Joint FAO/WHO Food Standards Programme
CODEX ALIMENTARIUS COMMISSION

VOLUME 2

# CODEX ALIMENTARIUS

## PESTICIDE RESIDUES IN FOOD

SECOND EDITION

FOOD AND AGRICULTURE ORGANIZATION
OF THE UNITED NATIONS
WORLD HEALTH ORGANIZATION

**Joint FAO/WHO Food Standards Programme**
**CODEX ALIMENTARIUS COMMISSION**

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**FOOD AND AGRICULTURE ORGANIZATION**
**OF THE UNITED NATIONS**
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**Rome, 1993**

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# INTRODUCTION

The Maximum Residue Limits (MRLs) and other recommendations appearing in this Volume were adopted by the Codex Alimentarius Commission acting on the advice of its Committee on Pesticide Residues. They are consistent with the recommendations of the Joint FAO/WHO Meetings on Pesticide Residues (JMPR).

The JMPR is composed of two panels of experts[1] who serve in their personal capacity only and who do not represent or otherwise present the views of their governments or organizational affiliation. These experts meet jointly to evaluate selected pesticide residues on the basis of available data obtained from various sources, including governments, industry and academia. Where appropriate, they establish "Acceptable Daily Intakes" (ADIs) and recommend MRLs for residues of pesticides on foods and animal feeds.

Acceptance of Codex MRLs for pesticide residues by Member Nations and Associate Members of FAO and/or WHO, proceeds as described in Section 1, Volume 1 (1992), under "General Principles of the Codex Alimentarius".

[1] *The FAO Expert Panel on Pesticide Residues in Food and the Environment and the WHO Expert Panel on Pesticide Residues.*

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# SECTION 1

# LIST OF CODEX MAXIMUM RESIDUE LIMITS FOR PESTICIDES

# LIST OF CODEX MAXIMUM RESIDUE LIMITS FOR PESTICIDES

## INTRODUCTION

The present volume contains all Maximum Residue Limits for pesticides adopted by the Commission up to and including its 19th Session. Further adoptions by the Commission will be published as an Addendum to Volume 2. The pesticides in this Section are listed in numerical order of the Codex code number. The missing numbers represent pesticides for which (a) Codex maximum limits are being elaborated, (b) for which previously established Codex MRLs have been withdrawn, or (c) for which only "guideline levels" have been recommended by the Joint Meeting on Pesticide Residues pending toxicological clearance of the pesticide and its residues.

## BASIS FOR ESTABLISHMENT OF CODEX MAXIMUM RESIDUE LIMITS AND CODEX EXTRANEOUS RESIDUE LIMITS

Codex "Maximum Residue Limits" (MRLs) are recommended on the basis of appropriate residue data obtained mainly from supervised trials. The residue data thus obtained reflect registered or approved usage of the pesticide in accordance with "good agricultural practices". These may vary considerably from region to region owing to differences in local pest control requirements which are due to a variety of reasons. Consequently, residues in food, particularly at a point close to harvest may also vary. In establishing Codex MRLs, these variations in residues due to differences in "good agricultural practices" are taken into consideration, as far as possible on the basis of available data.

As Codex MRLs cover a wide spectrum of use patterns and "good agricultural practices" and need to reflect residue levels closely following harvest, they may occasionally be higher than the levels of residues found in national surveillance activities. This may be especially so with easily degradable pesticides and when analysis is carried out at a point in the distribution chain far removed from the last application of the pesticide.

Codex MRLs are established only where there is supporting evidence concerning the safety to humans of the resulting residues as determined by the Joint FAO/WHO Meeting on Pesticide Residues and this means that Codex Maximum Residue Limits represent residue levels which are toxicologically acceptable.

Another type of Codex Maximum Limit, the Codex "Extraneous Residue Limit" (ERL) which covers residues arising from environmental contamination or uses of pesticides other than agricultural uses. It is mainly based on residue data obtained from national food control or monitoring activities. Codex ERLs need to cover widely varying residue levels in food reflecting differing situations in respect of contamination of food by environmental and persistent pesticide residues. For this reason, Codex ERLs cannot always reflect strictly the actual local residue situation existing in given countries or regions. Codex ERLs represent acceptable residue levels which are intended to facilitate international trade in food while protecting the health of the consumer. They are established only when there is supporting evidence concerning the safety to humans of the residues as determined by the Joint FAO/WHO Meeting on Pesticide Residues.

## CODEX MAXIMUM RESIDUE LIMITS AND CONSUMER PROTECTION: DETERMINATION OF TOTAL DAILY INTAKE OF PESTICIDE RESIDUES

The primary purpose of setting maximum limits for pesticide residues in food and in some cases, in animal feeds, is to protect the health of the consumer. Codex MRLs and ERLs serve that primary purpose as they help to ensure that only the minimum amount of pesticide is applied to food consistent with real pest control needs. Codex Maximum Residue Limits are based on residue data from supervised trials and not directly derived from Acceptable Daily Intakes (ADIs), which are a quantitative expression of acceptable daily amounts of residue which persons may ingest on a long term basis and which are established on the basis of appropriate toxicological data mainly from animal studies.

The acceptability of Codex Maximum Residue Limits is judged on the basis of a comparison of the acceptable daily intake with estimated daily intakes, as determined on the basis of suitable intake studies. Intake data from such studies, compared with acceptable daily intakes, help in determining the safety of foods in respect of pesticide residues. Guidelines for predicting Dietary Intakes of Pesticide Residues have been prepared under the joint sponsorship of UNEP, FAO and WHO[1].

## CODEX MAXIMUM RESIDUE LIMITS FOR MILK AND MILK PRODUCTS

Codex Maximum Residue Limits for fat-soluble pesticide residues in milk and milk products are expressed on a whole product basis.

For a "milk product" with a fat content less than 2%, the MRL applied should be half those specified for milk. The MRL for "milk products" with a fat content of 2% or more should be 25 times the maximum residue limit specified for milk, expressed on a fat basis.

Fat soluble pesticide residues to which the above general provision applies, are indicated by means of the letter "F" in conjunction with the MRL specified for milk.

## CODEX MAXIMUM RESIDUE LIMITS FOR PROCESSED FOODS

As a rule, Codex MRLs and ERLs are established for raw agricultural commodities, However, where it is considered necessary for consumer protection and facilitation of trade. MRLs and ERLs are also established for certain processed foods on a case-by-case basis, taking into consideration information on the influence of processing on residues.

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[1] (Ref. Guidelines for Predicting Dietary Intake of Pesticide Residues, Joint UNEP/FAO/WHO, World Health Organization, Geneva 1989).

## EXPLANATORY NOTES

The foods listed in the columns marked "commodity" shall not contain more than the maximum amount (in mg/kg) stated in the columns marked "Maximum Residue Limit", of the pesticide residue (defined in each individual case in the definition of residue) at (a) the point of entry into a country or (b) at the point of entry into trade channels within a country. This maximum limit shall not be exceeded at any time thereafter.

The Codex maximum residue limits (MRLs) apply to the residue content of the final sample representative of the lot and of the portion of commodities which is analyzed. (See Section 4 of this Volume).

Dates of Estimation of Acceptable Daily Intakes (ADIs)

ADIs - The year of estimation or confirmation is shown in parenthesis.

TADIs - The period from the year of estimation or most recