte
Bundesinstitut für gesundheitlichen
Verbraucherschutz
Und Veterinärmedizin
Postfach 331013
D-14191 Berlin
Tel.: +49 1888 412 3653
Fax:: +49 1888 412 3894
E-mail: a.friel@bgvv.de

Dr Lutz ALDER
Wissenschaftlicher Oberrat
Bundesinstitut für gesundheitlichen
Verbraucherschutz und Veterinärmedizin
Postfach 330013
D-14191 Berlin
Tel.: +49 1888 412 3377
Fax: +49 1888 412 3685
E-mail: l.alder@bgvv.de

Mr Peter BAUMANN
Ministerium für Umwelt, Raumordnung
und Landwirtschaft
Des Landes Nordrhein-Westfalen
Chemisches und Lebensmittelntersuchungsamt
Der Stadt Dortmund
Hövelstrasse 8
44137 Dortmund
Tel: +49 231 50 23 646
Fax: +49 231 50 23 651
E-mail: pbaumann@stadtdo.de

Dr Ursula BANASIAK
Wissenschaftliche Direktorin
Biologische Bundesanstalt für Land- und Forstwirtschaft
Stahnsdorfer Damm 81
D-14532 Kleinmachnow
Tel.: +49 33203 48338
Fax: +49 33203 48425
E-mail: u.banasiak@bba.de

Dr Karsten HOHGARDT
Wissenschaftlicher Oberrat
Biologische Bundesanstalt für Land-und
orstwirtschaft
Fachgruppe Chemische Mittelprüfung
Messeweg 11/12
D-38104 Braunschweig
Tel.: +49 531 2993503
Fax: +49 531 2993004
E-mail:

Dr Otto KLEIN
Bayer AG, Landwirtschaftszentrum Monheim
Geschäftsbereich Planzenschutz
PF-E/Registierung
D-51368 Leverkusen
Tel.: +49 2173 383463
Fax: +49 2173 383516
E-mail: otto.klein.ok@bayer-ag.de

Dr Henning H. REGENSTEIN
BASF Aktiengesellschaft
Agricultural Center Limburgerhof
APD/RC-Li556
D-67117 Limburgerhof
Germany
Tel.: +49 621 602 7413
Fax: +49 621 602 7604
E-mail: henning.regenstein@basf-ag.de

GHANA

Mr Edmond Kojo Jack-Vesper SUGLO
Director of Plant Protection
Head of Pesticide Management Division
Plant Protection and Regulatory Services Directorate
P.O. Box M 37
Pokoase, Accra
Tel. : +233 21 302638
Fax:
E-mail : **icpacc@ghana.com**

Mrs. Elizabeth ADETOLA
Principal Scientific Officer
Ghana Standards Board
P.O. Box MB 245
Accra
Ghana
Fax: +233 21 500231
E-mail: gsbnep@ghana.com
gsbdir@ghana.com

GREECE/GRÈCE/GRECIA

Dr Chaido LENTZA-RIZOS
Pesticide Residue Specialist
NAGREF, Ministry of Agriculture
Pesticide Residue Laboratory
1, S. Venizelou str.
14123 Lycovrissi,
Athens
Greece
Tel.: +3 01 2819728, 2819019
Fax: +3 01 2818735
E-mail: rizos@internet.gr

GUINEA ECUATORIAL

Mr B. PANADES MENEJAL
Secretario GRBL Ministerio Agricultura
Ministerio de Agricultura
Malbabo Guinea
Ecuatorial
Tel: +0024093464

HUNGARY/ HONGRIE/ HUNGRÍA

Dr Katalin MATYASOVSZKY
Head of the Pesticide Residue Department
National Institute for Food-Hygiene and Nutrition
Gyali ut 3-a
1097 Budapest
Tel.: +36 1 215 4130
Fax: +36 1 215 1545

Dr László GYÖRFI
Head of Chemistry Department
Plant Protection and Soil Conservation Central
Budaörsi út 141-145
H-1118 Budapest
Tel.: +36 1 309 1020
Fax: +36 1 1246 2960 / +36 1 246 2956
E-mail: novved@bendeguz.elender.hu

INDIA

Dr R.B. DOHAREY
Joint Commissioner (S&R)
Ministry of Consumer Affairs, Food &
Public Distribution
Krishi Bhavan,
New Delhi-110001
India
Tel: +011-3383108
Fax: +011-3782213
E-mail: rbdohareydc-s&r@grainsnic.in

Dr C.R. SIVADASAN
Sr. Scientist (Quality Control),
Spices Board,
Sugandha Bhavan
NH Bye pass.
P.O.B. No.2277
Palari vattom
Cochin-682 025
India
Tel:+91484 333610-616
Fax: +91484331429
E-mail: spicesboard@vsnl.com

INDONESIA/INDONESIE

Dr Andriyono Kilat ADHI
Agriculture Councellor
Indonesian Mission to EC
Boulevard de la Woluwe 38
Brussels 1200
Belgium
Tel: +32 2 779 0915
Fax: +32 2 772 8190
E-mail: attani@primebxl.be

Mohammad K.Koba
Third Secretary
Indonesian Mission to EC
Boulevard de la Woluwe 38
Brussels 1200
Belgium
Tel: +32 2 779 0915
Fax: +32 2 772 8210
E-mail: mkkoba@diplomats.com

IRAN

Ms Maryan Katal MOHSENI
Expert in Chemistry
3rd Department of Ministry of Health and medical education
Fakhre razi si Engelab Av.
Tehran
Iran
Tel: + 98-021-6404268
Fax: +98 021 6467265
E-mail: m.katalmohseni@yahoo.com

IRELAND/IRLANDE/IRLANDA

Dr John ACTON
Agricultural Inspector
Pesticide Control Service
Department of Agriculture and Food
Abbotstown
Castleknock
Dublin 15
Tel.: +353 1 607 2614
Fax: +353 1 820 4260
E-mail: **dan.osullivan@daff.irlgov.ie**

ISRAEL

Ms Rina ASHKENAZY
Head of Pesticide Registration Division
Plant Protection and Inspection Services
Ministry of Agriculture
P.O Box 78
Bet-Dagan, 50250
Tel.: +972 3 968 1562
Fax: +972 3 968 1582
E-mail: **rinaa@moag.gov.il**

Mrs Dr Rina VARSANO
Head Food Contaminants Department
Food Control Service
Ministry of Health
12 Haarbaast
Tel Aviv 64739
Tel.: + 972 3 5634834
Fax: + 972 3 5684603
E-mail : fcsrina@matat.health.gov.il

ITALY/ITALIE/ ITALIA

Mr Ciro IMPAGNATIELLO
Ministero delle Politiche Agricole e Forestali
VIA XX Settembre 20
00187 Roma
Tel.: +39 06 46656510-46656511
Fax: +39 06 4880273
E-mail: **blturco@tiscalinet.it**

JAMAICA

Ms Carol THOMAS
Chief Plant Quarantine Officer
Ministry of Agriculture
Hope Gardens, Kingston 6
Jamaica W.I.
Tel. : +876-977-0637
Fax: +876-977-6401
E-mail : cyt@cwjamaica.com

JAPAN/JAPON/JAPON

Mr Yasuhiro ARAKI
Chief,
Standards Division, Department of Food Safety
Pharmaceutical and Food Safety Bureau
Ministry of Health, Labour and Welfare
1-2-2, Kasumigaseki Chioda-ku
Tokyo, 100-8916
Japan
Tel.: +81 3 35952341
Fax: +81 3 35014868
E-mail: araki-yasuhiro@mhlw.go.jp

Dr Yukiko YAMADA
Director for Internation Affairs (Food Research)
National Food Research Institute
2-1-12 Kannondai, Tsukuba 305-8642
Japan
Tel.: +81 298 388017
Fax: +81 298 388005
E-mail: yamadayk@affrc.go.jp

Mr Hirotada NAGAI
Standards Division, Department of Food Safety
Pharmaceutical and Food Safety Bureau
Ministry of Health, Labour and Welfare
1-2-2, Kasumigaseki Chioda-ku
Tokyo, 100-8916
Japan
Tel.: +81 3 35952341
Fax: +81 3 35014868
E-mail: nagai-hirotada@mhlw.go.jp

Mr Kazuo OGURA
Deputy Director
Agricultural Chemicals
Administration Office, Agricultural Production bureau
Ministry of Agriculture, Forestry and Fisheries
Kasumigaseki 1-2-1, Chioda-ku
Tokyo, 100-8950
Japan
Tel.: +81 3 35028111 ext. 3792
Fax: +81 3 35025302
E-mail: kazuo_ogurra@nm.maff.go.jp

Mr Masaya NAKAMURA
Chief
Pesticide Residue Inspection Division
Agricultural Chemicals Inspection Station
Suzuki-cho 2-772, Kodaira-shi
Tokyo, 187-0011
Japan
Tel.: +81 42 3832151
Fax: +81 42 3853361
E-mail: n-masaya@acis.go.jp

Mr Koichi HIRUTA
Deputy Director
Agricultural Chemicals Control Office
Water Environment Department
Ministry of Environment
Kasumigaseki 1-2-2
Chiyoda-ku
Tokyo
Japan
Tel.: +81 3 55218311
Fax: +81 3 35045350
E-mail: koichi_hiruta@env.go.jp

Dr Yashuhiro KATO
Technical Adviser
The Institute of Environmental Toxicology
4321 Uchimoriya-cho, Mitsukaido-shi
Ibaraki 303-0043
Japan
Tel.: +81 297 27 4510
Fax: +81 297 27 4517
E-mail: katoh@iet.or.jp

REPUBLIC OF KOREA/COREE, REPUBLIQUE DE COREA, REPÚBLICA DE

Dr In-Gyun HWANG, Ph.D
Pesticide Residues Division
Food Evaluation Department
Korea Food & Drug Administration
#5 Nokbun-Dong
Eunpyung-gu
Seoul 122-704
Korea
Tel.: +82 2380 1674/5
Fax: +82 2382 4892
E-mail: ighwang@kfda.go.kr

Mr. Byeong-Hwan LEE
Deputy Director
Agricultural Machinery & Material Division
1, Joongang-Dong, Kwachunn-City
Kyunggi-Do, 427-719
Korea
Tel.: +82 2 2110 4302
Fax: +82 2 503 7276
E-mail: leebh@maf.go.kr

Jea-Chul CHANG
Director Products Planning Team
Kyung Nong Corporation
20th Fl, Mijin Plaza B/D 825
Yoksam-Dong, Kangnam-Gu
Seoul, Korea
Tel: +82 2 3469 1345
Fax: +82 2 3469 1337 9
E-mail: jcjang@knco.co.kr

Mr J.C. CHANG
Director
Products Planning Team
Kyung Nong Corporation
20th. Fl. Mijin Plaza B/D 825
Yoksam-Dong, Kangnam-Gu
Seoul
Korea
Tel: +82 2 3469 1345
Fax: +82 2 3469 1337-9
E-mail: jcjang@knco.co.kr

Mr Jeong-Hyun KWON
A.Manager
Dong Bu Hannong Chemical
19F, Dongbu Financial Centre #89-10
Daechi-Dong, Kangnam-Gu
Seoul
Korea
Tel: +82 2 3484 1775
Fax: +82 2 565 8534
E-mail: atrimaster@dongbuchem.com

Mr Kun-Sang PARK
Senior Researcher
Division of Pesticide Residues
Department of Food Evaluation
Korea Food & Drug Administration
#5 Nokbun-Dong
Eunpyung-Ku
Seoul 122-704
Tel.: +82 2380 1674
Fax: +82 2382 4892
E-mail: **parkk0@kfda.go.kr**

Mrs Jun-Kyung PARK
Senior Researcher
Food Sanitation Council
Ministry of Health and Welfare
Codex Office
Korea Food & Drug Administration
#5 Nokbun-Dong
Eunpyung-Gu
Seoul 122-704
Tel.: +82 2380 1558/9
Fax: +82 2380 8321
E-mail: codexkorea@kfda.go.kr

Dr Yang-Bin IHM
Agricultural Researcher
National Institude of Agricultural Science and Technology, RDA
249 Seodundong Suwon
Tel.: +82 31 290 0504
Fax: +82 31 290 0521
E-mail: ybihm@rda.go.kr

Young Pyo LEE
838 Yaek Sam-Dong Kangnam-Gu
Seaul, 135-0/0 Korea
Dongbuhannong Chemical Co., Ltd

Yang Ho JUNG
825 Yaek Sam-Dong Kangnam-Gu
Seaul, 135-93K Korea
Cop Box 649 Kyung Nong Co.Ltd.
Bang Sik LEE
732-6, Dongcheonni, Chinwimyun, Pyongtaek-si
Kyunggi-do, Korea, 471-864
Misung co. Physicochemical Team
Tel: + 031 610-7792
Fax: + 031 611 8802

Mr Kee-sung Kyung, Ph.D
Research Scientist/Ecotoxicology Lab.
Dept. of Pesticide Safety
National Institute of Agricultural Science & technology
Rural Development Administration
249, Seodun-Dong
Suwon 441-707
Korea
Tel: + 82 31 2900504
Fax: + 82 31 2900521
E-mail: kskyung@rda.go.kr

Mr Lee Byeong HWAM
Deputy Director
Toongang-Dong, Kwachunn-City
Kyunggi-Do
Korea
Tel: + 82 2 2110-4302/3
E-mail: leebh@maf.go.kr

KUWAIT/KOWEIT

Dr. Ali BU-ABAAS
Head of Food Chemistry Unit
Ministry of Public Health
P.O. Box 5540
Safat, 13056
Kuwait
Tel.: +965 2435379
E-mail: buabbasa@macktoob.com

MALAYSIA/MALAISIE/ MALASIA

Ms Shamsiah MUHAMAD
Director Pesticide Control Division
Department of Agriculture
Jalan Gallagher
50480 Kuala Lumpur
Malaysia
Tel : +603-2697 7220
Fax : +603-2697 7225
E-mail: pkrp@pop.moa.my

Dr Cheah Uan BOH
Senior Research Officer
Strategic, Environment & Natural Resources Research Centre
Malaysian Agricultural Research Development Institute (MARDI)
PO Box 12301
50774 Kuala Lumpur
Tel.: +6 03 89437672
Fax: +6 03 89487639
E-mail: ubcheah@mardi.my

Mr Mohammad JAAFFAR
Regional Manager, Europe
Malaysian Palm Oil Board
Brickendonbury, Herford SG13 8NL
United Kingdom
Tel.: +44 1992 554347
Fax: +44 1992 500564
E-mail: mpob@mpob.powernet.co.uk

MOROCCO/MAROC/MARRUECOS

Mr Lahoussaine SAAD
Chef du Service Technique à la Division
de la Répression des Fraudes
Ministère de L'Agriculture, du Développement
Rural et des Eaux et Forêt
DPVCTRF Station Dbagh
Avenue Hassan II Rabat
Morocco
Tel.: +212 7 297546
Fax: +212 7 298150

Mr Sâd CHERQAOUI
Service de la Protection des Végétoux
Ministere de L'Agriculture, du Développement
Rural et des Eaux et Forêt
DPVCTRF Station Dbagh
Avenue Hassan II Rabat – B.P. 1308
Morocco
Tel.: +212 7 297546
Fax: +212 7 298150

Mr Ahmed ZOUAOUI
Chef desection des Résidue de Pesticides
Laboratoire Officiel d'Analyses et de Recherches chimiques
Rue Nichakra Rahal nr.25
Casablanca
Morocco
Tel.: +212 7 297546
Fax: +212 7 298150

Mr Mohamed BENZINE
Chef de la Division Laboratoire Produits
Etablissement Autonome de contrôle
Et de Coordination des Exportations.
72, Rue Mohamed Smiha
Casablanca
Morocco
Tel: +212 2 31 44 80 / 30 51 04
Fax: +212 2 30 25 67 / 30 51 68
E-mail : mbenzine@yahoo.com

MOZAMBIQUE

Mr Khaid CASSAM
Chief of Pesticide Control and Regulation Service
Plant Production Department
National Directorate of Agriculture
Ministry of Agriculture and Rural Development

NETHERLANDS/PAYS-BAS/PAISES BAJOS

Dr Ir. Henry DE HEER
International Phytopharmaceutical Coordinator
Ministry of Agriculture, Nature Management
and Fisheries
Department of Agriculture
P.O. Box 20401
2500 EK Den Haag
Tel.: +31 70 378 5685
Fax: +31 70 348 6156
E-mail: h.de.heer@dl.agro.nl

Dr David G. KLOET
Residue Adviser
RIKILT (Wageningen UR)
P.O. Box 230
6700 AE Wageningen
Tel.: +31 317 475 562
Fax: +31 317 417 717
E-mail: d.kloet@rikilt.wag-ur.nl

Dr Bernadette OSSENDORP
National Institute of Public
Health and the Environment
P.O. Box 1
3720 BA Bilthoven
Tel.: +31 30 274 3970
Fax: +31 30 274 4401
E-mail: bernadette.ossendorp@rivm.nl

Dr Hans JEURING
Inspectorate for Health Protection and Veterinairy
Public Health
Ministry of Health, Welfare and Sport
PO Box 16108
2500 BC Den Haag
Tel.:+31 70 340 5585
Fax:+31 70 340 5435
E-mail: hans.jeuring@kvw.nl

Dr Gijs KLETER
Senior Veterinary
Public Health Officer
Ministry of Health, Welfare and Sport
PO Box 16108
2500 BC THE HAGUE
Tel.: +31 70 3406933
Fax: +31 70 3405435
E-mail : gijs.kleter@kvw.nl

Mrs Ir. Erica MULLER
Consultant Phytopharmacy,
Ministry of Agriculture, Nature
Management and Fisheries
Plant Protection Service
P.O. Box 9102
6700 HC Wageningen
Tel.: +31 317 496 881
Fax: +31 317 421 701
E-mail: e.muller@pd.agro.nl

Dr Piet VAN ZOONEN
Head of Laboratory
National Institute of Public Health
nd the Environment
P.O. Box 1
3720 BA Bilthoven
Tel.: +31 30 274 2876
Fax: +31 30 274 4424
e-mail: piet.van.zoonen@rivm.nl

Mrs ir Monique MELLEMA
Product Board for Horticulture
P.O. Box 280
2700 AG Zoetermeer
Tel.: +31 79 347 0707
Fax: +31 79 347 0404
E-mail: m.mellema@tuinbouw.nl

Dr. Lindy MESSCHENDORP
CTB Board for the authorisation of pesticides
P.O.Box 217
6700 AE WAGENINGEN
Tel: +31 317 471833
Fax: +31 317 471899
E-mail: l.messchendorp@ctb.agro.nl

Dr Jan Hendrik KROOK
CTB Board for the Authorisation of pesticides
P.O.Box 217
6700 AE WAGENINGEN
Tel:+31 317471870
Fax: +31 317471899
E-mail: j.h.krook@ctb.agro.nl

NEW ZEALAND/NOUVELLE-ZELANDE
NUEVA ZELANDIA

Mr David W. LUNN
National Manager (Plant Residues)
MAF Food Assurance Authority
P.O.BOX 2526
Wellington
Tel.: +64 4 474 4210
Fax: +64 4 474 4240
E-mail: Lunnd@maf.govt.nz

Dr William JOLLY
Counsellor (Veterinary & Technical), European Region
New Zealand Mission to the EU
1 Square de Meeus
B-1000 Brussels
Belgium
Tel. : +32 2 5501219
Fax: +32 2 5134856
E-mail : jollyb@maf.gov.nz

NIGERIA

Mr. M.O. OLADUNMADE
Deputy Director
Pestcontrol Services
Area 11
P.M.B 135
Garki
Abuja
Tel: + 09 3142747
Fax: + 09 3140347
E-mail: prs@microaccess.com

NORWAY/NORVÈGE/ NORUEGA

Ms Kirstin FÆRDEN
Head of Section
Section for Food Additives and Contaminants
Department for Food Additives, Contaminants,
Food Labelling and Quality
Norwegian Food Control Authority
P.O. Box 8187 Dep
N-0034 Oslo
Norway
Tel.: +47 23217000
Fax: +47 23217001
E-mail: kif@snt.no

Ms Cécile BLOM
Higher Executive Officer
Section for Food Additives and Contaminants
Department for Food Additives, Contaminants,
Food Labelling and Quality
Norwegian Food Control Authority
P.O. Box 8187 Dep
N-0034 Oslo
Norway
Tel.: +47 23217000
Fax: +47 23217001
E-mail: cbl@snt.no

Mr Børge HOLEN
Laboratory Manager
Norwegian Crop Research Institute
Pesticide Laboratory
Oslovn.1
N-1430 ÅS
Tel.: +47 64 949569
Fax: +47 64 95 9579
E-mail: børge.holen@planteforsk.no

Ms Merete DÆHLI
Higher Executive Officer
Norwegian Agricultural Inspection Service
PO Box 3
N-1431 ÅS
Tel.: +47 64944345
Fax: +47 64944410
E-mail: merete.dahli@landbrukstilsynet.dep.no

PHILIPPINES

Mrs Paz AUSTRIA
Chief National Pesticide Analytical Laboratory
Bureau of Plant Industrie
Visayas Avenue
Diliman, Quezon City
1100 Quezon City
Philippines
Tel.: + (632) 4251365
Fax: +(632)4251366
E-mail: bpinpal@edsamail.com.ph

POLAND/POLOGNE/POLONIA

Mr Slawomir PIETRZAK
Deputy Director
Agricultural and Food Quality Inspection
30 Wispólna Street
00-930 Warsaw
Poland
Tel.: +4822 628 73 93
Fax: +48226214858
E-mail: spietrzak@cis.gov.pl

Ms Katarzyna GÓRALCZYK, Ph.D.
Head of Laboratory
National Institute of Hygiene
Chocimska str. 24
00-791 Warsaw
Tel.: +48 22 849 3332
Fax: +48 22 849 7441
E-mail: kgoralczyk@pzh.gov.pl

Ms Katarzyna MAZUR
Head of Laboratory
Agricultural and Food Quality Inspection
8/12 Pilsudskiego Street, 81-378 Gdynia
Poland
Tel.: +48586616730
Fax: +48586616814
E-mail: labcis@mega.com.pl

Ms Anna NOWACKA
Institute of Plant Protection
Head of Department of Pesticide Residue Research
Miczurina str. 20
60-824 Poznan
Tel.: +48 61 86 49054
Fax: +48 61 86 76301
E-mail: a.nowacka@ior.poznan.pl

SENEGAL

Mr Alhousseynou Moctar HANNE
Chef du Bureau Contrôle Phytosanitaire
et Qualité de la Direction de la Protection des
égétaux
Senegal
Tel. : +221 6407517 (P) +221 8340397 (B)
Fax: +221 8342854
E-mail : maedpv@primature.sn

SLOVAK REPUBLIC/RÉPUBLIQUE SLOVAQUE REPÚBLICA ESLOVACA

Dr Jana KOVACICOVÁ, Ph.D.
Head of Quality department
Institute of Preventive and Clinical Medicine
Limbová 14
833 01 Bratislava
Tel.: +421 7 593 69343
Fax: +421 7 547 73906
E-mail: **kovacic@upkm.sk**

SOUTH AFRICA/AFRIQUE DU SUD/SUDÁFRICA

Mrs A. CASEY
Assistant Director
Directorate Food Control
Dept. of Health
Private Bag X828
Pretoria 0001
Tel.: +27 12 312 0155
Fax: +27 12 326 4374
E-mail: **caseya@health.gov.za**

SPAIN/ESPAGNE/ESPAÑA

Dr Santiago GUTIERREZ DEL ARROYO
Tecnico Superior de la Subdireccion General
de Securidad Alimentaria
D.G. Salud Pública
Ministerio de Sanidad y Consumo
Paseo del Prado 18-20
28014 Madrid
Tel.: +34 91 596 1996
Fax: +34 91 596 4487
E-mail: **sgutierrez@msc.es**

Dr Fernando VÁRES MEGINO
Jefe de Sección de Inspeccion
Sud. Gral. De Medios de Producción Agricolas. DGA
M° de Agricultura, Pesca Y Alimentation
P° Infanta Isabel, 1
28071-Madrid
Spain

Dr Enrique CELMA
Director De Asuntos Publicos Y Reglamentarios
Syngenta Agro, S.A.
Costa Brava 13 3.a Planta
Madrid
Spain
Tel.: +34 91 3876410
Fax: +34 91 7350180
E-mail: enrique.celma@syngenta.com

Dr Josefina LOMBARDERO VEGA
Jefa del Departemento de Residuos del Laboratorio arbitral
Agroalimentario D.G. de Alimentación
Ministerio de Agricultura, Pesca y Alimentacion
Crta. De la Coruña KM 10,700
28023 Madrid
Tel.: +34 91 34 74978
Fax: +34 91 34 74968
E-mail: josefina.lombardero@mapya.es

SUDAN/SOUDAN

Prof Khalid EL ABBADI
Sudanese Standard and Metrology Organization (SSMO)
Consultant SSMO
PO Box 13573 Khartoum
Sudan
Tel:
Fax: 00 249 11 774852
E-mail:

SWEDEN/SUÈDE/ SUECIA

Mrs Ingegärd BERGMAN
Principal Administrative Officer
National Food Administration
P.O. Box 622
SE -751 26 Uppsala
Tel.: +46 18 175500
Fax: +46 18 105848
E-mail: livsmedelsverket@slv.se

Mr Arne ANDERSSON
Chief Government Inspector
National Food Administration
P.O. Box 622
SE-751 26 Uppsala
Tel.: +46 18 175500
Fax: +46 18 105848
E-mail: livsmedelsverket@slv.se

SWITZERLAND/SUISSE/SUIZA

Dr Claude WÜTHRICH
Head of Section
Federal Office of Public Health,
Division of Food Science
Schwarzenburgstrasse 165
CH-3003 Bern
Tel.: +41 31 322 95 69
Fax: +41 31 322 95 74
E-mail: **claude.wuethrich@bag.admin.ch**

Dr Werner KOBEL
Swiss Society of Chemical Industry
c/o Syngenta Crop Protection AG
R1058-7.48
Postfach
CH-4002 Basel
Tel.: +41 61 323 6239
Fax: +41 61 323 5334
E-mail: werner.kobel@syngenta.com

Dr Richard STADLER
Nestec ltd
Vers-chez-les-Blanc
1000 Lausanne 26
Tel.: +41 21 785 8360
Fax: +41 21 785 8553
E-mail: richard.stadler@rdls.nestle.com

THAILAND/THAILANDE/TAILANDIA

Dr Nuansri TAYAPUTCH
Director
Division of Agricultural Toxic Substances
Department of Agriculture
Bangkok 10900
Thailand
Tel.: +66 2 5793 579, 66 2 9405390
Fax: +66 2 5614 695
E-mail: nuantaya@doa.go.th

Ms Orawan ANANVORANICH, Ph.D
Counsellor
Office of Commercial Affairs
Royal Thai Embassy
Avenue Franklin D Roosevelt 188
1050 Brussels
Belgium
Tel.: +32 2 673 0060
Fax: +32 2 673 4425
E-mail: thaibe@pophost.eunet.be
Orawan200@yahoo.com

Ms Orapin THIRAWAT
Director of Plant Protection Service Division
Department of Agriculture Extension
Plant Protection Service Division
Ministry of Agriculture and Cooperatives
Tel.: +02-579-3008
Fax: +02-579-3831
E-mail: plantpro@doae.go.th

Mr Pisan PONGSAPITCH
Standards Officer
Officer of the National Codex Alimentarius Committee
Thai Industrial Standards Institute
Rama VI Road Ratchathewi
Bangkok 10400
Tel.: +66 2 2023 348
Fax: +66 2 2487 987
E-mail: pisanp@tisi.go.th

Mrs Malinee SUBVANICH
Director & General Secretary
Thai Food Processors'Association
170/22 9th Floor Ocean Tower 1 Bldg,
New Ratchadapisek Rd.
Klongtoey
Bangkok 10110 Thailand
Tel.: +662 2612684-6, 261-2995
Fax: +261-2996-7
E-mail: thaifood@thaifood.org

Ms Yaninee SANGYOKA
Technical Officer
Thai Food Processors' Association
170/21-22 9th Floor, Ocean Tower 1 Bldg.
New Ratchadapisek Rd. Klongtoey
Bankok 10110 Thailand
Tel. : + 662 2612684-6
Fax: + 662 2612996-7
E-mail : technical@thaifood-org

UNITED ARAB EMIRATES/EMIRATS ARABES UNIS/EMIRATOS ARABES UNIDOS

Mr Eng. Rashed Saleh AL-MEHREZI
Director
Ministry of Agriculture & Fisheries
Central Laboratories-Al Ain
P.O. Box: 16054- Al Ain
United Arab Emirates
Tel: +971-3-7832255
Fax: +971-3-7832075
E-mail: mehrez30@hotmail.com

UNITED KINGDOM/ ROYAUME-UNI REINO UNIDO

Mr D. GRIFFIN
Department for Environment, Food and Rural Affairs
Pesticide Safety Directorate
Mallard House
Kings Pool
3 Peasholme Green
York. YO1 7 PX
Tel.: +44 1904 455 788
Fax: +44 1904 455 733
E-mail: donal.griffin@psd.maff.gsi.gov.uk

Mr A.R.C. HILL
Ministry of Agriculture, Fisheries and Food
Central Science Laboratory,
Sand Hutton
York. YO4 1LZ
Tel.: +44 1904 462 469
Fax: +44 1904 462 111
e-mail: alan.hill@csl.gov.uk

Mr S. REYNOLDS
Department for Environment, Food and Rural Affairs
Central Science Laboratory
Sand Hutton
York YO4 1LZ

Dr J. NORMAN
Food Standards Agency
Aviation House
Kingsway
London WC2B 6NH
England
Tel.: +44 207 276 8506
E-mail: Julie.Norman@foodstandards.gov.uk

Mr G. TELLING
Food and Drink Federation
Green End Farmhouse
PertenHall
Beds. MK44 2AX
Tel.: +44 1480 860 439
Fax: +44 1480 861 739
E-mail: gefh@ukgateway.net

Mr J.R. COX
Natural Resources Institute
Central Avenue
Chatham Maritime
Kent ME4 4TB
Tel.: +44 1634 883 896
Fax: +44 1634 883 379
e-mail: john.cox@nri.org

UNITED STATES OF AMERICA
ETATS-UNIS D'AMÉRIQUE
ESTADOS UNIDOS DE AMÉRICA

Mr Edward ZAGER
Associate Director
Health Effects Division (7509C)
Office of Pesticide Programs
U. S. Environmental Protection Agency
Ariel Rios Building
1200 Pennsylvania Avenue, N.W.
Washington, DC 20460
Tel.: +1 703 305-5035
Fax: +1 703 305-5147
E-mail: Zager.Ed@epa.gov

Dr Robert L. EPSTEIN
Deputy Administrator, Science and Technology
Agriculture Marketing Service
U.S. Department of Agriculture
P. O. Box 96456 Room 3507S, Mail Stop 0222
14th & Independence Avenue
Washington, DC 20090
Tel.: +1 202 720-5231
Fax: +1 202 720-6496
E-mail: Robert.Epstein@USDA.GOV

Mr Charles W. COOPER
Director, International Activities Staff (HFS-585)
Center for Food Safety and Applied Nutrition
Food and Drug Administration
Center for Food Safety and Applied Nutririon
Office of Constituent Operations
5100 Paint Branch Parkway
Room 1B-068
College Park, MD 20740
Tel.: +1 301 4361714
Fax: +1 301 4362618
E-mail: CharlesCooper@cfsan.fda.gov

Mrs Dr Cynthia DEYRUP
Office of Public Health and Science
Food Safety and Inspection Service
U.S. Departement of Agriculture
1400 Independence Avenue, SW
Room 344 Aerospace Building
Washington, DC 20250
Tel. : +202 6901081
Fax: +202 6906565
E-mail : cindy.deyrup@usda.gov

Mr David EGELHOFER
International Trade Specialist
U.S. Departement of Agriculture
Foreign Agriculture Service
United States Department of Agriculture
1400 Independence Avenue, S.W.
Mail Stop - 1027
Washington, DC 20250
Tel.: +1 202 690-4898
Fax: +1 202 690-0677
E-mail: EgelhoferD@fas.usda.gov

Dr Stephen FUNK
Health Effects Division (7509C)
Office of Pesticide Programs
U. S. Environmental Protection Agency
Ariel Rios Building
1200 Pennsylvania Avenue, N.W.
Washington, DC 20460
Tel.: +1 703 305-5430
Fax: +1 703 305-5147
E-mail: funk.steve@epa.gov

Ms Ellen MATTEN
U. S. Codex Office
US Department of Agriculture
Room 4861 South Building
1400 Independence Ave. S.W.
Washington, DC 20250-3700
Tel.: +1 202 720-4063
Fax: +1 202 720-3157
E-mail: ellen.matten@usda.gov

Mr Charles H. PARFITT
Senior Scientific Coordinator
Division of Field Science (HFC-141)
Office of Regulatory Affairs
Food and Drug Administration
5600 Fishers Lane
Rockville MD 20857
Tel.: +1 301 827-1033
Fax: +1 301 443-6388
E-mail: cparfitt@ora.fda.gov

Dr Whang PHANG
Health Effects Division (7509C)
Office of Pesticide Programs
U. S. Environmental Protection Agency
Ariel Rios Building
1200 Pennsylvania Avenue, N.W.
Washington, DC 20460
Tel.: +1 703 308-2723
Fax: +1 703 305-5147
E-mail: phang.whang@epamail.epa.gov

Mrs Dr Nancy N. RAGSDALE
USDA-ARS National Program Staff
National Program Leader
Pest Management Chemistry
George Washington Carver Center
5601 Sunnyside Avenue
Room 4-2108
Beltsville, MD 20705-5140
Tel. : +301 504 4509
Fax: +301 504 6231
E-mail : NNR@ARS.USDA.GOV

Dr Hugh W. (Wally) EWART, PH.D
Vice President for Scientific Affairs
Northwest Horticultural Council
6 So. 2nd St.
Room 600
Yakima, WA 98901
Tel.: +1 509 453-3193
Fax: +1 509 457-7615
E-mail: ewart@nwhort.org

Ms Jean-Mari PELTIER
Counselor to the Administrator
U.S. Environmental Protection Agency
Ariel Rios Building
1200 Pennsylvania Avenue, NW
Room 1101A
Washington, DC 20460
Tel.: +202 5647960
Fax: +202 5011477
E-mail: peltier.jean-mari@epa.gov

Dr Stephen WRATTEN
Representing CropLife America
Manager of Registrations
Monsanto Company
800 North Lindbergh Boulevard
St. Louis, MO 63167
Tel.: +1 314 694-1582
Fax: +1 314 694-4028
E-mail: stephen.j.wratten@monsanto.com

Ms Cecilia P. GASTON
Technical Director
International Regulatory Policies & Practices
Novigen Sciences Inc.
1730 Rhode Island Ave, N.W.
Suite 1100 Washington, D.C. 20036
USA
Tel.: +1 202 293-5374
Fax: +1 202 293-5377
e-mail: cgaston@novigenci.com

Mr Charles ORMAN
California Citrus Quality Council
210 Magnolia Avenue
Suite 3
Auburn, CA 95603
Tel.: +530 8851894
Fax: +530 8851546
E-mail: corman@sunkistgrowers.com

Bill BRYANT
Chairman
Bryant Christie, Inc.
1425 Fourth Avenue, Suite 808
Seattle, WA 98101
Tel.: +206 2926340
Fax: +206 2926341
E-mail: billb@bryantchrisitie.com

Hugh W. (Wally) EWART
President
California Citrus Quality Council
210 Magnolia Avenue
Suite 3
Auburn, CA 95603
Tel.: +530 8851894
Fax: +530 8851546
E-mail: ccqc@pacbell.net

Dr James L. KUNSTMAN
Product Manager
Bayer Corporation
8400 Hawthorn Road
Kansas City, MO 64120
USA
Tel.: + 1 816 242 2838
Fax: + 1 816 242 2738
E-mail: jim.kunstman.b@bayer.com

INTERNATIONAL GOVERNMENTAL ORGANIZATIONS
ORGANIZATIONS GOUVERNMENTALES INTERNATIONALES
ORGANIZACIONES GUBERNAMENTALES INTERNACIONALES

COUNCIL OF THE EUROPEAN UNION

Mr Olli MATTILA
Administrator
Council of the European Union
Rue de la Loi 175
B-1048 Brussels
Belgium
Tel.: +32 2 285 8357
Fax:+32 2 285 7928
E-mail: olli.mattila@consiliumeu.int

EUROPEAN COMMUNITY (EC)
COMMUNAUTE EUROPEENNE
COMUNIDAD EUROPEA

Dr Canice NOLAN
Principal Administrator
European Commission
Directorate-General Health and Consumer Protection
200 Rue de la Loi
B-1049 Brussels
Belgium
Tel.: +32 2 29 61633
Fax: +32 2 29 65963
E-mail: **canice.nolan@cec.eu.int**

Dr B. DRUKKER
Europese Commissie
Directorate General Health and Consumer Protection
Rue de la Loi 200
B-1049 Brussels
Belgium
Tel.: +32 2 2965779
Fax: +32 2 2965963
E-mail: bas.drukker@cec.eu.int

Mr Luis Martin PLAZA
Health and Consumer Protection Directorate-General
European Commission
200 Rue de la Loi
B-1049 Brussels
Belgium
Tel.: +32 2 2993736
Fax: +32 2 29 65963
E-mail: **luis.martin—plaza@cec.eu.int**

INTERNATIONAL TRADE CENTR (ITC UNCTAD/WTO)

Mr Antony SANDANA
Senior Commodity Officer
International Trade Centre, ITC UNCTAD/WTO
54,56, Rue Montbrillant
1211 Geneva
Switzerland
E-mail: sandana@intracen.org

Mr Roger CLARK
ITC Advisor on Spices
International Trade Centre, ITC UNCTAD/WTO
54,56, Rue Montbrillant
1211 Geneva
Switzerland
E-mail: sandana@intracen.org

ORGANISATION FOR ECONOMIC CO-OPERATION AND DEVELOPMENT (OECD)

Mrs Libby HARRISON
Principal Administrator
Organisation for Economic Co-operation and evelopment (OECD)
Environment Directorate
Environment , Health and Safety Division (EHS)
2, Rue Andre –Pascal
75775 Paris Cedex 16
Tel. : +33 (0)1 45241676
Fax: +33 (0)1 45241675
E-mail : libby.Harrison@oecd.org

ORGANISATION INTERNATIONALE DE LA VIGNE ET DU VIN (OIV)

Dr. Dominique A.P. TUSSEAU
Organisation Internationale de la Vigne et du Vin
C/O CIVC
5 Rue H Martin-BP 135
51204 Epernay Cedex
France
Tel.: +33 3 26 511930
Fax: + 33 3 26 511957
E-mail: dominique.tusseau@civc.fr

INTERNATIONAL NON-GOVERNMENTAL ORGANIZATIONS

CONSUMERS INTERNATIONAL (CI)

Ms Lisa Y. LEFFERTS
Consultant
Consumers Union
526 Mountain Field Trail
Nellysford, VA 22958
USA
Tel.: +1 434 361 2420
Fax: +1 434 361 2421
e-mail: llefferts@earthlink.net

Mrs Beate KETTLITZ
BEUC
Avenue de Tervuuren 36
1040 Brussels
Belgium
Tel.: +32 2 7431590
E-mail: bke@beuc.org

Mr Robert REMY
Test Achats
Rue de Hollande 13
1060 Brussels
Belgium
E-mail: rremy@test-achats.be

CROPLIFE INTERNATIONAL (CLI)

MrsHelena Robin BORDIE
Manager, International Regulatory Affairs
Avenue Louise 143
B-1050 Brussel
Belgium
Tel. : +32 25420410
Fax: +32 25420419
E-mail: robin@croplife.org

Dr Desmond BYRNE
Director, Registrations & Registry Affrs.
Arvesta Inc.
100 first Street
San Francisco, CA 94105
USA
Tel.: +1 415 536 3465
Fax: +1 415 284 9884
E-mail: dbyrne@arvesta.com

Mr Yutaka EBISAWA
Assistant Manager, Registration and Safety
ssessment
Development Dept. Agro Company
Takeda Chemical Industries, Ltd.
13-10, Nihonbashi 2-chome,
chuo-ku, Tokyo 103-8668, Japan
Tel.: +81 3 32782568
Fax: +81 3 32782750
E-mail: Ebisawa_Yutaka@takeda.co.jp

Mr Yoshiyuki EGUCHI
Manager, Regulatoty Affairs
Nippon Soda Co., Ltd.2-2-1 Ohtemachi
Chiyoda-Ku, Tokyo 100-8165
Japan
Tel.: + 81 3 3245 6042
Fax: + 81 3 3245 6289
E-mail: y.eguchi@nippon-soda.co.jp

Mr Alain GARNIER
Plant and Maeterial Protection Div
Janssen Pharmaceutica N.V.
B-2340-Beerse Belgium
Tel.: +32 14 602145
Fax: + 32 14 605951
E-mail: agarmiez@janbe.jmj.com

Ms Evelyne GÜSKEN
Manager, Food Safety & Quality- European Parliament
Relations
European Crop Protection Association
6 Avenue E von Nieuwenhuyse
1160 Brussels
Belgium
Tel. : + 32 2 663 1557
Fax: + 32 2 663 1560
E-mail : evelyne.gusken@ecpa.be

Dr L.W. HERSHBERGER
Global Product Registration Manager
DuPont Crop Protection
Stine-Haskell Research Center
PO Box 30
Newark, Delaware USA 19714-0030
Tel.: +1 302 366 6308
Fax: +1 302 366 6412
E-mail: leon.w.hershberger@usa.dupont.com

Dr Bruce JULIN
Du Pont (Belgium)
A. Spinoystraat 6
B-2800 Mechelen
BELGIUM
Tel. : +32 (0)15 288742
Fax: +32 (0)15 288746
E-mail : bruce.g.julin-1@usa.dupont.com

Dr M. KAETHNER
Dietary Safety Assessment
Syngenta Crop Protection
R 1058.8.00
CH-4002 Basel
Switzerland
Tel.: +41 61 32 32849
Fax: +41 61 32 34966
E-mail: michael.kaethner@syngenta.com

Dr Gerhard KEUCK
R&D Documentation
Aventis Crop Science
D-65926 Frankfurt/Main
Germany
Tel.: +49 69 305 3785
Fax: +49 69 305 17290
E-mail: Gerhard.keuck@aventis.com

Mr J.L. KLEINHANS
Director, Development & Regulatory/Europe
Tomen France S.A.
18, Avenue de l'Opéra
75001 Paris
France
Tel.: + 33 1 4296 5008
Fax: + 33 1 4297 5291
E-mail: kleinhans@par.tomen.co.uk

Mr Steve L. KOZLEN
Regulatory Affairs Manager Europe
Makhteshim Agan ICC
283 Avenue Louise
1050 Brussels
Belgium
Tel.: + 32 3 646 8606
Fax: + 32 2 646 9152
E-mail: steve.kozlen@maice.be

Mr Per Kristensen
DCPA
Tel.: +45 33244266
Fax: +45 33258416
E-mail: plc@plantevaern.dk

Mr Takashi KUMAGAI
Sumitomo Chemical Co., Ltd
Tel.: +81 3 5543 5692
Fax: +81 3 5543 5695
E-mail: kumagait1@sc.sumitomo-chem.co.jp

Dr Patricia KWIATKOWSKI
Aventis Crop Science
Global Regulatory Affairs Manager
14/20 Rue Pierre Baizet
Lyon Cedex 09
France
Tel.:+33 4 7285 3116
Fax:+ 33 4 7285 3084
E-mail: pat.kwiatkowski@aventis.com

Dr Scott MOBLEY
Arvesta Corporation
100 First Street; Suite 1700
San Francisco
California 94105
USA
Tel.: +415 536 3476
Fax: + 415 284 9884
E-mail: smobley@arvesta.com

Mr Toshikazu MIYAKAWA
JCPA, General Manager
Nihonbashi Club Bldg.
5-8-1 Muromach; Nihonbashi, Chuo-ru
Tokyo, Japan
Tel.:+ 81 3 3241 0230
Fax:+ 81 3 3241 3149
E-mail: miyakawa@jcpa.or.jp

Dr Richard NIELSSON
Consultant
Crop Life International
C/o 326 Woodside Avenue
Trenton, New Jersey 08610-USA
Tel: +1 609 888 3962
E-mail: RJNielsson@aol.com

Mr Masaru NOKATA
General Manager
Regulatory Affairs Dept.
Development Division
Nihon Nohyaku Co., LTD.
5th Floor Eitaro BLDG.
1-2-5, Nihonbashi, Chuo-Ku
Tokyo 103-8236
Japan
Tel.: + 03 3274 3383
Fax: + 03 3281 5462
E-mail: nokata-mesaru@nichino.co.jp

Dr Yuko OKAMOTO
Manager, Registration & Environmental Safety, A&N Div.
DuPont K.K.
8-1, Shimomeguro 1-Chome
Meguro-Ku, Tokyo 153-0064
Japan
Tel.: + 81 3 5434 6119
Fax: + 81 3 5434 6187
E-mail: yuko.okamoto@jpn.dupont.com

Mr David J. OSBORN
Senior Registration Specialist
Crompton Europe Limited
Kennet House
4 Langley Quay
Slough Berkshire SL3 6EH UK
Tel.: +44 1753 603056
Fax : +44 1753 603077
E-mail: david.osborn@cromptoncorp.com

Mr Herbert SCHILT
European Development Manager
Sumitomo Chemical Agro Europe S.A.
Parc d'Affaires de Crécy
2, rue Claude Chappe
69370 Saint Didier Au Mont D'OR
France
Tel: +33 0 4 7864 32 09
Fax: +33 0 4 78 47 70 05
E-mail: Herbert@lyon.sumitomo-chem.de

Mr John STREET
Syngenta Crop Protection AG
Basel
Switzerland
Tel.: +44 61 3236081
Fax : +44 61 3237166
E-mail: john.street@syngenta.com

Mr Makoto SAKAKIBARA
Manager, Regulatory Affairs Group, Research Div.
SDS Biotech K.K.
2-5-6 Shiba, Minato-ku
Tokyo 105 – 0014
Tel.: +81 3 5427 2417
Fax: +81 3 5427 2430
E-mail: Makoto_Sakakibara@sdk.co.jp

Mr Toshio SHIMOMURA
Superviser, Pesticide R&D
National Federation of Agricultural
Cooperative Associations
1-8-3, Otemachi, Chiyoda-ku
Tokyo, Japan 100-0004
Tel.: +81 3 3245 7278
Fax: +81 3 3245 7444
E-mail: shimomura@zk.zennoh.or.jp

Mr Warren STRAUSS
Monsanto Compagny
Tel.:+1 202 3832845
Fax:+1 202 78303
E-mail: warren.m.strauss@stl.monsanto.com

Dr Yoshiyuki TAKIMOTO
Sumitomo Chemical Co. Ltd.
Tel.:+81 797 742012
Fax:+ 81 797 742134
E-mail: takimotoy@sc.surmitomo-chem.co.jp

Mr Yukiharu TANAKA
Manager, Registration & Regulatory Affairs Section
Agro Frontier Department
Arysta LifeScience Corporation
8-1, Akashi-cho, Chuo-ku, Tokyo
104-6591, Japan
Tel.: +81 35474583
Fax: +81 35474695
E-mail: tanaka_yukiharu@arysta-ls.com

Dr Gabriele TIMME
Bayer AG
Bayer CropScience
Development/Registration Strategy
Agrochemicals Centre Monheim
D-51368 Leverkusen
Tel.: + 49 2173 383882
Fax: + 49 2173 383572
E-mail: Gabriele.Timme.gt@bayer-ag.de

Dr Stephen WRATTEN
Manager of Registrations
Monsanto Company
800 North Lindbergh Boulevard
St. Louis, MO 63167
Tel.: +1 314 694-158
Fax: +1 314 694-4028
E-mail: stephen.j.wratten@monsanto.com

Mr Hiroyuki YOSHIDA
Nissan Chemical Industries, Ltd.
Kowa Hitotsubashi Bul.
7-1, 3-Chome, Kanda-Nishiki-Cho
Chiyoda-ku, Tokyo 101-0054
Japan
Tel: +81 3 3296 8151
Fax: 81 3 3296 8016
E-mail: yoshidahi@nissanchem.co.jp

Mr F.J. RAVENEY
Agrilex UK Ltd
P.O.BOX 31
Robertsbridge TN32 5AZ
UK
Tel: +44 1580 882059
Fax: +44 1580 882057
E-mail: fjr@agrilexuk.com

Dr R.B. DOHAREY
Joint Commissioner (S&R)
Govt. Of INDIA
Ministry of Consumers Affairs, Food and Public istribution
(Dept of Food & Public Distribution)
Krishi Bhavan
New Delhi-110001
Tel: +3383108 (office)
Tel: +6886776 (Residence)
Fax: +3782213

INSTITUTE OF FOOD TECHNOLOGISTS (IFT)

Elizabeth J. CAMPBELL
Senior Consultant
AAC Consulting Group, Inc
7361 Calhoun Place
Rockville, MD 20855
Tel. : +301 838-3120
Fax: +301 838-3182
E-mail : ecampbell@aacgroup.com

INTERNATIONAL BANANA ASSOCIATION

Mrs Caroline A. HARRIS
Manager, International Regulatory Affairs
Novigen Sciences, Ltd
2D Hornbeam Park Oval, Harrogate
North Yorkshire HG2 8RB
United Kingdom
Tel :+44 1423 853201
Fax:+441423 810431
E-mail : charris@novigensci.co.uk

INTERNATIONAL CO-OPERATIVE ALLIANCE (ICA)

Mr Kazuo ONITAKE
Safety Policy Service
Japanese Consumers Co-operative Union
Co-op Plaza 3-29-8, Shibuya, Shibuyaku
Tokyo 150-8913 Japan
Tel.: +81 3 5778 8109
Fax: +81 3 5778 8008
E-mail: kazuo.onitake@jccu.coop

INTERNATIONAL UNION OF PURE AND APPLIED CHEMISTRY (IUPAC)

Dr Kenneth D. RACKE
Global Regulatory Leader
Dow AgroSciences
9330 Zionsville Road
Bldg 308/2B
Indianapolis, IN 46268
USA
Phone: 1-317-337-4654
Fax:1-317-337-3810
Email: kracke@dow.com

Dr Sue-Sun WONG
Chief of Residue Control Department
Taiwan Agricultural Chemicals & Toxic Substances Research Institute
11 Kung-Ming Road
Wufon
Taichung Hsien
Taiwan
Phone: 886-4-23300612
Fax: 886-4-23324738
Email: sswong@tactri.gov.tw

INTERNATIONAL ORGANIZATION OF SPICE TRADE ASSOCIATION (IOSTA)

Dr Han HERWEIJER
Director
Man-Producten B.V.
P.O Box 253
3000 AG Rotterdam
Tel.: +31 10 280 1333
Fax: +31 10 4147425
E-mail: jherweijer@manproducten.nl

Elizabeth ERMAN
American Spice Trade Association, Inc.
2025 M Street, NW
Suite 800
Washington, DC 20036-3309
USA
Tel : +202 367 1127
Fax: +202 367 2225
E-mail: elizabeth-erman@astaspice.org

FOOD AND AGRICULTURE ORGANIZATION OF THE UNITED NATIONS (FAO)
ORGANISATION DES NATIONS UNIES POUR L'ALIMENTATION ET L'AGRICULTURE
ORGANIZACION DE LAS NACIONES UNIDAS PARA LA AGRICULTURE Y LA ALIMENTACION

Dr Amelia W. TEJADA
FAO Joint Secretary to JMPR
Plant Production and Protection Division
FAO
Viale delle Caracalla
00100 Rome
Italy
Tel.: +39 06 5705 4010
Fax: +39 06 5705 6347
E-mail: amelia.tejada@fao.org

Dr G. VAAGT
FAO
Viale delle Caracalla
00100 Rome
Italy
Tel.: +39 06 5705
Fax: +39 06 5705
E-mail: gero.vaagt@fao.org

FAO/IAEA

Dr Arpad AMBRUS
Head, Agrochemicals Unit
FAO/IAEA Agriculture and Biotechnology Laboratory
Agency's Laboratories (Seibersdorf and Headquarters)
Department of Nuclear Sciences and Applications
Tel: + 43 1 2600-28395
Fax: + 43 1 2600-28222
E-mail: A.Ambrus@iaea.org

WORLD HEALTH ORGANIZATION (WHO)
ORGANISATION MONDIALE DE LA SANTE (OMS)
ORGANIZACION MUNDIAL DE LA SALUD

Dr J.L. HERRMAN
International Programme on Chemical Safety
World Health Organization
1211 Geneva 27
Switzerland
Tel.: +41 22 791 3569
Fax: +41 22 791 4848
E-mail: herrmanj@who.int

Dr Gerald G. MOY
Programme on Food Safety
World Health Organization
1211 Geneva 27
Switzerland
Tel.: +41 22 791 3698
Fax: +41 22 791 4807
E-mail: moyg@who.ch

Mr Samuel W. PAGE
Scientist
International Programme on Chemical Safety
WHO
20, Avenue Appia
CH-1211 Geneva 27
Switzerland
Tel : +41227913573
Fax: +41227914848
E-mail : pages@who.int

NETHERLANDS SECRETARIAT
SECRETARIAT PAYS-BAS
SECRETARIA PAISES-BAJOS

Dr Joop W. DORNSEIFFEN
Ministry of Health, Welfare and Sport
Directorate of Public Health
P.O. Box 20350
2500 EJ The Hague
The Netherlands
Tel.: +31 70 340 6961
Fax: +31 70 340 5554
E-mail: jw.dornseiffen@minvws.nl

Mrs Karin A. SCHENKEVELD
Ministry of Health, Welfare and Sport
Directorate of Public Health
P.O. Box 20350
2500 EJ The Hague
The Netherlands
Tel.: +31 70 340 5188
Fax: +31 70 340 5177
E-mail: ka.schenkeveld@minvws.nl

Ms Sue BAKER
Ministry of Health, Welfare and Sport
Directorate of Public Health
P.O. Box 20350
2500 EJ The Hague
The Netherlands
Tel.: +31 70 340 5080
Fax: +31 70 340 5177
E-mail: s.baker@minvws.nl

Ms Anneke CORTENBACH
Ministry of Health, Welfare and Sport
Directorate of Public Health
P.O. Box 20350
2500 EJ The Hague
The Netherlands
Tel.: +31 70 340 6880
Fax: +31 70 340 5554
E-mail: at.cortenbach@minvws.nl

Mrs Peggy POEPON
Ministry of Health Welfare and Sport
Directorate of Public Health
P.O. Box 20350
2500 EJ The Hague
The Netherlands
Tel.: +31 70 340 7285
Fax: +31 70 340 7303
E-mail: tp.poepon@minvws.nl

Ir Peter D.A. OLTHOF
Ministry of Health, Welfare and Sport
Directorate of Public Health
P.O. Box 20350
2500 EJ The Hague
The Netherlands
Tel.: +31 70 340 6957
Fax: +31 70 340 5554
E-rnail: pda.olthof@worldonline.nl

Mr Wout BUITENWEG
Ministry of Health, Welfare and Sport
Directorate of Public Health
P.O. Box 20350
2500 EJ The Hague
The Netherlands
Tel.: +31 70 340 5122
Fax: +31 70 340 7834
E-mail: w.buitenweg@minvws.nl

Dr Renske HITTENHAUSEN-GELDERBLOM
Ministry of Health, Welfare and Sport
Inspectorate for Health Protection
Hoogte Kadijk 401
1018 BK Amsterdam
The Netherlands
Tel.: +31 20 524 4600
Fax: +31 20 524 4700
E-mail: renske.hittenhausen-gelderblom@kvw.nl

Ir Rob TOP
Ministry of Health, Welfare and Sport
Directorate of Public Health
P.O. Box 20350
2500 EJ The Hague
The Netherlands
Tel.: +31 70 340 6963
Fax: +31 70 340 5554
E-mail: r.top@minvws.nl

Dr Carin E.J. CUIJPERS
Ministry of Health, Welfare and Sport
Directorate of Public Health
P.O. Boz 20350
2500 EJ The Hague
The Netherlands
Tel: +31 70 340 5578
Fax: +31 70 340 5554
E-mail: ce.cuijpers@minvws.nl

Ir. Bas van der HEIDE
Ministry of Health, Welfare and Sport
Directorate of Public Health
P.O. Boz 20350
2500 EJ The Hague
The Netherlands
Tel: +31 70 340 5619
Fax: +31 70 340 5554
E-mail: : b.vd.heide@minvws.nl

Alma VAN DER GREFT
Ministry of Health, Welfare and Sport
Directorate of Public Health
P.O. Boz 20350
2500 EJ The Hague
The Netherlands
Tel: +31 70 340 5695
Fax: +31 70 340 5554
E-mail: am.vd.greft@minvws.nl

Drs Lisanne VAN DER LEM
Ministry of Health, Welfare and Sport
Directorate of Public Health
P.O. Boz 20350
2500 EJ The Hague
The Netherlands
Tel: +31 70 340 5447
Fax: +31 70 340 5554
E-mail: l.vd.lem@minvws.nl

JOINT FAO/WHO SECRETARIAT

Dr Alan RANDELL
Secretary
Codex Alimentarius Commission
FAO
Viale delle Terme di Caracalla
00100 Rome
Italy
Tel.: +39 06 570 54390
Fax: +39 06 570 54593
E-mail: alan.randell@fao.org

Dr Jeronimas MASKELIUNAS
Food Standards Officer
Joint FAO/WHO Food Standards Programme
FAO
Viale delle Terme di Caracalla
00100 Rome
Italy
Tel.: +39 06 5705 3967
Fax: + 39 06 570 54593
E-mail: jeronimas.maskeliunas@fao.org

DRAFT AND REVISED DRAFT MAXIMUM RESIDUE LIMITS FOR PESTICIDES
(Advanced to Step 8 and to Step 5/8 of the Codex Procedure)

		MRL	*Step*	*Notes*
MRLs for Consideration at Step 8				
15	**CHLORMEQUAT**			
GC 640	Barley	2	8	
SO 691	Cotton seed	0.5	8	
AF 647	Oat forage (green)	100	8	
SO 495	Rape seed	5	8	
OC 495	Rape seed oil, Crude	0.1	8	
AF 650	Rye forage (green)	100	8	
CF 1251	Rye wholemeal	4	8	
20	**2,4-D**			
FB 18	Berries and other small fruits	0.1	8	
MO 105	Edible offal (mammalian)	5	8	
AS 162	Hay or fodder (dry) of grasses	400	8	
MM 95	Meat (from mammals other than marine mammals)	0.2	8	
ML 106	Milks	0.01	8	
FP 9	Pome fruits	0.01	8	
PM 110	Poultry meat	0.05	8	
PO 111	Poultry, Edible offal of	0.05	8	
GC 651	Sorghum	0.01	8	
VD 541	Soya bean (dry)	0.01	8	
AL 541	Soya bean fodder	0.01	8	
AL 1265	Soya bean forage (green)	0.01	8	
27	**DIMETHOATE**			
VS 621	Asparagus	0.05	8	
VB 403	Cabbage, Savoy	0.05	8	
MO 812	Cattle, Edible offal of	0.05	8	
PE 112	Eggs	0.05	8	
MF 100	Mammalian fats (except milk fats)	0.05	8	
MM 96	Meat of cattle, goats, horses, pigs & sheep	0.05	8	
ML 107	Milk of cattle, goats & sheep	0.05	8	
VA 385	Onion, Bulb	0.05	8	
PF 111	Poultry fats	0.05	8	
PM 110	Poultry meat	0.05	8	
PO 111	Poultry, Edible offal of	0.05	8	
MO 822	Sheep, Edible offal of	0.05	8	
GC 651	Sorghum	0.01	8	

		MRL	***Step***	***Notes***
49	**MALATHION**			
VD 71	Beans (dry)	2	8	
VO 51	Peppers	0.1	8	
VL 502	Spinach	3	8	
VO 448	Tomato	0.5	8	
VR 506	Turnip, Garden	0.2	8	
56	**2-PHENYLPHENOL**			
AB 1	Citrus pulp, Dry	60	8	
JF 4	Orange juice	0.5	8	
64	**QUINTOZENE**			
GC 640	Barley	0.01	8	
AS 640	Barley straw and fodder, Dry	0.01	8	
VB 400	Broccoli	0.05	8	
VB 41	Cabbages, Head	0.1	8	
PM 840	Chicken meat	0.1	8	
PO 840	Chicken, Edible offal of	0.1	8	
VD 526	Common bean (dry)	0.02	8	
VP 526	Common bean (pods and/or immature seeds)	0.1	8	
SO 691	Cotton seed	0.01	8	
PE 112	Eggs	0.03	8	
GC 645	Maize	0.01	8	
AS 645	Maize fodder	0.01	8	
AF 645	Maize forage	0.01	8	
AL 72	Pea hay or pea fodder (dry)	0.05	8	
SO 697	Peanut	0.5	8	
VD 72	Peas (dry)	0.01	8	
VO 445	Peppers, Sweet	0.05	8	
VD 541	Soya bean (dry)	0.01	8	
AL 541	Soya bean fodder	0.01	8	
AL 1265	Soya bean forage (green)	0.01	8	
VR 596	Sugar beet	0.01	8	
VO 448	Tomato	0.02	8	
GC 654	Wheat	0.01	8	
AS 654	Wheat straw and fodder, Dry	0.03	8	
72	**CARBENDAZIM**			
FI 327	Banana	0.2	8	
GC 640	Barley	0.5	8	
AS 640	Barley straw and fodder, Dry	2	8	Based on Carbendazim data
VD 71	Beans (dry)	0.5	8	
VR 577	Carrot	0.2	8	
MM 812	Cattle meat	0.05	8	
PF 840	Chicken fat	0.05	8	
VC 424	Cucumber	0.05	8	

		MRL	***Step***	***Notes***
MO 105	Edible offal (mammalian)	0.05	8	
PE 112	Eggs	0.05	8	
VP 529	Garden pea, Shelled	0.02	8	
VC 425	Gherkin	0.05	8	
FB 269	Grapes	3	8	
ML 106	Milks	0.05	8	
FC 4	Oranges, Sweet, Sour	1	8	
FI 353	Pineapple	5	8	
PM 110	Poultry meat	0.05	8	
SO 495	Rape seed	0.05	8	
AS 649	Rice straw and fodder, Dry	15	8	Based only on Benomyl data
CM 649	Rice, Husked	2	8	
GC 650	Rye	0.05	8	Changed from 0.1 to 0.05 (*)
GC 654	Wheat	0.05	8	
AS 654	Wheat straw and fodder, Dry	1	8	
79	**AMITROLE**			
FB 269	Grapes	0.05	8	
FP 9	Pome fruits	0.05	8	
FS 12	Stone fruits	0.05	8	
83	**DICLORAN**			
VR 577	Carrot	15	8	
87	**DINOCAP**			
FP 226	Apple	0.2	8	
VC 45	Fruiting vegetables, Cucurbits	0.05	8	
FS 247	Peach	0.1	8	
VO 51	Peppers	0.2	8	
FB 275	Strawberry	0.5	8	Except glasshouse-grown strawberry
VO 448	Tomato	0.3	8	
132	**METHIOCARB**			
FB 275	Strawberry	1	8	
144	**BITERTANOL**			
VO 448	Tomato	3	8	
175	**GLUFOSINATE-AMMONIUM**			
AM 660	Almond hulls	0.5	8	
FI 30	Assorted tropical and sub-tropical fruits - inedible peel	0.05	8	Except banana.
MO 105	Edible offal (mammalian)	0.1	8	
PE 112	Eggs	0.05	8	
AS 645	Maize fodder	10	8	Delete (*)
AF 645	Maize forage	5	8	
MM 95	Meat (from mammals other than marine mammals)	0.05	8	
ML 106	Milks	0.02	8	

		MRL	***Step***	***Notes***
PM 110	Poultry meat	0.05	8	
PO 111	Poultry, Edible offal of	0.1	8	
VD 541	Soya bean (dry)	2	8	
TN 85	Tree nuts	0.1	8	

188 FENPROPIMORPH

FI 327	Banana	2	8	

193 FENPYROXIMATE

MO 1280	Cattle kidney	0.01	8	
MO 1281	Cattle liver	0.01	8	
MM 812	Cattle meat	0.02	8	
ML 812	Cattle milk	0.005	8	
DH 1100	Hops, Dry	10	8	

199 KRESOXIM-METHYL

GC 640	Barley	0.1	8	
MO 105	Edible offal (mammalian)	0.05	8	
MF 100	Mammalian fats (except milk fats)	0.05	8	
MM 95	Meat (from mammals other than marine mammals)	0.05	8	
ML 106	Milks	0.01	8	
FP 9	Pome fruits	0.2	8	
PM 110	Poultry meat	0.05	8	

200 PYRIPROXIFEN

MM 812	Cattle meat	0.01	8	
MO 812	Cattle, Edible offal of	0.01	8	
SO 691	Cotton seed	0.05	8	
OC 691	Cotton seed oil, Crude	0.01	8	
OR 691	Cotton seed oil, Edible	0.01	8	
MM 814	Goat meat	0.01	8	
MO 814	Goat, Edible offal of	0.01	8	

		MRL	***Step***	***Notes***

MRLs for Consideration at Step 5/8

7 CAPTAN

TN 660	Almonds	0.3	5/8
VR 589	Potato	0.05	5/8

15 CHLORMEQUAT

PE 112	Eggs	0.1	5/8
MM 814	Goat meat	0.2	5/8
MO 98	Kidney of cattle, goats, pigs & sheep	0.5	5/8
MO 99	Liver of cattle, goats, pigs & sheep	0.1	5/8
AS 645	Maize fodder	7	5/8
AF 645	Maize forage	15	5/8
MM 97	Meat of cattle, pigs & sheep	0.2	5/8
ML 107	Milk of cattle, goats & sheep	0.5	5/8
PM 110	Poultry meat	0.04	5/8
PO 111	Poultry, Edible offal of	0.1	5/8

63 PYRETHRINS

FC 1	Citrus fruits	0.05	5/8
VC 45	Fruiting vegetables, Cucurbits	0.05	5/8
AL 72	Pea hay or pea fodder (dry)	1	5/8
AL 528	Pea vines (green)	10	5/8
SO 697	Peanut	0.5	5/8
VO 51	Peppers	0.05	5/8
VR 75	Root and tuber vegetables	0.05	5/8
VO 448	Tomato	0.05	5/8

PROPOSED DRAFT MAXIMUM RESIDUE LIMITS FOR PESTICIDES
(Advanced to Step 5 of the Codex Procedure)

		MRL	***Step***	***Notes***
7	**CAPTAN**			
VC 424	Cucumber	3	5	
VC 46	Melons, except watermelon	10	5	
FS 247	Peach	20	5	
FP 9	Pome fruits	15	5	
FB 272	Raspberries, Red, Black	20	5	
15	**CHLORMEQUAT**			
CF 1250	Rye flour	3	5	
AS 81	Straw and fodder (dry) of cereal grains	30	5	
GC 653	Triticale	3	5	
17	**CHLORPYRIFOS**			
AL 1020	Alfalfa fodder	5	5	
AL 1021	Alfalfa forage (green)	20	5	
TN 660	Almonds	0.05	5	
FI 327	Banana	2	5	
VB 400	Broccoli	2	5	
VB 41	Cabbages, Head	1	5	
VR 577	Carrot	0.1	5	
MO 1280	Cattle kidney	0.01	5	
MO 1281	Cattle liver	0.01	5	
MM 812	Cattle meat	1	5	
VB 404	Cauliflower	0.05	5	
SB 716	Coffee beans	0.05	5	
VP 526	Common bean (pods and/or immature seeds)	0.01	5	
DF 269	Dried grapes (=currants, raisins and sultanas)	0.1	5	
PE 112	Eggs	0.01	5	
FB 269	Grapes	0.5	5	
GC 645	Maize	0.05	5	
AS 645	Maize fodder	10	5	
AF 645	Maize forage	20	5	
OR 645	Maize oil, Edible	0.2	5	
ML 107	Milk of cattle, goats & sheep	0.02	5	
VA 385	Onion, Bulb	0.2	5	
AL 528	Pea vines (green)	1	5	
FS 247	Peach	0.5	5	
VP 63	Peas (pods and succulent=immature seeds)	0.01	5	
TN 672	Pecan	0.05	5	
VO 445	Peppers, Sweet	2	5	
MM 818	Pig meat	0.02	5	

		MRL	***Step***	***Notes***
MO 818	Pig, Edible offal of	0.01	5	
FS 14	Plums (including prunes)	0.5	5	
FP 9	Pome fruits	1	5	
PM 110	Poultry meat	0.01	5	
PO 111	Poultry, Edible offal of	0.01	5	
MM 822	Sheep meat	1	5	
MO 822	Sheep, Edible offal of	0.01	5	
GC 651	Sorghum	0.5	5	
AS 651	Sorghum straw and fodder, Dry	2	5	
FB 275	Strawberry	0.3	5	
VR 596	Sugar beet	0.05	5	
AV 596	Sugar beet leaves or tops	40	5	
VO 447	Sweet corn (corn-on-the-cob)	0.01	5	
TN 678	Walnuts	0.05	5	
GC 654	Wheat	0.5	5	
CF 1211	Wheat flour	0.1	5	
AS 654	Wheat straw and fodder, Dry	5	5	
21	**DDT**			
PM 110	Poultry meat	0.1-0.3	5	Add "(fat)"
49	**MALATHION**			
CF 1211	Wheat flour	0.2	5	
59	**PARATHION-METHYL**			
AL 1020	Alfalfa fodder	70	5	
AL 1021	Alfalfa forage (green)	70	5	
FP 226	Apple	0.2	5	
VB 41	Cabbages, Head	0.05	5	
SO 691	Cotton seed	25	5	
OC 691	Cotton seed oil, Crude	10	5	
OR 691	Cotton seed oil, Edible	10	5	
DF 269	Dried grapes (=currants, raisins and sultanas)	1	5	
FB 269	Grapes	0.5	5	
GC 645	Maize	0.1	5	
CF 1255	Maize flour	0.05	5	
OC 645	Maize oil, Crude	0.2	5	
OR 645	Maize oil, Edible	0.1	5	
AL 72	Pea hay or pea fodder (dry)	70	5	
AL 528	Pea vines (green)	40	5	
FS 247	Peach	0.3	5	
VD 72	Peas (dry)	0.3	5	
SO 495	Rape seed	0.05	5	
OC 495	Rape seed oil, Crude	0.2	5	
OR 495	Rapeseed oil, Edible	0.2	5	
CF 1211	Wheat flour	2	5	
63	**PYRETHRINS**			
DF 167	Dried fruits	0.2	5	
VD 70	Pulses	0.1	5	Change to Po

		MRL	***Step***	***Notes***
65	**THIABENDAZOLE**			
FI 326	Avocado	15	5	
MO 1280	Cattle kidney	1	5	
MO 1281	Cattle liver	0.3	5	
ML 812	Cattle milk	0.2	5	
FC 1	Citrus fruits	3	5	
FI 345	Mango	5	5	
VO 450	Mushrooms	60	5	
FI 350	Papaya	10	5	
FP 9	Pome fruits	3	5	
VR 589	Potato	15	5	Postharvest use

CODEX MAXIMUM RESIDUE LIMITS FOR PESTICIDES RECOMMENDED FOR REVOCATION

		MRL	*Step*	*Notes*
20 2,4-D				
FB 264	Blackberries	0.1	CXL-D	
MM 95	Meat (from mammals other than marine mammals)	0.05	CXL-D	
ML 106	Milks	0.05	CXL-D	
FB 272	Raspberries, Red, Black	0.1	CXL-D	
GC 651	Sorghum	0.05	CXL-D	
FB 19	Vaccinium berries, including bearberry	0.1	CXL-D	
163 ANILAZINE				
GC 640	Barley	0.2	CXL-D	
AS 640	Barley straw and fodder, Dry	10	CXL-D	
MM 812	Cattle meat	0.02	CXL-D	
MO 812	Cattle, Edible offal of	0.02	CXL-D	
VS 624	Celery	10	CXL-D	
PE 112	Eggs	0.02	CXL-D	
MM 814	Goat meat	0.02	CXL-D	
MO 814	Goat, Edible offal of	0.02	CXL-D	
ML 106	Milks	0.01	CXL-D	
PM 110	Poultry meat	0.02	CXL-D	
PO 111	Poultry, Edible offal of	0.02	CXL-D	
VO 448	Tomato	10	CXL-D	
GC 654	Wheat	0.1	CXL-D	
AS 654	Wheat straw and fodder, Dry	10	CXL-D	
72 CARBENDAZIM				
FI 326	Avocado	0.5	CXL-D	
FI 327	Banana	1	CXL-D	
AS 640	Barley straw and fodder, Dry	2	CXL-D	
VD 71	Beans (dry)	2	CXL-D	
MM 812	Cattle meat	0.1	CXL-D	
VS 624	Celery	2	CXL-D	
PF 840	Chicken fat	0.1	CXL-D	
VC 424	Cucumber	0.5	CXL-D	
PE 112	Eggs	0.1	CXL-D	
VC 425	Gherkin	2	CXL-D	
ML 106	Milks	0.1	CXL-D	
VA 385	Onion, Bulb	2	CXL-D	
PM 110	Poultry meat	0.1	CXL-D	
SO 495	Rape seed	0.1	CXL-D	
AS 649	Rice straw and fodder, Dry	15	CXL-D	
VR 508	Sweet potato	1	CXL-D	
AS 654	Wheat straw and fodder, Dry	5	CXL-D	

		MRL	***Step***	***Notes***
17	**CHLORPYRIFOS**			
VS 624	Celery	0.05	CXL-D	
VO 440	Egg plant	0.2	CXL-D	
VL 480	Kale	1	CXL-D	
FI 341	Kiwifruit	2	CXL-D	
VL 482	Lettuce, Head	0.1	CXL-D	
VO 450	Mushrooms	0.05	CXL-D	
VR 589	Potato	0.05	CXL-D	
FB 272	Raspberries, Red, Black	0.2	CXL-D	
82	**DICHLOFLUANID**			
GC 640	Barley	0.1	CXL-D	
FS 13	Cherries	2	CXL-D	
VP 526	Common bean (pods and/or immature seeds)	2	CXL-D	
GC 647	Oats	0.1	CXL-D	
GC 650	Rye	0.1	CXL-D	
GC 654	Wheat	0.1	CXL-D	
AS 654	Wheat straw and fodder, Dry	0.5	CXL-D	
83	**DICLORAN**			
VR 577	Carrot	10	CXL-D	
27	**DIMETHOATE**			
VA 385	Onion, Bulb	0.2	CXL-D	
37	**FENITROTHION**			
FP 226	Apple	0.5	CXL-D	
VB 41	Cabbages, Head	0.5	CXL-D	
SB 715	Cacao beans	0.1	CXL-D	
VB 404	Cauliflower	0.1	CXL-D	
FS 13	Cherries	0.5	CXL-D	
FC 1	Citrus fruits	2	CXL-D	
VC 424	Cucumber	0.05	CXL-D	
VO 440	Egg plant	0.1	CXL-D	
FB 269	Grapes	0.5	CXL-D	
VA 384	Leek	0.2	CXL-D	
VL 482	Lettuce, Head	0.5	CXL-D	
VA 385	Onion, Bulb	0.05	CXL-D	
FS 247	Peach	1	CXL-D	
FP 230	Pear	0.5	CXL-D	
VP 63	Peas (pods and succulent=immature seeds)	0.5	CXL-D	
VO 51	Peppers	0.1	CXL-D	
VR 589	Potato	0.05	CXL-D	
VR 494	Radish	0.2	CXL-D	
VD 541	Soya bean (dry)	0.1	CXL-D	
FB 275	Strawberry	0.5	CXL-D	
DT 1114	Tea, Green, Black	0.5	CXL-D	

		MRL	***Step***	***Notes***
VO 448	Tomato	0.5	CXL-D	
39	**FENTHION**			
MM 95	Meat (from mammals other than marine mammals)	2	CXL-D	(fat)
ML 106	Milks	0.05	CXL-D	(F)
175	**GLUFOSINATE-AMMONIUM**			
FI 341	Kiwifruit	0.05	CXL-D	
AF 645	Maize forage	0.2	CXL-D	
VD 541	Soya bean (dry)	0.1	CXL-D	
49	**MALATHION**			
VD 71	Beans (dry)	8	CXL-D	
FP 230	Pear	0.5	CXL-D	
VO 51	Peppers	0.5	CXL-D	
VL 502	Spinach	8	CXL-D	
VO 448	Tomato	3	CXL-D	
VR 506	Turnip, Garden	3	CXL-D	
124	**MECARBAM**			
MM 812	Cattle meat	0.01	CXL-D	
ML 812	Cattle milk	0.01	CXL-D	
MO 812	Cattle, Edible offal of	0.01	CXL-D	
FC 1	Citrus fruits	2	CXL-D	
53	**MEVINPHOS**			
VB 400	Broccoli	1	CXL-D	
VB 402	Brussels sprouts	1	CXL-D	
VB 404	Cauliflower	1	CXL-D	
FC 1	Citrus fruits	0.2	CXL-D	
VC 424	Cucumber	0.2	CXL-D	
FB 269	Grapes	0.5	CXL-D	
VC 46	Melons, except watermelon	0.05	CXL-D	
VP 63	Peas (pods and succulent=immature seeds)	0.1	CXL-D	
VL 502	Spinach	0.5	CXL-D	
FB 275	Strawberry	1	CXL-D	
VO 448	Tomato	0.2	CXL-D	
58	**PARATHION**			
FP 226	Apple	0.05	CXL-D	
FS 240	Apricot	1	CXL-D	
SO 691	Cotton seed	1	CXL-D	
VA 384	Leek	0.05	CXL-D	
FC 204	Lemon	0.5	CXL-D	
GC 645	Maize	0.1	CXL-D	
FC 206	Mandarin	0.5	CXL-D	
OC 305	Olive oil, Virgin	2	CXL-D	
FT 305	Olives	0.5	CXL-D	

		MRL	***Step***	***Notes***
FC 4	Oranges, Sweet, Sour	0.5	CXL-D	
FS 247	Peach	1	CXL-D	
VR 589	Potato	0.05	CXL-D	
GC 651	Sorghum	5	CXL-D	
VD 541	Soya bean (dry)	0.05	CXL-D	
SO 702	Sunflower seed	0.05	CXL-D	

59 PARATHION-METHYL

VS 620	Artichoke globe	2	CXL-D	
VB 400	Broccoli	0.2	CXL-D	
VR 577	Carrot	1	CXL-D	
VS 624	Celery	5	CXL-D	
FS 13	Cherries	0.01	CXL-D	
VP 526	Common bean (pods and/or immature seeds)	0.05	CXL-D	
VP 528	Garden pea (young pods)	1	CXL-D	
FB 268	Gooseberry	0.01	CXL-D	
DH 1100	Hops, Dry	1	CXL-D	
VL 482	Lettuce, Head	0.05	CXL-D	
VL 483	Lettuce, Leaf	0.5	CXL-D	
VP 534	Lima bean (young pods and/or immature beans)	0.05	CXL-D	
VL 485	Mustard greens	0.5	CXL-D	
FB 272	Raspberries, Red, Black	0.01	CXL-D	
CM 649	Rice, Husked	1	CXL-D	
VL 502	Spinach	0.5	CXL-D	
VL 506	Turnip greens	2	CXL-D	
VR 506	Turnip, Garden	0.05	CXL-D	

171 PROFENOFOS

VB 402	Brussels sprouts	0.5	CXL-D	
VB 404	Cauliflower	0.5	CXL-D	
VP 526	Common bean (pods and/or immature seeds)	0.1	CXL-D	
FC 4	Oranges, Sweet, Sour	1	CXL-D	
VD 541	Soya bean (dry)	0.05	CXL-D	
OR 541	Soya bean oil, Refined	0.05	CXL-D	
VR 596	Sugar beet	0.05	CXL-D	

75 PROPOXUR

FP 226	Apple	3	CXL-D	
FB 264	Blackberries	3	CXL-D	
VP 522	Broad bean (green pods and immature seeds)	0.05	CXL-D	
VB 403	Cabbage, Savoy	0.5	CXL-D	
VR 577	Carrot	0.05	CXL-D	
FS 13	Cherries	3	CXL-D	
VP 526	Common bean (pods and/or immature seeds)	1	CXL-D	
VC 424	Cucumber	0.1	CXL-D	
FB 279	Currant, Red, White	3	CXL-D	

		MRL	***Step***	***Notes***
VP 528	Garden pea (young pods)	0.05	CXL-D	
FB 268	Gooseberry	3	CXL-D	
VB 405	Kohlrabi	0.2	CXL-D	
VA 384	Leek	1	CXL-D	
AL 157	Legume animal feeds	1	CXL-D	
VL 482	Lettuce, Head	0.5	CXL-D	
MM 95	Meat (from mammals other than marine mammals)	0.05	CXL-D	
ML 106	Milks	0.05	CXL-D	
VA 385	Onion, Bulb	0.05	CXL-D	
FS 247	Peach	3	CXL-D	
FP 230	Pear	3	CXL-D	
FS 14	Plums (including prunes)	3	CXL-D	
VR 589	Potato	0.02	CXL-D	
CM 649	Rice, Husked	0.1	CXL-D	
VL 502	Spinach	2	CXL-D	
FB 275	Strawberry	3	CXL-D	
VO 448	Tomato	0.05	CXL-D	

63 PYRETHRINS

MD 180	Dried fish	3	CXL-D	
DV 168	Dried vegetables	1	CXL-D	
SO 88	Oilseed	1	CXL-D	

64 QUINTOZENE

VB 400	Broccoli	0.02	CXL-D	
VB 41	Cabbages, Head	0.02	CXL-D	
VD 526	Common bean (dry)	0.2	CXL-D	
VP 526	Common bean (pods and/or immature seeds)	0.01	CXL-D	
SO 691	Cotton seed	0.03	CXL-D	
SO 697	Peanut	2	CXL-D	
SO 703	Peanut, Whole	5	CXL-D	
VO 445	Peppers, Sweet	0.01	CXL-D	
VO 448	Tomato	0.1	CXL-D	

167 TERBUFOS

GC 640	Barley	0.01	CXL-D	

65 THIABENDAZOLE

FB 275	Strawberry	3	CXL-D	

77 THIOPHANATE-METHYL

FP 226	Apple	5	CXL-D	
VR 577	Carrot	5	CXL-D	
VS 624	Celery	20	CXL-D	
GC 80	Cereal grains	0.1	CXL-D	
FS 13	Cherries	10	CXL-D	
PM 840	Chicken meat	0.1	CXL-D	
FC 1	Citrus fruits	10	CXL-D	

		MRL	***Step***	***Notes***
FB 278	Currant, Black	5	CXL-D	
FB 268	Gooseberry	5	CXL-D	
FB 269	Grapes	10	CXL-D	
VL 482	Lettuce, Head	5	CXL-D	
VO 450	Mushrooms	1	CXL-D	
FS 247	Peach	10	CXL-D	
FP 230	Pear	5	CXL-D	
FS 14	Plums (including prunes)	2	CXL-D	
FB 272	Raspberries, Red, Black	5	CXL-D	
FB 275	Strawberry	5	CXL-D	
AV 596	Sugar beet leaves or tops	5	CXL-D	
VO 448	Tomato	5	CXL-D	

APPENDIX V

PROPOSED DRAFT AMENDMENTS TO THE INTRODUCTORY SECTION OF THE RECOMMENDED METHODS OF ANALYSIS FOR PESTICIDE RESIDUES

(At Steps 5/8 of the Procedure)

1. INTRODUCTION

1.1 Scope

The analytical methods listed are those which may, from practical experience of the Codex Committee on Pesticide Residues, be considered for the determination of pesticide residues for regulatory purposes. The list, given in par.2, is not exhaustive and methods not mentioned in the list can also be applied, provided that they can be shown to produce valid results by the analyst using them.

1.2 Criteria for the selection of analytical methods

Whenever possible, the CCPR used the following criteria when selecting analytical methods:

i. Available through national or international standards organizations, books, manuals, open literature, the internet;

ii. collaboratively studied or known to have been validated in a number of laboratories. For single laboratory validated methods validation must have taken place according to Guidelines on Good Practice in Pesticide Residue Analysis as a minimum;

iii. capable of determining more than one residue, i.e. multi-residue methods;

iv. suitable for as many commodities as possible at concentrations at or below the specified MRLs;

v. applicable in a regulatory laboratory equipped with generally available analytical instrumentation.

Preference was given to gas chromatography or high performance liquid chromatography as the separation step for the methods. Under certain conditions however, screening methods as defined in the Guidelines on Good Practice in Residue Analysis may be applicable. Screening methods are indicated in the list.

1.3 Application of methods

Before applying the methods it will always be necessary to validate the method and to demonstrate the competence of the analyst. There is a further need for regular verification of the performance of the method during use. Validation and performance verification are described in the Guidelines on Good Practice in Residue Analysis.

APPENDIX VI

PROPOSED DRAFT REVISED GUIDELINES ON GOOD LABORATORY PRACTICE IN RESIDUE ANALYSIS
(At Step 5 of the Procedure)

FOREWORD

The Guidelines are intended to assist in ensuring the reliability of analytical results in checking compliance with maximum residue limits of foods moving in international trade. Reliable analytical results are essential to protect the health of consumers and to facilitate international trade.

In addition to the present Guidelines, other relevant Codex recommendations elaborated by the Codex Committee on Pesticide Residues (CCPR) in the field of enforcement of Codex maximum limits for pesticide residues are as follows:

1 Recommended Method of Sampling for the Determination of Pesticide Residues (ref.: CAC/VOL XIII - Ed.2, Part VI or CAC/PR 5-1984), as amended with respect to meat and poultry (ALINORM 91/40; see also ALINORM 89/24A, Appd. II and ALINORM 91/24A Appd. VIII).
2 Portion of Commodities to which Codex Maximum Residue Limits Apply and which should be analysed (ref.: CAC/VOL XIII - Ed. l, Part V or CAC/PR6-1984).
3 Explanatory Notes on Codex Maximum Limits for Pesticide Residues (ref.: CAC/VOL XIII - Ed. 1, Part III).
4 Recommendations for Methods of Analysis of Pesticide Residues (ref.: CAC/VOL XIII Ed. 2 part VIII or CAC/PR 8-1984).
5 Codex Classification of Food and Animal Feed (ref.: CAC/PR4-1989).

CODEX GUIDELINES ON GOOD PRACTICE IN PESTICIDE RESIDUE ANALYSIS

1. INTRODUCTION

The Codex document ALINORM 76/24 Appendix IV (Report of the ad hoc Working Group on Methods of Analysis) contained the following statement:

"It was considered that the ultimate goal in fair practice in international trade depended, among other things, on the reliability of analytical results. This in turn, particularly in pesticide residue analysis, depended not only on the availability of reliable analytical methods, but also on the experience of the analyst and on the maintenance of 'good practice in the analysis of pesticides'."

These guidelines define such good analytical practice and may be considered in three inter-related parts:

The Analyst (par. 2);

Basic Resources (par. 3);

The Analysis (par.4).

The requirements for facilities, management, personnel, quality assurance and quality control, documentation of results and raw data, and relevant subjects, which are considered as prerequisites for obtaining reliable and traceable results, are described in general in the ISO/IEC 17025 Standard (1999) and in a series of OECD GLP Guidance Documents, in the corresponding national laws and regulations. This Codex Guidelines, which are not exhaustive, outline the most essential principles and practices to be followed in the analysis of pesticide residues.

2. THE ANALYST

2.1 Residue analysis consists of a chain of procedures, most of which are known, or readily understood, by a trained chemist, but because the analyte concentrations are in the range µg/kg to mg/kg and because the analyses can be challenging, attention to detail is essential. The analyst in charge should have an appropriate professional qualification and be experienced and competent in residue analysis. Staff must be fully trained and experienced in the correct use of apparatus and in appropriate laboratory skills. In addition, each analyst using the method for the first time should complete the tests specified in sections 4.4.5 of Table 4 to demonstrate that they can use the method within the expected performance parameters established during method validation prior to

analysis of samples. They must have an understanding of the principles of pesticide residue analysis and the requirements of Analytical Quality Assurance (AQA) systems. They must understand the purpose of each stage in the method, the importance of following the methods exactly as described and of noting any unavoidable deviations. They must also be trained in the evaluation and interpretation of the data that they produce. A record of training and experience must be kept for all laboratory staff.

2.2 When a laboratory for residue analysis is set up, the staff should spend some of their training period in a well established laboratory where experienced advice and training is available. If the laboratory is to be involved in the analysis for a wide range of pesticide residues, it may be necessary for the staff to gain experience in more than one expert laboratory.

3. BASIC RESOURCES

3.1 THE LABORATORY

3.1.1. The laboratory and its facilities must be designed to allow tasks to be allocated to well-defined areas where maximum safety and minimum chance of contamination of samples prevail. Laboratories should be constructed of, and utilise, materials resistant to chemicals likely to be used within them. Under ideal conditions, separate rooms would be designated for sample receipt and storage, for sample preparation, for extraction and clean-up and for instrumentation used in the determinative step. The area used for extraction and clean-up must meet solvent laboratory specifications and all fume extraction facilities must be of high quality. Sample receipt, storage and preparation should be handled in areas devoted to work at residue levels. Maintenance of sample integrity and adequate provisions for personal safety are priority requirements.

3.1.2 Laboratory safety must also be considered in terms of what is essential and what is preferable, as it must be recognised that the stringent working conditions enforced in residue laboratories in some parts of the world could be totally unrealistic in others. No smoking, eating, drinking or application of cosmetics should be permitted in the working area. Only small volumes of solvents should be held in the working area and the bulk of the solvents stored separately, away from the main working area. The use of highly toxic solvents and reagents should be minimised whenever possible. All waste solvent should be stored safely and disposed of both safely and in an environmentally friendly manner taking into account specific national regulations where available.

3.1.3 The main working area should be designed and equipped for utilisation of an appropriate range of analytical solvents. All equipment such as lights, macerators and refrigerators should be “spark free” or “explosion proof”. Extraction, clean-up and concentration steps should be carried out in a well ventilated area, preferably in fume cupboards.

3.1.4 Safety screens should be used when glassware is used under vacuum or pressure. There should be an ample supply of safety glasses, gloves and other protective clothing, emergency washing facilities and a spillage treatment kit. Adequate fire fighting equipment must be available. Staff must be aware that many pesticides have acutely or chronically toxic properties and therefore, great care is necessary in the handling of standard reference compounds.

3.2 EQUIPMENT AND SUPPLIES

3.2.1 The laboratory will require adequate, reliable, supplies of electricity and water. Adequate supplies of reagents, solvents, gas, glassware, chromatographic materials, etc., of suitable quality are essential.

3.2.2 Chromatographic equipment, balances, spectrophotometers etc. must be serviced and calibrated regularly and a record of all servicing/repairs must be maintained for every such item of equipment. Calibration is essential for equipment performing measurements. Calibration curves and comparison with standards may suffice.

3.2.3 Regular calibration and re-calibration of measuring equipment must be done where the possible change in nominal value may significantly contribute to the uncertainty of the measurement. Balances and automated pipettes/ dispensers and similar equipment must be calibrated regularly. The operating temperatures of refrigerators and freezers should be continually monitored or be checked at specified intervals. All records should be kept up-to-date and retained.

3.2.4 Equipment used must be fit for purpose.

3.2.5 All laboratories require pesticide reference standards of known and acceptably high purity. Analytical standards should be available for all parent compounds for which the laboratory is monitoring samples, as well as those metabolites that are included in MRLs.

3.2.6 All analytical standards, stock solutions and reagents whose integrity could be influenced by degradative processes must be clearly labelled with an expiry date and stored under proper conditions. ”Pure” reference standards must be kept under conditions that will minimise the rate of degradation, e.g. low temperature, exclusion of moisture, darkness. Equal care must be taken that standard solutions of pesticides are not decomposed by the effect of light or heat during storage or become concentrated owing to solvent evaporation.

4. THE ANALYSIS

The methods applied for the determination of pesticide residues should generally satisfy the criteria given in Table 3.

4.1 AVOIDANCE OF CONTAMINATION

4.1.1 One of the significant areas in which pesticide residue analysis differs significantly from macro-analysis is that of contamination and interference. Trace amounts of contamination in the final samples used for the determination stage of the method can give rise to errors such as false positive or false negative results or to a loss of sensitivity that may prevent the residue from being detected. Contamination may arise from almost anything that is used for, or is associated with, sampling, sample transport and storage, and the analyses. All glassware, reagents, organic solvents and water should be checked for possible interfering contaminants before use, by analysis of a reagent blank.

4.1.2 Polishes, barrier creams, soaps containing germicides, insect sprays, perfumes and cosmetics can give rise to interference problems and are especially significant when an electron-capture detector is being used. There is no real solution to the problem other than to ban their use by staff while in the laboratory.

4.1.3 Lubricants, sealants, plastics, natural and synthetic rubbers, protective gloves, oil from ordinary compressed air lines and manufacturing impurities in thimbles, filter papers and cotton-wool can also give rise to contamination.

4.1.4 Chemical reagents, adsorbents and general laboratory solvents may contain, adsorb or absorb compounds that interfere in the analysis. It may be necessary to purify reagents and adsorbents and it is generally necessary to use re-distilled solvents. Deionised water is often suspect; re-distilled water is preferable, although in many instances tap water or well water may be satisfactory.

4.1.5 Contamination of glassware, syringes and gas chromatographic columns can arise from contact with previous samples or extracts. All glassware should be cleaned with detergent solution, rinsed thoroughly with distilled (or other clean) water and then rinsed with the solvent to be used. Glassware to be used for trace analysis must be kept separate and must not be used for any other purpose.

4.1.6 Pesticide reference standards should always be stored at a suitable temperature in a room separate from the main residue laboratory. Concentrated analytical standard solutions and extracts should not be kept in the same storage area.

4.1.7 Apparatus containing polyvinylchloride (PVC) should be regarded as suspect and, if shown to be a source of contamination, should not be allowed in the residue laboratory. Other materials containing plasticisers should also be regarded as suspect but PTFE and silicone rubbers are usually acceptable and others may be acceptable in certain circumstances. Sample storage containers can cause contamination and glass bottles with ground glass stoppers may be required. Analytical instrumentation ideally should be housed in a separate room. The nature and importance of contamination can vary according to the type of determination technique used and the level of pesticide residue to be determined. For instance contamination problems which are important with methods based on gas chromatography or high performance liquid chromatography, may well be less significant if a spectrophotometric determination is used, and vice versa. For relatively high levels of residues, the background interference from solvents and other materials may be insignificant in comparison with the amount of residue present. Many problems can be overcome by the use of alternative detectors. If the contaminant does not interfere with the residue determination, its presence may be acceptable.

4.1.8 Residues and formulation analyses must have completely separate laboratory facilities provided. Samples and sample preparation must be kept separate from the all residue laboratory operations in order to preclude cross contamination.

4.2 RECEPTION AND STORAGE OF SAMPLES

4.2.1 Every sample received into the laboratory should be accompanied by complete information on the source of the sample, on the analysis required and on potential hazards associated with the handling of that sample.

4.2.2 On receipt of a sample it must immediately be assigned a unique sample identification code which should accompany it through all stages of the analysis to the reporting of the results. If possible, the samples should be subject to an appropriate disposal review system and records should be kept.

4.2.3 Sample processing and sub-sampling should be carried out using procedures that have been demonstrated to provide a representative analytical portion and to have no effect on the concentration of residues present.

4.2.4 If samples cannot be analysed immediately but are to be analysed quickly, they should be stored at (1 - 5 °C), away from direct sunlight, and analysed within a few days. However, samples received deep-frozen must be kept at ≤ -16 °C until analysis. In some instances, samples may require storage for a longer period before analysis. In this cases, storage temperature should be approximately - 20 °C, at which temperature enzymic degradation of pesticide residues is usually extremely slow. If prolonged storage is unavoidable, the effects of storage should be checked by analysing fortified samples stored under the same conditions for a similar period. Useful information on storage stability of pesticide residues can be found in the annual publications of FAO titled: Pesticide Residues - Evaluations prepared by the FAO/WHO JMPR, and in the information submitted by the manufacturers for supporting the registration of their pesticides.

4.2.5 When samples are to be frozen it is recommended that analytical test portions be taken prior to freezing in order to minimise the possible effect of water separation as ice crystals during storage. Care must still be taken to ensure that the entire test portion is used in the analysis.

4.2.6 The containers must not leak. Neither the containers used for storage nor their caps or stoppers should allow migration of the analyte(s) into the storage compartment.

4.3 STANDARD OPERATING PROCEDURES (SOPS)

4.3.1 SOPs should be used for all operations. The SOPs should contain full working instructions as well as information on applicability, expected performance, internal quality control (performance verification) requirements and calculation of results. It should also contain information on any hazards arising from the method, from standards or from reagents.

4.3.2 Any deviations from a SOP must be recorded and authorised by the analyst in charge.

4.4 VALIDATION OF METHODS[1]

4.4.1 Guidelines have been published for validation of analytical procedures for various purposes. The principles described in this section are considered practical and suitable for validation of pesticide residue analytical methods. The guidance is not normative. The analyst should decide on the degree of validation required to demonstrate that the method is fit for the intended purpose, and should produce the necessary validation data accordingly. For instance, the requirements for testing for compliance with MRLs or providing data for intake estimation may be quite different.

4.4.2 An analytical method is the series of procedures from receipt of a sample to the production of the final result. Validation is the process of verifying that a method is fit for the intended purpose. The method may be developed in-house, taken from the literature or otherwise obtained from a third party. The method may then be adapted or modified to match the requirements and capabilities of the laboratory and/or the purpose for which the method will be used. Typically, validation follows completion of the development of a method and it is assumed

[1] This section is based on the recommendations elaborated by an AOAC/FAO/IAEA Consultation held in Miskolc, Hungary, in 1999. The full document is available at www.iaea.org/trc and in A. Fajgelj & A. Ambrus Principles and Practices of Method Validation, Royal Society of Chemistry, 2000

that requirements such as calibration, system suitability, analyte stability, etc., have been established satisfactorily. When validating and using a method of analysis, measurements must be made within the calibrated range of the detection system used. In general, validation will precede practical application of the method to the analysis of samples but subsequent performance verification is an important continuing aspect of the process. Requirements for performance verification data are a sub-set of those required for method validation.

Proficiency testing (or other inter-laboratory testing procedures), where practicable, provides an important means for verifying the general accuracy of results generated by a method, and provides information on the between-laboratory variability of the results. However, proficiency testing generally does not address analyte stability or homogeneity and extractability of analytes in the processed sample.

Where uncertainty data are required, this information should incorporate performance verification data and not rely solely on method validation data.

4.4.3 Whenever a laboratory undertakes method development and/or method modification, the effects of analytical variables should be established, e.g. by using ruggedness tests, prior to validation. Rigorous controls must be exercised with respect to all aspects of the method that may influence the results, such as: sample size; partition volumes; variations in the performance of the clean-up systems used; the stability of reagents or of the derivatives prepared; the effects of light, temperature, solvent and storage on analytes in extracts; the effects of solvent, injector, separation column, mobile phase characteristics (composition and flow-rate), temperature, detection system, co-extractives etc. on the determination system. It is most important that the qualitative and quantitative relationship between the signal measured and the analyte sought are established unequivocally.

4.4.4 Preference should be given to methods having multi-residue and or multi-matrix applicability. The use of representative analytes or matrices is important in validating methods. For this purpose, commodities should be differentiated sufficiently but not unnecessarily. For example, some products are available in a wide range of minor manufactured variants, or cultivated varieties, or breeds, etc. Generally, though not invariably, a single variant of a particular commodity may be considered to represent others of the same commodity but, for example, a single fruit or vegetable species must not be taken to represent all fruit or vegetables (Table 5). Each case must be considered on its merits but where particular variants within a commodity are known to differ from others in their effects on method performance, analyses of those variants are required. Considerable differences in the accuracy and precision of methods, especially with respect to the determination step, may occur from species to species.

4.4.4.1 Where experience shows similar performance of extraction and clean-up between broadly similar commodities/sample matrices, a simplified approach may be adopted for performance validation. A representative commodity may be selected from Table 5 to represent each commodity group having common properties, and used for validation of the procedure or method. In Table 5, the commodities are classified according to the Codex Classification[2].

- Some examples of how far the validation data may be extended to other commodities are: **cereals**, validation for whole grains cannot be taken to apply to bran or bread but validation for wheat grain may apply to barley grain or wheat four;
- **animal products**, validation for muscle should not be taken to apply to fat or offal but validation for chicken fat may apply to cattle fat;
- **fruit and vegetables**, validation for a whole fresh product cannot be taken to apply to the dried product but validation for cabbages may apply to Brussels sprouts.

4.4.4.2 Similarly representative analytes may be used to assess the performance of a method. Compounds may be selected to cover physical and chemical properties of analytes that are intended to be determined by the method. The selection of representative analytes should be made based on the purpose and scope of analysis taking into account the following.

(a) The representative analytes selected should:

[2] Codex Alimentarius, Volume 2, 2nd ed., Pesticide Residues in Food, pp. 147-365, FAO, 1993

(i) possess sufficiently wide range of physico-chemical properties to include those of represented analytes;

(ii) be those which are likely to be detected regularly, or for which critical decisions will be made based on the results.

(b) As far as practicable, all analytes included in the initial validation process should be those which will have to be tested regularly and which can be determined simultaneously by the determination system used.

(c) The concentration of the analytes used to characterise a method should be selected to cover the accepted limits (AL, see Glossary) of all analytes planned to be sought in all commodities. Therefore the selected representative analytes should include, among others, those which have high and low ALs. Consequently, the fortification levels used in performance testing with representative analytes/representative commodities may not necessarily correspond to the actual ALs.

4.4.5 Where appropriate data are already available, it may not be necessary for the analyst to perform all the tests. However, all required information must be included or referred to in the validation records. Table 1 provides an overview of parameters to be assessed for method validation according to the status of the method to be validated. Specific parameters and criteria to be assessed are listed in table 2. Parameters to be assessed should be restricted to those that are appropriate both to the method and to the purpose for which the particular method is to be applied. In many cases, performance characteristics with respect to several parameters may be obtained simultaneously using a single experiment. Test designs where different factors are changed at the same time (factorial experiment designs), may help to minimise the resources required. The performance of the analytical method should be checked, both during its development and during its subsequent use as indicated in section 4.5, according to the criteria given in Table 3.

4.4.6 Individual (single residue) methods should be fully validated with all analyte(s) and sample materials specified for the purpose, or using sample matrices representative of those to be tested by the laboratory.

4.4.7 Group specific methods (GSM) should be validated initially with one or more representative commodities and a minimum of two representative analytes selected from the group.

4.4.8 MRMs may be validated with representative commodities and representative analytes.

4.5 PERFORMANCE VERIFICATION

4.5.1 The main purposes of performance verification are to:

- *monitor the performance of the method under the actual conditions prevailing during its use;*
- *take into account the effect of inevitable variations caused by, for instance, the composition of samples, performance of instruments, quality of chemicals, varying performance of analysts and laboratory environmental conditions;*
- *demonstrate that the performance characteristics of the method are broadly similar to those established at method validation, showing that the method is under "statistical control", and the accuracy and uncertainty of the results are comparable to those expected of the method. For this purpose, data obtained during method validation may be updated with data collected from performance verification during the regular use of the method.*

The results of internal quality control provide essential information on the long term reproducibility and other performance characteristics of the method including the analytes and commodities which were incorporated during the extension of the method.

The basic performance characteristics to be tested and the appropriate test procedures are described in Table 2.

For effective performance verification, analyse samples concurrently with appropriate quality control analyses (blank and recovery determinations, reference materials, etc.). Control charts may be used to check for trends in performance of the method and to ensure that statistical control is maintained.

4.5.2 Construction and use of control charts.

4.5.2.1 Control charts may be a useful tool for demonstrating the performance of a method and the reproducibility of its selected parameter. One example for that is the control chart for recoveries. Its application depends on the tasks of the laboratory. When a large number of the same type of sample is analysed for the

same active ingredients the control chart is based on the mean recovery and its standard deviation obtained during the regular use of the method. When small numbers of each of a large variety of samples are analysed for a great number of analytes with a multi-residue procedure the control charts cannot be applied in the usual way. In such cases, initially a control chart is constructed with the average recovery (Q) of representative analytes in representative matrices and the typical within-laboratory reproducibility coefficient of variation (CV_{Atyp}), obtained as described below. . When the average recovery data and their coefficient of variation obtained during method validation for individual analyte/sample matrices are not statistically different, each can be considered as an estimate of the true recovery and precision of the method, and with their appropriate combination the typical recovery (Q_{typ}) and coefficient of variation (CV_{Atyp}) of the method can be established and used for constructing the initial control chart. The warning and action limits are $Q_{yp} \pm 2*CV_{Atyp}*Q$ and $Q_{yp} \pm 3*CV_{Atyp}*Q$, respectively.

4.5.2.2 When the method is applied for regular analysis of various analyte/matrix combinations represented during the validation of the method, the individual recoveries are plotted on the chart. The reproducibility of the method during its normal use may be somewhat higher then obtained at the validation of the method. Therefore, if some of the recoveries are outside the warning limits or occasionally the action limits, but they are within the ranges calculated from the CV_A values specified in Table 3, no special action is required.

4.5.2.3 Based on the additional 15-20 recovery tests performed during the regular use of the method, as part of performance verification, the mean or typical recovery and the CV_A shall be recalculated and a new control chart constructed which reflects the long term reproducibility of the application of the method. The new parameters established must be within the acceptable ranges specified in Table 3.

4.5.2.4 If this is not achievable, for example in the case of particularly problematic analytes, results from samples should be reported as having poorer accuracy or precision than is normally associated with pesticide residues determination.

4.5.2.5 During the regular use of the method, if the average of the first ≥10 recovery tests for a particular analyte/sample matrix is significantly different (P=0.05) from the average recovery obtained for the representative analyte/sample matrices, the Q_{yp} and CV_{typ} are not applicable. Calculate new warning and action limits for the particular analyte/sample matrix, applying the new average recovery and the CV values measured.

4.5.2.6 If performance verification data repeatedly fall outside the warning limits (1 in 20 measurements outside the limit is acceptable), the application conditions of the method must be checked, the sources of error(s) identified, and the necessary corrective actions taken before use of the method is continued.

4.5.2.7 If performance verification data are outside the refined action limits established according to 4.5.2.1 to 4.5.2.3 section, the analytical batch involved (or at least samples in which residues found are ≥0.7 AL or 0.5 AL, for regularly and occasionally detected analytes, respectively) should be repeated.

4.5.2.8 Re-analysis of analytical portions of positive samples is another powerful way of performance verification. Their results can be used to calculate the overall within-laboratory reproducibility of the method (CV_{Ltyp}) in general or for a particular analyte/sample matrix. In this case, the CV_{Ltyp} will also include the uncertainty of sample processing, but will not indicate if the analyte is lost during the process.

4.6 CONFIRMATORY TESTS

4.6.1 When analyses are performed for monitoring or enforcement purposes, it is especially important that confirmatory data are generated before reporting on samples containing residues of pesticides that are not normally associated with that commodity, or where MRLs appear to have been exceeded. Samples may contain interfering chemicals that may be misidentified as pesticides. Examples in gas chromatography include the responses of electron-capture detectors to phthalate esters and of phosphorus-selective detectors to compounds containing sulphur and nitrogen. As a first step, the analysis should be repeated using the same method, if only one portion was analyzed initially. This will provide evidence of the repeatability of the result, if the residue is confirmed. It should be noted that the only evidence supporting the absence of detectable residues is provided by the performance verification data.

4.6.2 Confirmatory tests may be quantitative and/or qualitative but, in most cases, both types of information will be required. Particular problems occur when residues must be confirmed at or about the limit of determination but, although it is difficult to quantify residues at this level, it is essential to provide adequate confirmation of both level and identity.

4.6.3 The need for confirmatory tests may depend upon the type of sample or its known history. In some crops or commodities, certain residues are frequently found. For a series of samples of similar origin, which contain residues of the same pesticide, it may be sufficient to confirm the identity of residues in a small proportion of the samples selected randomly. Similarly, when it is known that a particular pesticide has been applied to the sample material there may be little need for confirmation of identity, although a randomly selected results should be confirmed. Where "blank" samples are available, these should be used to check the occurrence of possible interfering substances.

4.6.4 Depending upon the initial technique of determination, an alternative procedure which may be a different detection technique, may be necessary for verification of quantity. For qualitative confirmation (identity) the use of mass-spectral data, or a combination of techniques based on different physico-chemical properties, is desirable (see Table 6).

4.6.5 The necessary steps to positive identification are a matter of judgement on the analyst's part and particular attention should be paid to the choice of a method that would minimise the effect of interfering compounds. The technique(s) chosen depend(s) upon the availability of suitable apparatus and expertise within the testing laboratory. Some alternative procedures for confirmation are given in Table 6.

4.7 MASS SPECTROMETRY

4.7.1 Residue data obtained using mass spectrometry can represent the most definitive evidence and, where suitable equipment is available, it is the confirmatory technique of choice. The technique can also be used for residue screening purposes. Mass spectrometric determination of residues is usually carried out in conjunction with a chromatographic separation technique to provide retention time, ion mass/charge ratio and ion abundance data simultaneously. The particular separation technique, the mass spectrometer, the interface between them and the range of pesticides to be analysed are usually interdependent and no single combination is suitable for the analysis of all compounds. Quantitative transmission of labile analytes through the chromatographic system and interface is subject to problems similar to those experienced with other detectors. The most definitive confirmation of the presence of a residue is the acquisition of its "complete" electron-impact ionisation mass spectrum (in practice generally from m/z50 to beyond the molecular ion region). The relative abundances of ions in the spectrum and the absence of interfering ions are important considerations in confirming identity. This mode of analysis is one of the least selective and interference from contaminants introduced during the production or storage of extracts should be scrupulously avoided. Mass spectrometer data systems permit underlying interference (eg column bleed) signals to be removed by "background subtraction" but this technique must be used with caution. Increased sensitivity can usually be achieved by means of limited mass range scanning or by selected ion monitoring but the smaller the number of ions monitored (especially if these are of low mass), the less definitive are the data produced. Additional confirmation of identity may be obtained (i) by the use of an alternative chromatographic column; (ii) by the use of an alternative ionisation technique (eg chemical ionisation); (iii) by monitoring further reaction products of selected ions by tandem mass spectrometry (MS/MS or MS^n); or (iv) by monitoring selected ions at increased mass resolution. For quantification, the ions monitored should be those that are the most specific to the analyte, are subject to least interference and provide good signal-to-noise ratios. Mass spectrometric determinations should satisfy similar analytical quality control criteria to those applied to other systems.

4.7.2 Confirmation of residues detected following separation by HPLC is generally more problematic than where gas chromatography is used. If detection is by UV absorption, production of a complete spectrum can provide good evidence of identity. However, UV spectra of some pesticides are poorly diagnostic, being similar to those produced by many other compounds possessing similar functional groups or structures, and co-elution of interfering compounds can create additional problems. UV absorption data produced at multiple wavelengths may support or refute identification but, in general, they are not sufficiently characteristic on their own. Fluorescence data may be used to support those obtained by UV absorption. LC-MS can provide good supporting evidence but, because the spectra generated are generally very simple, showing little characteristic fragmentation, results produced from LC-MS are unlikely to be definitive. LC-MS/MS is a more powerful technique, combining selectivity with specificity, and often provides good evidence of identity. LC-MS techniques tend to be subject to matrix effects, especially suppression, and therefore confirmation of quantity may require the use of standard addition or isotopically-labelled standards. Derivatisation may also be used for confirmation of residues detected by HPLC (paragraph 4.6.5.4).

4.7.3 In some instances, confirmation of gas chromatographic findings is most conveniently achieved by TLC.

Identification is based on two criteria, Rf value and visualisation reaction. Detection methods based on bioassays (e.g. enzyme -, fungal groth or chloroplast inhibition) are especially suitable for qualitative confirmation as they are specific to certain type of compounds, sensitive and normally very little affected by the co-extracts. The scientific literature contains numerous references to the technique, the IUPAC Report on Pesticides (13) (Bátora, V., Vitorovic, S.Y., Thier, H.-P. and Klisenko, M.A.; Pure & Appl. Chem., 53, 1039-1049 (1981)) reviews the technique and serves as a convenient introduction. The quantitative aspects of thin-layer chromatography are, however, limited. A further extension of this technique involves the removal of the area on the plate corresponding to the Rf of the compound of interest followed by elution from the layer material and further chemical or physical confirmatory analysis. A solution of the standard pesticide should always be spotted on the plate alongside the sample extract to obviate any problems of non-repeatability of Rf. Over-spotting of extract with standard pesticide can also give useful information. The advantages of thin layer chromatography are speed, low cost and applicability to heat sensitive materials; disadvantages include (usually) lower sensitivity and separation power than instrumental chromatographic detection techniques and need for more efficient cleanup in case of detections based on chemicals colour reactions.

4.8 DERIVATISATION

This area of confirmation may be considered under three broad headings.

(a) Chemical reactions

Small-scale chemical reactions resulting in degradation, addition or condensation products of pesticides, followed by re-examination of the products by chromatographic techniques, have frequently been used. The reactions result in products possessing different retention times and/or detector response from those of the parent compound. A sample of standard pesticide should be treated alongside the suspected residue so that the results from each maybe directly compared. A fortified extract should also be included to prove that the reaction has proceeded in the presence of sample material. Interference may occur where derivatives are detected by means of properties of the derivatising reagent. A review of chemical reactions which have been used for confirmatory purposes has been published by Cochrane, W.P. (Chemical derivatisation in pesticide analysis, Plenum Press, NY (1981)). Chemical reactions have the advantages of being fast and easy to carry out, but specialised reagents may need to be purchased and/or purified.

(b) Physical reactions

A useful technique is the photochemical alteration of a pesticide residue to give one or more products with a reproducible chromatographic pattern. A sample of standard pesticide and fortified extract should always be treated in a similar manner. Samples containing more than one pesticide residue may give problems in the interpretation of results. In such cases pre-separation of specific residues may be carried out using TLC, HPLC or column fractionation prior to reaction.

(c) Other methods

Many pesticides are susceptible to degradation/transformation by enzymes. In contrast to normal chemical reactions, these processes are very specific and generally consist of oxidation, hydrolysis or de-alkylation. The conversion products possess different chromatographic characteristics from the parent pesticide and may be used for confirmatory purposes if compared with reaction products using standard pesticides.

4.9 THE CONCEPT OF LOWEST CALIBRATED LEVEL (LCL)

4.9.1 When the objective of the analysis is to monitor and verify the compliance with MRLs or other ALs, the residue methods must be sufficiently sensitive to reliably determine the residues likely to be present in a crop or an environmental sample at or around the MRL or AL. However, for this purpose it is not necessary to use methods with sufficient sensitivity to determine residues at levels two or more orders of magnitude lower. Methods developed to measure residues at very low levels usually become very expensive and difficult to apply. The use of LCL (see Glossary) would have the advantage of reducing the technical difficulty of obtaining the data and would also reduce costs. The following proposals for LCLs in various samples may be useful in enabling the residue chemist to devise suitable methods.

4.9.2 For active ingredients with agreed MRLs, the LCL can be specified as a fraction of the MRL. For analytical convenience this fraction will vary and could be as follows:

MRL (mg/kg)	LCL (mg/kg)
5 or greater	0.5
0.5 up to 5	0.1 increasing to 0.5 for higher MRLs
0.05 up to 0.5	0.02 increasing to 0.1 for MRLs
less than 0.05	0.5 x MRL

When the MRL is set at the limit of determination of the analytical method, the LCL will also be at this level.

4.10 EXPRESSION OF RESULTS

For regulatory purposes, only confirmed data should be reported, expressed as defined by the MRL. Null values should be reported as being less than lowest calibrated level, rather than less than a level calculated by extrapolation. Generally results are not corrected for recovery, and they may only be corrected if the recovery is significantly different from 100%. If results are reported corrected for recovery, then both measured and corrected values should be given. The basis for correction should also be reported. Where positive results obtained by replicate determinations (e.g. on different GC columns, with different detectors or based on different ions of mass spectra) of a single test portion (sub-sample), the lowest valid value obtained should be reported. Where positive results derive from analysis of multiple test portions, the arithmetic mean of the lowest valid values obtained from each test portion should be reported. Taking into account, in general, a 20-30% relative precision, the results should be expressed only with 2 significant figures (e.g.: 0.11, 1.1, 11 and $1.1x10^2$). Since at lower concentrations the precision may be in the range of 50%, the residue values below 0.1 should be expressed with one significant figure only.

Figure II.1. Overview of Method Validation

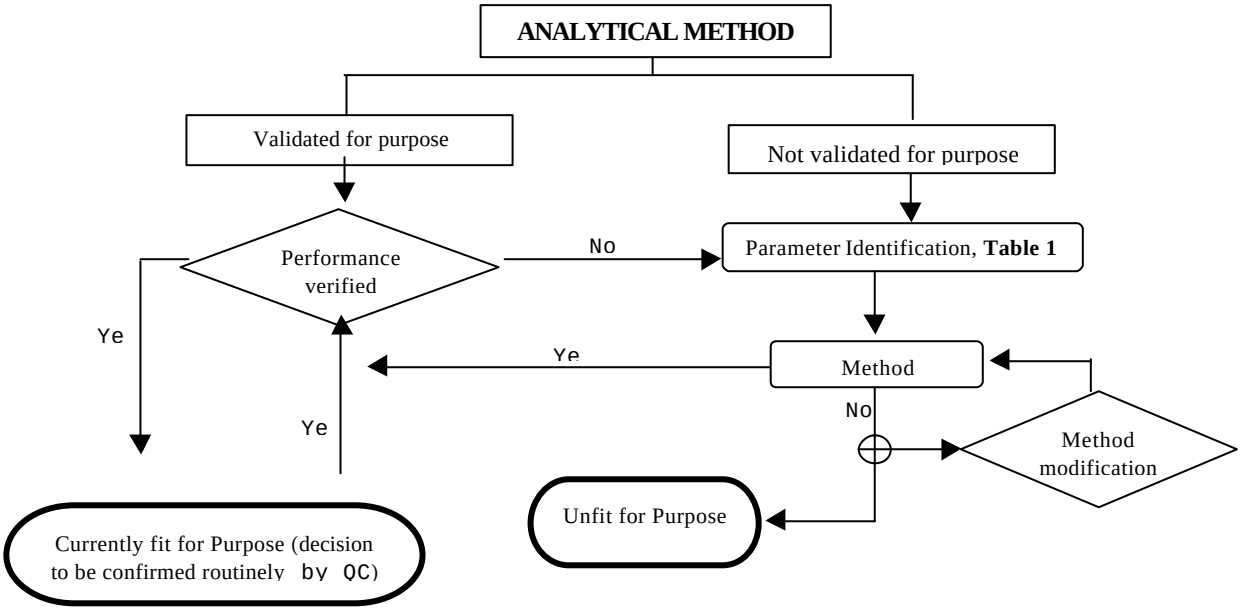

Figure II.2. Verification of Analyte Stability

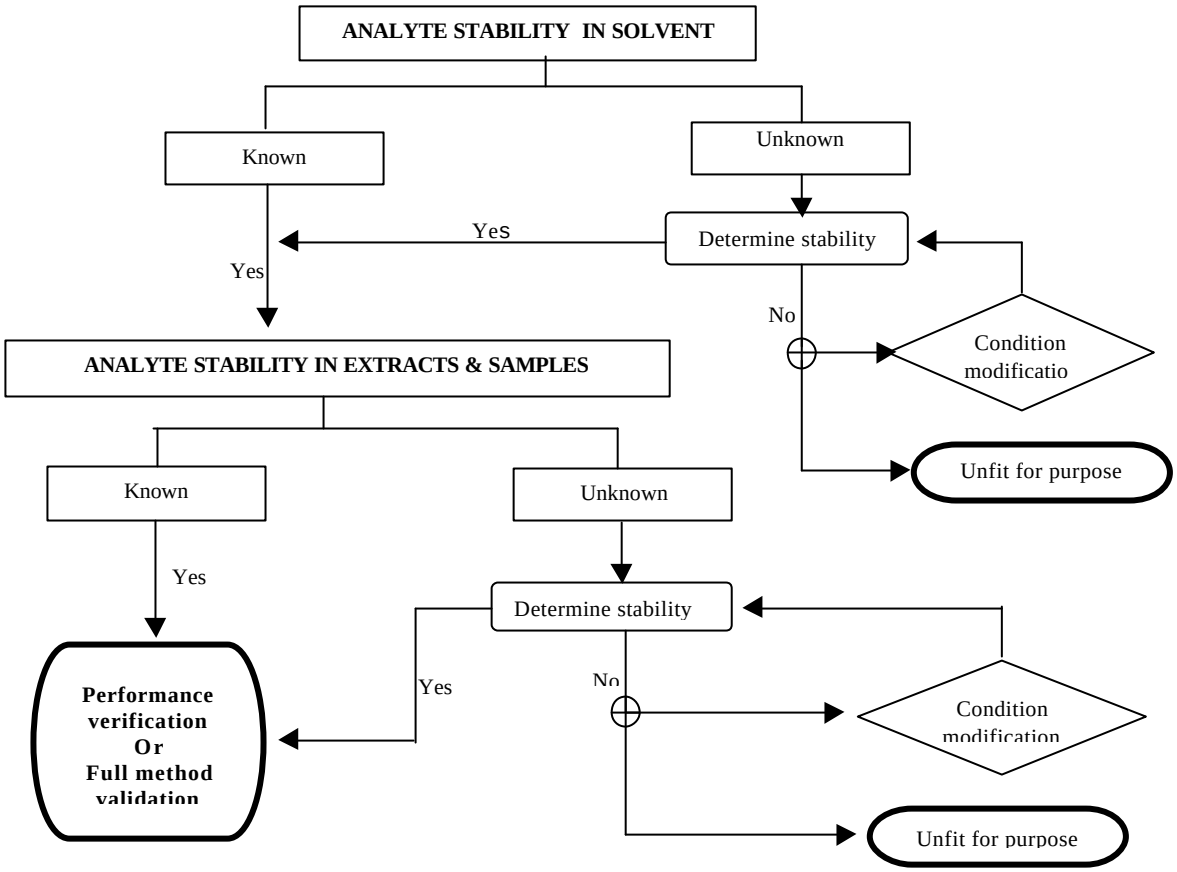

Table 1 Summary of parameters to be assessed for method validation

Parameters to be tested	Existing analytical method, for which previous tests of the parameter have shown that it is valid for one or more analyte/matrix combinations					Modification of an existing method	New method, not yet validated	Experiment types which may be combined
	Performance verification*	Additional matrix	Additional analyte	Much lower concentration of analyte	Another laboratory			
Specificity (show that the detected signal is due to the analyte, not another compound)	No (provided criteria for matrix blanks and confirmation of analyte are met)	Yes, if interference from matrix is apparent in QC	*Yes*	Yes, if interference from matrix is apparent in QC	Rigorous checks not necessary if the performance of the determination system is similar or better	Yes or No. Rigorous checks may be necessary if the determination system is fundamentally different or where the extent of interferences from the matrix is uncertain	Yes. Rigorous checks may be necessary if the determination system is different or where the extent of interferences from the matrices are uncertain, compared with existing methods	
Analytical Range, Recovery through extraction, clean-up, derivatisation and measurement	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Calibration range Analytical range LOD/LOQ Matrix effect
Calibration range for determination of analyte	No	No	Yes	Yes	Yes, for representative analytes	Yes, for representative analytes	Yes, for representative analytes	Linearity, reproducibility and signal/noise
LOD and LOQ	No	Yes, (partial if matrix is from a represented class)	Yes, partial for represented analytes	Yes	Yes	Yes	Yes	Lowest calibrated level, and low level spike recovery data
Reporting Limit, LCL	Yes	No	No	No	No	No	No	
Analyte stability in sample extracts* †	No	Yes, unless matrix is from a represented class	Yes, unless the analyte is represented	Yes	No	No, unless extraction/final solvent is different, or the clean-up is less stringent	Yes, if extraction/final solvent is different from that used in an existing method, or the clean-up is less stringent, compared with existing methods used.	

Parameters to be tested	Existing analytical method, for which previous tests of the parameter have shown that it is valid for one or more analyte/matrix combinations					Modification of an existing method	New method, not yet validated	Experiment types which may be combined
	Performance verification*	Additional matrix	Additional analyte	Much lower concentration of analyte	Another laboratory			
Analyte stability during sample storage*✪	Yes	Yes	Yes,	Ideally	No	No	No	
Extraction efficiency*◆	No	Ideally	Ideally	Ideally	No	No, unless different extraction conditions employed	Yes, unless previously tested extraction procedure is used.	
Homogeneity* of analytical samples	Yes✠	No, unless the matrix is substantially different	No	No	No, unless the equipment is changed	No, unless the equipment is changed	Yes, unless a previously tested sample processing procedure is used	See below
Analyte stability in sample processing*	No	Yes, unless a represented matrix	Yes, unless a represented analyte	Ideally	No	No, unless procedure involves higher temperature, longer time, coarser comminution, etc.	No, unless procedure involves higher temperature, longer time, finer comminution, etc. than validated procedures.	Repeatability, reproducibility

* On-going quality control

* If relevant information is not available

† Representative analytes may be chosen on the basis of hydrolysis, oxidation and photolysis characteristics

✪ Stability data in/on representative commodities should provide sufficient information. Additional tests are required, for example, where:

a samples are stored beyond the time period tested (eg. stability tested up to 4 weeks and measurable analyte loss occurs during this period, samples not analyzed until 6 weeks),

b stability tests were performed at ≤ -18 °C, but the samples are stored in the laboratory at ≤ 5 °C;

c samples are normally stored at ≤–15°C, but storage temperature rises to +5 °C).

◆ Information on efficiency of extraction may be available from the manufacturer or company that is registering the compound.

✠ Occasionally with repeated analysis of test portions of positive samples.

Table 2 Parameters to be assessed for method validation in various circumstances

Parameter	Level(s)	No. of analyses or type of test required		Criteria		Comments
			Quantitative method	Screening method		
1. Within-Laboratory (single laboratory) performance of optimised method						
1.1 Analyte stability in extracts and standard solutions	At ≤AL, or with well detectable residues	≥5 replicates at each appropriate point in time (including zero) and for each representative analyte/commodity. Fortify blank sample extracts to test stability of residues. Compare analyte concentration in stored and freshly made standard solutions.	No significant change in analyte concentration in stored extracts and analytical standards ($P = 0.05$)	At the end of the storage period, residues added at LCL are detectable		The test of stability in extracts is required if the analytical method is suspended during the determination process, and the material will likely be stored longer than during determination of precision, or if low recoveries were obtained during optimisation of the method. During method optimisation, recovery should be measured against both "old" and "freshly prepared" calibration standards, if the recovery extracts are stored. Storage time should encompass the longest period likely to be required to complete the analysis.
1.2 Calibration function Matrix effect	LCL to 2 (3) times AL	Test the response functions of all analytes included in the method with ≥2 replicates at ≥3 analyte levels plus blank sample. For non-linear response, determine response curve at ≥7 levels and ≥3 replicates. Test the matrix effect with all representative analytes and matrices. Apply the standards prepared in solvent and sample extracts randomly.	For linear calibration: regression coefficient for analytical standard solutions (r) ≥ 0.99, the SD of residuals ($S_{y/x}$) ≤ 0.1 For polynomial function (r) ≥ 0.98. The matrix effect is confirmed if the difference is significant at $P = 0.05$.	For linear calibration: regression coefficient (r) ≥ 0.98. SD of residuals ≤ 0.2 For polynomial function (r) ≥ 0.95		Calibration parameters may be established during optimisation of the procedure, determination of precision or detection capability. Prepare calibration solutions of different concentrations For MRM perform calibration with mixtures of analytes ("standard mixture"), which can be properly separated by the chromatographic system. Use matrix matched analytical standards for further tests if matrix effect is significant. The method validation may not give definite information for the matrix effect, because matrix effects change with time, with sample (sometimes), with column, etc.
1.3 Analytical range,	LCL to 2 (3) times AL*	Analyse representative analyte matrix combinations: ≥ 5 analytical portions spiked at zero, LCL, AL	LOQ should be fit for purpose. Mean recovery and CV_A	All recoveries are detectable at LCL		The analysts should demonstrate that the method is suitable for determining the presence of the analyte at the appropriate AL

Parameter	Level(s)	No. of analyses or type of test required		Criteria		Comments
			Quantitative method	Screening method		
accuracy, trueness precision, limit of detection (LD), limit of quantitation (LOQ)		and ≥3 replicates at 2-3 AL level. The recovery tests should be divided among the analysts, who will use the method, and instruments that will be involved in the analysis.	see Table 3. Mean residue* measured in reference material is not significantly different from the consensus value (P = 0.05).			with the maximum (false negative and false positive) errors specified. For MRM, the fortification level of blank samples should cover the ALs of analytes represented. Consequently they may not correspond with the actual AL for the representative analytes. Fortify analytical portions with standard mixtures. The accuracy and precision ranges determined for representative analyte/matrix combinations can be considered typical for the method, and will be used as applicability criteria for extension to new analytes and commodities, as well as initial guidance for internal quality control of the method. Report uncorrected results, mean recovery and CV_A of replicates. CV_A is equivalent to the within laboratory reproducibility of analysis of samples. * Correct the results for mean recovery if it is significantly different from 100 %. Where the method does not permit recovery to be estimated, accuracy and precision are those of calibration.
1.4 Specificity and selectivity of analyte detection	At lowest calibration level (LCL)	Identify by mass spectrometry, by a similarly specific technique, or by the appropriate combination of separation and detection techniques available. Analyse ≥5 blanks of each representative commodity obtained preferably from different sources, Report analyte	Measured response is solely due to the analyte. Residues measured on two different columns should be within the critical range of replicate chro-matographic determinations.	The rate of false negative samples (β error) at AL should typically be < 5%.		Applies only to a specific combination of separation and detection technique. Samples of known treatment history may be used instead of untreated samples, for analytes other than that applied during treatment. Maturity of sample matrices may significantly affect the blank sample response. Blank values shall also be regularly checked during performance verification (see Section 4 below).

Parameter	Level(s)	No. of analyses or type of test required		Criteria		Comments
			Quantitative method	Screening method		
		equivalent of blank response. Determine and report selectivity (δ) of detector and relative response factors (RRF) of representative analytes with specific detectors used..				Report typical peaks present in the extracts of blank samples. The LCL should preferably be ≤ 0.3AL, except when the AL is set at or about the limit of quantitation. The test may be performed in combination with the determination of decision limit and detection capability and will also provide information for the relative RRts and RRFs of compounds. Alter chromatographic conditions if blank sample response interfere with the analyte or use an alternative detection system. Suitable combination of selective detectors increases specificity, because the amount of information about the analyte is increased.
1.5 Selectivity of separation	At AL	Determine RRt values for all analytes to be tested by the method (not only the reference compounds). When chromatographic techniques are used without spectrometric detection, apply different separation principles and/or determine RRt-s on columns of different polarity. Determine and report resolution (R_S) and tailing factors (T_f) of critical peaks.	The nearest peak maximum should be separated from the designated analyte peak by at least one full width at 10% of the peak height, or more selective detection of all analytes is required.	Tentative identification of all analytes tested. (Not all analytes need to be separated)		Unless the chromatographic separation and spectrometric detection is used in combination, report RRt values on columns of different polarity, which enable the separation (minimum R≥ 1.2) of all analytes tested. The test may be combined with the determination of calibration function and matrix effect (see. 1.7)
1.6 Homogeneity of analyte in analytical sample	At about AL or well detectable residues	Analyse ≥5 replicate test sample portions of one representative commodity from each group (Table 5), post-processing. Determine CV_{Sp} with analysis of variance. The analyte homogeneity should be checked with analytes known to be stable.	$CV_{Sp} \leq 10\%$.	$CV_{Sp} \leq 15\%$ For screening methods it may be desirable to take a portion in which residues can be expected to be highest (e.g. citrus peel) and achievement of homogeneity may be unnecessary.		Use preferably commodities with incurred stable surface residues or treat the surface of a small portion of the natural units (<20%) of laboratory sample before cutting or chopping to represent worst scenario of sample processing. Processing validated for use with any subsequent procedure. Validation applicable to other commodities with similar physical properties, and it is independent of the analyte. The test

Parameter	Level(s)	No. of analyses or type of test required		Criteria		Comments
			Quantitative method	Screening method		
						may be combined with testing stability of analyte (see Section 1.7 of this Table) Determine the sampling constant[3,4] to calculate the size of analytical portion required to satisfy quality criteria of $CV_{Sp} \leq 10\%$ specified. The CV_{Sp} may not need to be determined separately if the CV_L of the incurred residues are within the limits specified in Table 2.
1.7 Analyte stability during sample processing	About AL	Fortify commodities with known amounts of analytes before processing the sample. Analyse ≥5 replicates of each commodity, post-processing, Apply a stable marker compound together with the analytes tested For MRM and group specific methods, GSM, several analytes, which can be well separated, can be tested together.	The stability of the analyte need not be specified if the average overall recovery of analyte added before sample processing (including procedural recovery) and CV_A are within the ranges specified in Table 3. Quantify stability if the overall recovery and the procedural recovery is significantly different (P=0.05).	Analyte added at LCL remains detectable after processing		The temperature of the sample during processing may be critical. Processing validated for use with any subsequent procedure. Validation may be specific to analyte and/or sample matrix. For testing stability determine the mean recovery and CV_L of labile and stable marker compounds. Use these compounds for internal QA tests (see section 4). Express the ratio of average concentration of labile and stable compounds to indicate stability of residues. CV's of stable compounds will indicate the within laboratory repeatability as well.
1.8 Extraction efficiency	About AL or readily measurable residues	Analyse ≥5 replicate portions of samples or reference material with incurred residues. Compare the reference (or different) procedure with that under test. For MRM the analytes tested should preferably have a wide range of Pow values. Only to be determined using incurred residues.	For samples with incurred residues, the mean result obtained with the reference procedure and the tested procedure should not differ significantly at P=0.05 level applying CV_L in the calculation. Or, the consensus value of reference material and the mean residue should not	The mean incurred residues, known to be present at or about the LOQ or LCL, are actually detectable in the samples.		Temperature of the extract, speed of blender or Ultra Turrax, time of extraction and solvent/water/matrix ratio may significantly affect the efficiency of extraction. The effect of these parameters can be checked with ruggedness test. The optimised conditions should be kept constant as far as possible. Validation is generally applicable for commodities within one group and represented analytes of similar physical and chemical

[3] Wallace, D. and Kratochvil, B., Analytical Chemistry, **59**, 1987, 226.
[4] Ambrus, A., Solymosné, E.M. and Korsós, I., J. Environ. Sci. and Health, **B31**, 1996, 443.

Parameter	Level(s)	No. of analyses or type of test required		Criteria		Comments
			Quantitative method	Screening method		
			differ significantly at P=0.05 level when calculated with CV_A of the method tested. When the CV_A of the method is larger than 10%, the number of replicate analyses has to be increased to keep the relative standard error of the mean < 5%. Otherwise quantify and report the efficiency of extraction (excluding the recovery of analytical phase following the extraction).			properties. Validation is independent from subsequent procedures in the method. The average recovery of each method shall be determined from spiked analytical portions. Correct results with average recovery of analysis if it is significantly different from 100%. According to some regulations the ability of screening kits should be tested to detect a positive at 95% confidence.
1.9 Analyte stability during sample storage	About AL	Analyse freshly homogenised samples containing incurred residues, or homogenise and spike blank samples (time 0), and then analyse samples stored according to normal procedures of the laboratory (usually at ≤ -18 °C). The storage time should be ≥ than the longest interval foreseen between sampling and analysis. ≥5 replicates at each time point. When the stored portions are analysed ≥ 4 occasions, test ≥2 spiked portions, and ≥ 1 blank portion spiked at the time of analysis. Analytical portions should be thawed only	No significant loss of analyte during storage (P = 0.05)	Analyte added at lowest calibration level, LCL, remains detectable after storage		Storage is validated for use with any subsequent procedure. Validation is specific to analyte. However, generally storage stability data obtained with representative sample matrices can be considered valid for similar matrices. The matrices shall be selected taking into account the chemical stability (e.g. hydrolysis) of the analyte and the intended use of the substance. Useful information can be obtained on stability during storage from the JMPR evaluations[5] or from dossiers submitted for registration Report the initial residue concentration, the remaining residue concentration and the procedural recovery of the analyte. Unnecessary sample storage can be avoided by a careful planning for sampling and consequent analysis through administrative arrangement,

[5] FAO, Pesticide Residues in Food – Evaluations; published annually in the series of FAO Plant Production and protection Papers

Parameter	Level(s)	No. of analyses or type of test required		Criteria		Comments
			Quantitative method	Screening method		
		immediately before or during extraction.				which is not a part of analytical method.
2. Extension of the validated method						
2.1 Analyte stability during sample storage, processing, and in extracts and standard solutions.	See 1.1, 1.2 & 1.9					Only if information on stability under the processing conditions and on the representative matrix is not already available
2.2 Calibration function, matrix effect	LCL to 2 (3) AL:	Three point calibration embracing AL with and without matrix matched analytical standards	For linear calibration: regression coefficient for analytical standard solutions (r) ≥ 0.99. SD of relative residuals ($S_{y/x}$) ≤ 0.1 For polynomial function (r) ≥ 0.98.	For linear calibration: regression coefficient (r) ≥ 0.98. SD of relative residuals ≤ 0.2 For polynomial function (r) ≥ 0.95.		The method validation may not give definite information for the matrix effect, because matrix effects change with time, with sample (sometimes), with column, etc.
2.3 Accuracy, precision, LD, LOQ	at AL	Planned in advance: (a) Analyse 3 analytical portions of representative sample matrices of interest fortified at AL Unexpectedly found: Fortify 2 preferably 3 additional portions of analytical sample approximately at the level of the new analyte. Calculate the recovery of added analyte. Use similar sample matrix for recovery test if appropriate amount of analytical sample is not available..	The residues recovered should be within the repeatability limits of the method: Three portions: $C_{max} - C_{min} \leq 3.3 CV_{Atyp} Q$ Two portions: $C_{max} - C_{min} \leq 2.8 * CV_{Atyp} Q$ CV_{Atyp} is the typical repeatability coefficient of variation of the method to be adapted. Q =average recovery of the new analyte, and it shall comply with Table 3.	Analytes added to blank samples at target reporting level should be measurable in all tests.		Use CV_{Atyp} established during method validation. The method should only be tested with commodities representing the intended use (possible misuse) of the analyte.
2.4 Specificity	At LCL	Identify by mass spectrometry, or	Measured response is	The rate of false negative		When the extension for a new analyte is

Parameter	Level(s)	No. of analyses or type of test required		Criteria		Comments
			Quantitative method	Screening method		
and selectivity of analyte detection		by the appropriate combination of separation and detection techniques available. Planned in advance: (a) Analyse one representative blank sample from each commodity group of interest (in which the new analyte is likely to be present). Analyse new matrix with representative compounds. Unexpectedly found: (b) Check response of blank sample (if available), or demonstrate that the response measured corresponds solely to the analyte, using the best technique available in the laboratory. Check δ and RRF of detection and RRts of representative analytes. Compare RRt and response of new analyte with other analytes tested during method validation and with blank responses obtained during extension of the method and the prior validation of the method.	solely due to the analyte. The detection system used should have equal or better detector performance than those applied during method validation. Residues measured on two different columns should be within the critical range of replicate chro-matographic determinations. Relative retentions of representative analytes obtained during method validation and measured should be within 2 % for GLC and 5 % for HPLC determinations.	samples (β error) at AL should be < 5%.		planned, the applicability of the method shall be checked for all representative sample matrices in which the analyte may occur. When an analyte is unexpectedly detected, the performance check may be carried out for the actual matrix alone See also 1.4. The responses of blank sample(s) should not interfere with the analytes, which are likely to be measured in the sample. Report typical peaks present in blank extracts. The background noise of a new matrix extract should be within the range obtained for representative commodities/sample matrices. If the selectivity of detection does not eliminate the matrix response, use appropriate combination of chromatographic columns that enable the separation of analytes from the matrix peaks. See other options in Table 6.
2.5 Selectivity of separation	See 1.5	See 1.5	See 1.5	See 1.5		See 1.5 Only if information is not available
2.6 Extraction efficiency	See 1.8	See 1.8	See 1.8	See 1.8		See 1.8 Only if information is not available
3. Adaptation of the validated method in another laboratory						

Parameter	Level(s)	No. of analyses or type of test required		Criteria		Comments
			Quantitative method	Screening method		
3.1 Purity and suitability of chemicals, reagents and ad(ab)sorbents		Test reagent blank, applicability of ad(ab)sorbents and reagents. Perform derivatization without and with sample.	No interfering response above 0.3 LCL.	No interfering response above 0.5 AL		Some of the most common problems in method transfer involve differences in selection of reagents, solvents and chromatographic media, or in equipment capabilities. Whenever possible, try to confirm actual materials and equipment used by the method developer, if that information is not provided with the method or publication, as received. Substitutions can be tried after the method is working within your laboratory.
3.2 Analyte stability in extracts and standard solutions	See 1.10	See 1.1	See 1.1	See 1.1		This testing may be omitted if full information on analyte stability is provided with the method or if the method is replacing a previously used method for the analyte and the stability information has been previously generated for the previous method.
3.3 Calibration function Matrix effect	LCL to 2 (3) times AL	Test the response functions of representative analytes included in the method at ≥3 analyte levels plus blank. For non-linear response, determine response curve at≥7 levels and ≥3 replicates. Test the matrix effect with representative analytes and matrices.	For linear calibration: regression coefficient for analytical standard solutions (r) ≥ 0.99. The SD of relative residuals ($S_{y/x}$) ≤ 0.1 For polynomial function (r) ≥ 0.98.	For linear calibration: regression coefficient (r) ≥ 0.98. The SD of relative residuals ≤ 0.2 For polynomial function (r) ≥ 0.95.		Sees: 1.2
3.4 Analytical range accuracy and precision, limit of detection, limit of quantitation	Blank extract and or AL	Analyse representative analyte/matrix combinations: ≥ 5 analytical portions each of blank samples spiked at 0 and AL, and 3 portions spiked at 2 AL. The recovery tests should be divided among the analysts, who will use the method, and instruments that will be involved	Average recovery and CV_A should be within the ranges given in Table 3.	All recoveries detectable at LCL. Reference materials at AL: analyte detected.		See comments in 1.3.

Parameter	Level(s)	No. of analyses or type of test required		Criteria		Comments
			Quantitative method	Screening method		
		in the analysis.				
3.5 Specificity and selectivity of analyte detection	At AL	Check performance characteristics of detectors used and compare them with those specified in the method. Check response of one blank of each representative commodity, otherwise perform test as described in section 1.4.	Measured response is solely due to the analyte. The detector performance (sensitivity and selectivity) should be equal or better than specified in the method. See section 1.4	The rate of false negative samples (β error) at AL should typically be < 5%.		The relative response of specific detectors can substantially vary from model to model. Proper checking of specificity of detection is critical for obtaining reliable results. Compare blank response observed with typical peaks reported in blank extracts See other comments under section 1.4.
3.6 Analyte "homogeneity"	At about AL or well detectable residues	Test two representative commodities of different nature	CV_{Sp}<10%	CV_{Sp}<15% For screening methods it may be desirable to take a portion in which residues can be expected to be highest (e.g. citrus peel) and achievement of homogeneity may be unnecessary.		The tests are performed to confirm similarity of application conditions and applicability of parameters obtained by the laboratory validating the method. When the test results in similar CV_{Sp} as reported, the conditions of sample processing may be considered similar and further tests are not required for the validation of the method.
3.7 Analyte stability in extracts and standard solutions	See 1.1	See 1.1	See 1.1	See 1.1		This testing may be omitted if full information on analyte stability is provided with the method or if the method is replacing a previously used method for the analyte and the stability information has been previously generated for the previous method.

Table 3. Within Laboratory Method Validation Criteria for Analysis of pesticide residues

Concentration	Repeatability		Reproducibility		Trueness[2,]
	CV_A% [3]	CV_L%[4]	CV_A% [3]	CV_L%[4]	Range of mean % recovery
≤1 µg/kg	35	36	53	54	50–120
> 1 µg/kg ≤ 0.01 mg/kg	30	32	45	46	60–120
> 0.01 mg/kg ≤ 0.1 mg/kg	20	22	32	34	70–120
> 0.1 mg/kg ≤ 1 mg/kg	15	18	23	25	70–110
> 1 mg/kg	10	14	16	19	70–110

1. With multi-residue methods, there may be certain analytes where these quantitative performance criteria cannot be strictly met. The acceptability of data produced under these conditions will depend on the purpose of the analyses e.g. when checking for MRL compliance the indicated criteria should be fulfilled as far as technically possible, while any data well below the MRL may be acceptable with the higher uncertainty.
2. These recovery ranges are appropriate for multi-residue methods. Stricter criteria may be necessary for some purposes e.g. methods for single analytes or veterinary drug residues (see Codex V3, 1996).
3. CV_A: Coefficient of variation for analysis excluding sample processing. The parameter can be estimated from tests performed with reference materials or analytical portions spiked before extraction. A reference material prepared in the laboratory may be used in the absence of a certified reference material.
4. CV_L: Overall coefficient of variation of a laboratory results, including up to 10% variability of residues between analytical portions (CV_{Sp}). Note: the variability of residues in between analytical portions can be calculated from the uncertainty of the measurement of replicate portions of samples (CV_L) containing residues; $CV_L^2 = CV_{Sp}^2 + CV_A^2$.

Table 4 Requirements for performance verification

Parameter	Level(s)	No. of analyses or type of test required		Criteria	Comments
			Quantitative method	Screening method	
4. Quality control (performance verification)					
4.1 Methods used regularly					
4.1.1 Suitability of chemicals, adsorbents and reagents		For each new batch: Test reagent blank, applicability of ad(ab)sorbents and reagents Perform derivatization without sample.	No interfering response ≥0.3 LCL.	No interfering response ≥ 0.5AL.	Alternately, if the sample blank, calibration and the recovery are satisfactory then the suitability of reagents etc. are confirmed.
4.1.2 Calibration and analytical range		Single point calibration may be used with standard mixtures, if the intercept of calibration function is close to 0. Apply multi point calibration (3x2) for quantitative confirmation.	The analytical batch may be considered to be under statistical control if the analytical standards and sample extracts are injected alternately, and the calculated SD of relative residuals is ≤0.1.	Analyte is detected at LCL.	Standard solution and samples should be injected alternately. Bracketing with appropriate standard injections may provide a time saving alternative to multi point calibration especially if auto sampler is not available. As system response often changes multi point calibration shall be performed regularly to confirm that the intercept is close to zero. Multi point calibration is not necessary for quantitative confirmation if the calibrant is very close in concentration to that of the sample.
4.1.3 Accuracy and precision	Within analytical range	Include in each analytical batch ≥1 sample either fortified with standard mixture, or the reanalysis of a replicate portion of a positive sample.	The performance of detector and chromatographic column shall be equal or better than specified in the method. Preferably all recoveries should be within the warning limit of control chart constructed according to section 4.5.2. On a long run one of every 20 or 100 samples may be outside the warning and action limits, respectively. The analytical batch should be repeated if any of the recoveries falls outside the action limits, or the results of the replicate analyses of the positive sample exceeds the critical range. $C_{max} - C_{min} > 2.8 * CV_{Ltyp} Q$ Q is the average residue obtained from the replicate measurements, the CV_{Ltyp} is the measure of within laboratory reproducibility, which includes the combined uncertainty of sample processing and analysis.		*Fortify analytical portion with standard mixture(s). Alter standard mixtures in different batches to obtain recoveries for all analytes of interest at regular intervals. Perform alternately recovery studies at AL as well as at LCL and 2 times AL, as appropriate, to confirm applicability of the method within the analytical range. The frequency of recovery studies at AL should be 2 to 3 times higher then those at other levels.* Repeated analysis of positive samples may replace the recovery test in a particular batch. For MRM prepare commodity/sample specific standard mixtures from the analytes which may occur in a particular sample. The selection of analytes for one mixture should assure selective

					separation/detection without any problem. For tentative identification: prepare analytical batches containing the appropriate detection test mixture, and samples. For quantitative determination/confirmation include in the analytical batch the detection test mixture, appropriate number of calibration mixtures, fortified blank sample(s), or one repeated positive sample and the new positive samples Inject standards and samples alternately.
4.1.4 Selectivity of separation, Specificity of detection Performance of detectors		Include appropriate detection test mixture in each chromatography batch. Include untreated commodity (if available) in analytical batch. Use standard addition if no untreated sample (similar to those analysed in the batch) is available Confirm identity and quantity of each analyte present ≥0.7 AL level.	R_s, T_f of test compounds, and RRF and δ of the detection should be within the specified range. Relative retention should be within 2 % for GLC and 5 % for HPLC determinations. Detector performance should be within specified range. Sample co-extractives interfering with the analyte should not be present ≥ 0.3 LCL. The recovery of added standard should be within the acceptable recovery range of the analyte.	Detector performance should be within specified range. Analyte should be seen above LCL or CCα for banned compounds.	This is also sometimes referred to as a "system suitability" test. Prepare detection test mixture for each method of detection. Select the components of the mixture in order to indicate the characteristic parameters of chromatographic separation and detection. Adjust RRt database for the compounds of detection test mixture and analytes used for calibration. Define the RRF specific for the detection system. Perform quantitative confirmation with analytical standards prepared in blank matrix extract if matrix effect is significant.
4.1.5 Analyte homogeneity in processed sample	At well detectable analyte concentration.	Select a positive sample randomly. Repeat analysis of another one or two analytical portions.	The residues measured on two different days should be within the reproducibility limit of replicate analytical portions: $C_{max} - C_{min} \leq 2.8 * CV_{Ltyp} Q$ Q is the average residue obtained from the replicate measurements, the CV_{Ltyp} is the combined uncertainty of sample processing and analysis obtained during method validation.		Perform test alternately to cover each commodity analysed. Test homogeneity at the beginning of growing season, or at the start of the analysis of the given type of samples. The acceptable results of the test also confirm that the reproducibility of the analyses (CV_A) was appropriate.
4.1.6 Extraction					The efficiency of the extraction cannot be controlled during the analysis. To ensure

efficiency					appropriate efficiency, the validated extraction procedure should be carried out without any change.
4.1.7 Duration of analysis			The samples, extracts etc. should not be stored longer than the period for which the storage stability was tested during method validation. Storage conditions should be regularly monitored and recorded.		Examples for the need of additional storage stability tests are given under Table 1.
4.2 Analyte detected occasionally					
Follow tests described in 4.1 with the following exceptions					
4.2.1Accuracy and precision	At around AL	Reanalyse another analytical portion; Use standard addition at the measured level of analyte.	The residues measured on two different days should be within the critical range: $C_{max} - C_{min} \leq 2.8 * CV_{Ltyp} Q$ Q is the average residue obtained from the replicate measurements, the CV_{Ltyp} is obtained during method validation. The recovery following standard addition shall be within action limits.		Check accuracy if residue found at ≥0.5AL.
4.3 Methods used at irregular intervals					
Follow tests described in 4.1 with the following exceptions					
4.3.1 Accuracy and precision (repeatability)	At AL and LCL	Include one fortified sample at LCL and two samples at AL in each analytical batch. Use standard addition if untreated sample (similar to those analysed in the batch) is not available. Perform analysis with ≥2 analytical portions.	Minimum two recoveries shall be within warning limit, one may be within action limit. The residues measured in replicate portions should be within the critical range: $C_{max} - C_{min} \leq 2.8 * CV_{Ltyp} Q$ or $C_{max} - C_{min} \leq f_{(n)} * CV_{Ltyp} Q$ Q is the average residue obtained from the replicate measurements, the CV_{Ltyp} is obtained during method validation, $f_{(n)}$ is the factor for calculation of extreme range depending on the number of replicate samples.		The acceptable results also prove the suitability of chemicals, adsorbents and reagents used. Confirm residues above 0.5AL. If performance criteria were not satisfied, the method shall be practised and its performance characteristics (Q, CV_{Atyp}, CV_{Ltyp}) re-established during partial revalidation of the method.
4.4. Changes in implementation of the method					
Change	Parameters to be tested		**For test methods and acceptability criteria see the appropriate sections of Appendix 1**.		
4.4.1 Chroma-tographic column	Test selectivity of separation, resolution, inertness, RRt values.		Performance characteristics should not be affected		Apply appropriate test mixtures to obtain information on the performance of the column.
4.4.2 Equipment for sample processing	Homogeneity of processed sample; Stability of analytes.		Test described in 1.6 and 1.7 shall be performed and they should give results conforming to the relevant criteria..		Homogeneity test is only necessary if the degree of comminution and/or mixing is inferior to that of the original equipment. The stability of analytes needs to be tested if the processing time and temperature are significantly increased.

4.4.3 Equipment for extraction	Compare field incurred residue levels detected with the old and new equipment in ≥ 5 replicates	The mean residues should not be significantly different at p=0.05 level.	Test is necessary if a new type of equipment is used
4.4.4 Detection	Test selectivity of separation and selectivity and sensitivity of detection	Performance characteristics should be the same or better specified in the description of the method.	Test also detectability separately with new detection reagents.
4.4.5 Analyst	≥5 recovery tests at each level (LCL, AL and 2 (3) AL), re-analysis of one blank sample and two positive samples (unknown to the analyst)	All results should be within the warning limits specified for the method in the laboratory. Replicate sample analysis shall be within the critical range.	This is a minimum requirement. Laboratories in some areas of residue work use a more detailed protocol which includes: (1) generation of standard curve within acceptability criteria; (2) minimum of 2 analytical runs for each matrix, containing representative analytes fortified by the analyst at a minimum of 3 levels in duplicate; (3) minimum of 1 analytical run containing fortified or incurred samples, 3 levels in duplicate, provided as unknowns to the analyst. All results must meet acceptability criteria, or be repeated.
4.4.6 Laboratory	Accuracy and precision ≥3 recovery tests at each level (LCL, AL and 2 (3) AL) by (different) analyst(s) on different days.	All results should be within the warning limits specified for the method in the laboratory.	The reproducibility of the method under the new conditions must be established and it has to be done by more than one analyst if available.

Table 5. Representative commodities/samples for validation of analytical procedures for pesticide residues

Commodity Group	Common properties	Commodity class[6]	Representative species
Plant products			
I.	High water and chlorophyll content	Leafy vegetables Brassica leafy vegetables Legume vegetables	spinach or lettuce broccoli, cabbage, kale green beans
II.	High water and low or no chlorophyll content	Pome fruits Stone fruits Berries Small fruits Fruiting vegetables Root vegetables	apple, pear peach, cherry Strawberry grape, tomato, bell pepper, melon mushroom potato, carrot, parsley
III.	High acid content	Citrus fruits	orange, lemon
IV.	High sugar content		raisins, dates
V.	High oil or fat	Oil seeds Nuts	avocado, sunflower seed walnut, pecan nut, pistachios
VI.	Dry materials	Cereals	wheat, rice or maize grains
		Cereal products	wheat bran, wheat floor
	Commodities requiring individual test		e.g. garlic, hops, tea, spices, cranberry
Products of animal origin			
		Meats	Cattle meat, chicken meat
		Edible offals	Liver, kidney
		Fat	Fat of meat
		Milk	Cow milk
		Eggs	Chicken egg

Note: The method should be validated with representative pesticides for each commodity group. Commodities which are difficult to analyse require individual tests.

6 Codex Alimentarius, Volume 2, 2nd ed., Pesticide Residues in Food, pp. 147-365, FAO, 1993

Table 6. Examples of detection methods suitable for the confirmatory analysis of substances

Detection method	**Criterion**
LC or GC and Mass spectrometry	if sufficient number of diagnostic ions are monitored
LC-DAD or scanning UV	if the UV spectrum is characteristic
LC – fluorescence	in combination with other techniques
2-D TLC – (spectrophotometry)	in combination with other techniques
GC-ECD, NPD, FPD	only if combined with two or more separation techniques[1]
Derivatisation	if it was not the first choice method
LC-immunogram	in combination with other techniques
LC-UV/VIS (single wavelength)	in combination with other techniques

1. Other chromatographic systems (applying stationary and/or mobile phases of different selectivity) or other techniques.

Glossary of terms

Accepted Limit (AL)	Concentration value for an analyte corresponding to a regulatory limit or guideline value which forms the purpose for the analysis, e.g. MRL, MPL; trading standard, target concentration limit (dietary exposure assessment), acceptance level (environment) etc. For a substance without an MRL or for a banned substance there may be no AL (effectively it may be zero or there may be no limit) or it may be the target concentration above which detected residues should be confirmed (action limit or administrative limit).
Accuracy	Closeness of agreement between a test result and the accepted reference value.
Alpha (a**) Error**	Probability that the true concentration of analyte in the laboratory sample is less than a particular value (e.g. the AL) when measurements made on one or more analytical/test portions indicate that the concentration exceeds that value (false positive). Accepted values for this probability are usually in the range 1 to 5%.
Analyte	The chemical substance sought or determined in a sample.
Analyte Homogeneity (in sample)	Uniformity of dispersion of the analyte in matrix. The variability in analytical results arising from sample processing depends on the size of analytical portion. The sampling constant[7] describes the relationship between analytical portion size and the expected variation in a well mixed analytical sample: $K_S = w (CV_{Sp})^8$, where w is the mass of analytical portion and CV_{Sp} is the coefficient of variation of the analyte concentration in replicate analytical portions of w [g] which are withdrawn from the analytical sample
Analytical portion	A representative quantity of material removed from the analytical sample, of proper size for measurement of the residue concentration.
Analytical sample	The material prepared for analysis from the laboratory sample, by separation of the portion of the product to be analysed and then by mixing, grinding, fine chopping, etc., for the removal of analytical portions with minimal sampling error.
Applicability	The analytes, matrices and concentrations for which a method of analysis has been shown to be satisfactory.
Beta (b**) Error**	Probability that the true concentration of analyte in the laboratory sample is greater than a particular value (e.g. the AL) when measurements made on one or more analytical portions indicate that the concentration does not exceed that value (false negative). Accepted values for this probability are usually in the range 1 to 5%.
Bias	Difference between the mean value measured for an analyte and an accepted reference value for the sample. Bias is the total systematic error as contrasted to random error. There may be one or more systematic error components contributing to the bias. A larger systematic difference from the accepted reference value is reflected by a larger bias value.
Commodity Group	Group of foods or animal feeds sharing sufficient chemical characteristics as to make them similar for the purposes of analysis by a method. The characteristics may be based on major constituents (e.g. water, fat, sugar, and acid content) or biological relationships, and may be defined by regulations.

[7] Wallace, D. and Kratochvil, B., Analytical Chemistry, 59, 226-232, 1987

[8] Ambrus, A., Solymosné, E.. and Korsós, I. J. Environ. Sci. Health, B31, (3) 1996

Confirmatory Method	Methods that provide complete or complementary information enabling the analyte to be identified with an acceptable degree of certainty [at the Accepted Limit or level of interest]. As far as possible, confirmatory methods provide information on the chemical character of the analyte, preferably using spectrometric techniques. If a single technique lacks sufficient specificity, then confirmation may be achieved by additional procedures consisting of suitable combinations of clean-up, chromatographic separation(s) and selective detection. Bioassays can also provide some confirmatory data. In addition to the confirmation of the identity of an analyte, its concentration shall also be confirmed. This may be accomplished by analysis of a second test portion and/or re-analysis of the initial test portion with an appropriate alternative method (e.g. different column and/or detector). The qualitative and quantitative confirmation may also be carried out by the same method, when appropriate.
Decision Limit (CCα)	Limit at which it can be decided that the concentration of the analyte present in a sample truly exceeds that limit with an error probability of α (false positive). In the case of substances with zero AL, the CCα is the lowest concentration level, at which a method can discriminate with a statistical probability of 1 - α whether the identified analyte is present. The CCα is equivalent to the limit of detection (LOD) under some definitions (usually for α = 1%). In the case of substances with an established AL, the CCα is the measured concentration, above which it can be decided with a statistical probability of 1 - α that the identified analyte content is truly above the AL.
Detection Capability (CCß)	Smallest true concentration of the analyte that may be detected, identified and quantified in a sample with a beta error (false negative). In the case of banned substances the CCβ is the lowest concentration at which a method is able to determine the analyte in contaminated samples with a statistical probability of 1 – ß. In the case of substances with an established MRL, CCβ is the concentration at which the method is able to detect samples that exceed this MRL with a statistical probability of 1 - ß. When it is applied at the lowest detectable concentration, this parameter is intended to provide equivalent information to the Limit of Quantitation (LOQ), but CCβ is always associated with a specified statistical probability of detection, and therefore it is preferred over LOQ..
Detection Test Mixture	Mixture of analytical standards which are suitable to check the conditions of chromatographic separation and detection. The detection test mixture should contain analytes which provide information for the selectivity and response factors for the detectors, and the inertness (e.g. characterised by the tailing factor Tf) and separation power (e.g. resolution Rs) of column, and the reproducibility of RRt values. The detection test mixture may have to be column and detector specific.
False negative result	See beta error
False positive result	See alpha error
Group specific method	Method designed to detect substances having either a common moiety or similar chemical structure. E.g. phenoxy acetic acids, dithiocarbamates, methyl carbamates.
Incurred Residue	Residues of an analyte in a matrix arising by the route through which the trace levels would normally be expected, as opposed to residues from laboratory fortification of samples. Also weathered residue.
Individual Method	Method, which is suitable for determination of one or more specified compounds. A separate individual method may be needed, for instance to determine some metabolite included in the residue definition of an individual pesticide or veterinary drug.
Laboratory Sample	The sample as received at the laboratory (not including the packaging).

Limit of Detection (LD)	Smallest concentration where the analyte can be identified. Commonly defined as the minimum concentration of analyte in the test sample that can be measured with a stated probability that the analyte is present at a concentration above that in the blank sample. IUPAC and ISO have recommended the abbreviation LD. See also Decision Limit.
Limit of Quantitation (LOQ)	Smallest concentration of the analyte that can be quantified. 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. See also Detection Capability.
Lowest Calibrated Level (LCL)	Lowest concentration of analyte detected and measured in calibration of the detection system. It may be expressed as a solution concentration in the test sample or as a mass and must not include the contribution from the blank
Matrix	Material or component sampled for analytical studies, excluding the analyte.
Matrix Blank	Sample material containing no detectable level of the analytes of interest.
Matrix-matched Calibration	Calibration using standards prepared in an extract of the commodity analysed (or of a representative commodity). The objective is to compensate for the effects of co-extractives on the determination system. Such effects are often unpredictable, but matrix-matching may be unnecessary where co-extractives prove to be of insignificant effect.
Method	The series of procedures from receipt of a sample for analysis through to the production of the final result.
Method Validation	Process of verifying that a method is fit for purpose.
Multi residue Method, MRM	Method which is suitable for the identification and quantitation of a range of analytes, usually in a number of different matrices.
Negative Result	A result indicating that the analyte is not present at or above the lowest calibrated level. (see also Limit of Detection)
Performance Verification	Sets of quality control data generated during the analysis of batches of samples to support the validity of on-going analyses. The data can be used to refine the performance parameters of the method.
Positive Result	A result indicating the presence of the analyte with a concentration at or above the lowest calibrated level.
Precision	Closeness of agreement between independent test results obtained under stipulated conditions.
Quantitative Method	A method capable of producing results, expressed as numerical values in appropriate units, with accuracy and precision which fit for the purpose. The degree of precision and trueness must comply with the criteria specified in Table 3.
Recovery	Fraction or percentage of an analyte recovered following extraction and analysis of a blank sample to which the analyte has been added at a known concentration (spiked sample or reference material).
Reagent Blank	Complete analysis made without the inclusion of sample materials for QC purpose.
Reference Material	Material one or more of whose analyte concentrations are sufficiently homogeneous and well established to be used for the assessment of a measurement method, or for assigning values to other materials. In the context of this document the term "reference material" does not refer to materials used for the calibration of apparatus.
Reference Method	Quantitative analytical method of proven reliability characterised by well-established trueness, specificity, precision and detection power. These methods will generally have been collaboratively studied and are usually based on molecular spectrometry. The reference method status is only valid if the method is implemented under an appropriate QA regime.
Reference Procedure	Procedure of established efficiency. Where this is not available, a reference procedure may be one that, in theory, should be highly efficient and is fundamentally different from that under test.

Repeatability	Precision under repeatability conditions, i.e. conditions where independent test results are obtained with the same method on replicate analytical portions in the same laboratory by the same operator using the same equipment within short intervals of time. (ISO 3534-1)
Representative Analyte	Analyte chosen to represent a group of analytes which are likely to be similar in their behaviour through a multi-residue analytical method, as judged by their physico-chemical properties e.g. structure, water solubility, K_{ow}, polarity, volatility, hydrolytic stability, pKa etc.
Represented Analyte	Analyte having physico-chemical properties which are within the range of properties of representative analytes.
Reproducibility	Closeness of agreement between results obtained with the same method on replicate analytical portions with different operators and using different equipment (within laboratory reproducibility). Similarly, when the tests are performed in different laboratories the inter-laboratory reproducibility is obtained.
Representative Commodity	Single food or feed used to represent a commodity group for method validation purposes. A commodity may be considered representative on the basis of proximate sample composition, such as water, fat/oil, acid, sugar and chlorophyll contents, or biological similarities of tissues etc..
Ruggedness	Ability of a chemical measurement process to resist changes in test results when subjected to minor changes in environmental and method procedural variables, laboratories, personnel, etc.
Sample Preparation	The procedure used, if required, to convert the laboratory sample into the analytical sample, by removal of parts (soil, stones, bones, etc.) not to be included in the analysis.
Sample Processing	The procedure(s) (e.g. cutting, grinding, mixing) used to make the analytical sample acceptably homogeneous with respect to the analyte distribution, prior to removal of the analytical portion. The processing element of preparation must be designed to avoid inducing changes in the concentration of the analyte.
Screening Method	A method used to detect the presence of an analyte or class of analytes at or above the minimum concentration of interest. It should be designed to avoid false negative results at a specified probability level (generally β = 5%). Qualitative positive results may be required to be confirmed by confirmatory or reference methods. See Decision Limit and Detection Capability.
Selectivity	Measure of the degree to which the analyte is likely to be distinguished from other sample components, either by separation (e.g., chromatography) or by the relative response of the detection system.
Specificity	Extent to which a method provides responses from the detection system which can be considered exclusively characteristic of the analyte.
Standard Addition	A procedure in which known amounts analyte are added to aliquots of a sample extract containing the analyte (its initially measured concentration being X), to produce new notional concentrations (for example, 1.5X and 2X). The analyte responses produced by the spiked aliquots and the original extract are measured, and the analyte concentration in the original extract (zero addition of analyte) is determined from the slope and intercept of the response curve. Where the response curve obtained is not linear, the value for X must be interpreted cautiously.
Tailing Factor	Measure of chromatographic peak asymmetry; at 10% peak height maximum, the ratio of the front and tail segments of peak width, when separated by a vertical line drawn through the peak maximum.
Test Portion	See "Analytical Portion"
Test Sample	See "Analytical Sample"
Trueness	Closeness of agreement between the average value obtained from a large series of test results and an accepted reference value.
Uncertainty of measurement	Single parameter (usually a standard deviation or confidence interval) expressing the possible range of values around the measured result, within which the true value is expected to be with a stated degree of probability. It should take into account all recognised effects operating on the result, including: overall long-term precision (within laboratory reproducibility) of the complete method; the method bias; sub-sampling and calibration uncertainties; and any other known sources of variation in results.

ABBREVIATIONS

C_{max}	Highest residue detected in replicate analytical portions	MRM	Multi-Residue Method
C_{min}	Lowest residue detected in replicate analytical portions	RRF	Relative response factor
CV_{Atyp}	Typical coefficient of variation of residues determined in one analytical portion.	RRt	Relative retention value for a peak
CV_{Ltyp}	Typical coefficient of variation of analyses of portions of a laboratory sample.	Rs	Resolution of two chromatographic peaks
CV_{Sp}	Coefficient of variation of residues in analytical portions.	SD	Standard Deviation
GLP	Good Laboratory Practice	$S_{y/x}$	Standard deviation of the residuals calculated from the linear calibration function
GSM	Group Specific Method	WHO	World Health Organization
MRL	Maximum Residue Limit		

APPENDIX VI1

PRIORITY LIST OF CHEMICALS SCHEDULED FOR EVALUATION AND RE-EVALUATION BY JMPR

The following are the tentative schedules to be evaluated by the FAO/WHO Joint Meeting on Pesticides Residues (JMPR) from 2002 to 2010

2002 JMPR

Toxicological evaluations	**Residue evaluations**
New compounds	***New compounds***
esfenvalerate (purified isomer of fenvalerate)	esfenvalerate (purified isomer of fenvalerate)
flutolanil	flutolanil
	imidacloprid
Periodic re-evaluations	***Periodic re-evaluations***
acephate (095)	carbaryl (008)
lindane (048)	deltamethrin (135)
metalaxyl-M (purified isomer of metalaxyl)	diflubenzuron (130)
methamidophos (100)	oxamyl (126)
oxamyl (126)	propagite (113)
tolyfluanid (162)	tolyfluanid (162)-
triazophos (143)	
Evaluations	***Evaluations***
	aldicarb (117)
	bitertenol (144)
carbofuran (096) –acute toxicity	carbosulfan (145)
ethephon (106) –acute toxicity	carbofuran (096)
fenamiphos (085) –acute toxicity	cyfluthrin (157)
folpet (041) - acute toxicity	phosmet (103)
oxydemeton methyl –acute toxicity	pyriproxifen (200)

2003 JMPR

Toxicological evaluations	**Residue evaluations**
New compounds	***New compounds***
cyprodinil	cyprodinil
famoxadone	famoxadone
methoxyfenozide	methoxyfenozide
pyraclostrobin	pyraclostrobin
Periodic re-evaluations	***Periodic re-evaluations***
carbosulfan (145)	acephate (095)
cyhexatin (067)/azocyclotin (129)	fenitrothion (037)
paraquat (057)	lindane (048)
terbufos (167) to be clarified	methamidophos (100)
	pirimiphos-methyl (086)
Evaluations	***Evaluations***
dimethoate (027) - acute toxicity	carbendazim (072)/thiophanate-methyl (077)
malathion (049) - acute toxicity	dimethoate (027)
pyrethrins (063)	dicloran (083)
	dodine (084)
	myclobutanil (181)
	pyrethrins (063)

2004 JMPR

Toxicological evaluations	**Residue evaluations**
New compounds	***New compounds***
fludioxinil	fludioxinil
trifloxystrobin	trifloxystrobin
Periodic re-evaluations	***Periodic re-evaluations***
glyphosate (158)	alpha- and zeta- cypermthrin
phorate (112)	cypermethrin (118)
pirimicarb (101)	ethoprophos (149)
triadimefon (133) {should be evaluated	metalaxyl-M
triadimenol (168) {together	paraquat (057)
	prochloraz (142)
	propineb
Evaluations	***Evaluations***
guazatine (114)	chlorpyrifos (017)
fenpyroximate (193) – acute toxicity	dithiocarbamates (105)
haloxyfop (194)	guazatine (114)
	malathion (047)
	oxydemeton-methyl (116)
	2-phenylphenol (056)

2005 JMPR

Toxicological evaluations	**Residue evaluations**
New compounds	***New compounds***
dimethenamid-P	dimethenamid-P
fenhexamid	fenhexamid
indoxacarb	indoxacarb
novaluron	novaluron
Periodic re-evaluations	***Periodic re-evaluations***
benalaxyl (155)	cyhexatin (067)/ azocyclotin (129)
clofentezine (156)	endosulfan (032)
propamocarb (148)	methoprene (147)
propiconazole (160)	glyphosate (158)
	phorate (112)
	terbufos (167)
Evaluations	***Evaluations***
ethoxyquin (035)	ethoxyquin (035)
	oxydemeton-methyl (166)
	methiocarb (132)

2006 JMPR

Toxicological evaluations	**Residue evaluations**
New Compounds	***New Compounds***
Periodic re-evaluations	***Periodic re-evaluations***
cyromazine (169)	pirimicarb (101)
flusilazole (165)	triazophos (143)
procymidone (136)	triadimefon (133) {should be evaluated
profenofos (171)	triadimenol (168) {together
Evaluations	***Evaluations***

2007 JMPR

Toxicological evaluations	**Residue evaluations**
New Compounds	***New Compounds***
Periodic re-evaluations	***Periodic re-evaluations***
azinphos-methyl (002)	clofentezine (156)
cyfluthrin (157)/beta cyfluthrin	permethrin (120)
fentin (040)	propamocarb (148)
vinclozolin (159)	propiconazole (160)
	triforine (116)
Evaluations	***Evaluations***

2008 JMPR

Toxicological evaluations	**Residue evaluations**
New Compounds	***New Compounds***
Periodic re-evaluations	***Periodic re-evaluations***
bioresmethrin (93)	benelaxyl (155)
buprofezin (173)	cyromazine (169)
chlorpyrifos-methyl (090)	*lambda*-cyhalothrin replacement of cyhalothrin
hexythiazox (176)	flusilazole (165)
	procymidone (136)
	profenofos (171)
Evaluations	***Evaluations***

2009 JMPR

Toxicological evaluations	**Residue evaluations**
New Compounds	***New Compounds***
Periodic re-evaluations	***Periodic re-evaluations***
	azinphos-methyl (002)
	cyfluthrin/beta cyfluthrin (157)
	fentin (040)
	vinclozolin (159)
Evaluations	***Evaluations***

2010 JMPR

Toxicological evaluations	**Residue evaluations**
New Compounds	***New Compounds***
Periodic re-evaluations	***Periodic re-evaluations***
	bioresmethrin (93)
	buprofezin (173)
	chlorpyrifos-methyl (090)
	hexythiazox (176)
Evaluations	***Evaluations***

ANNEX I

CANDIDATE CHEMICALS FOR PERIODIC RE-EVALUATION –NOT YET SCHEDULED (confirmation of support required by November 2002)

amitraz (122) residues only	dithianon (180)
bifenthrin (178)	ethion (034)
cadusafos (174)	fenvalerate (119) #
chlorothalonil (081)	fenbutatin oxide (109)
cycloxydim (179)	penconazole (182)

Advice has been received that fenvalerate will be supported by the data submitter during the review process for esfenvalerate and possibly post-review.

ANNEX II

CHEMICALS PROPOSED FOR PRIORITY LISTING BUT FOR WHICH FURTHER CONSIDERATION IS REQUIRED BEFORE A DECISION CAN BE MADE.

DDT (EMRLs)
gentamicin, oxytetracycline
MRLs for various pesticides on spices based on monitoring data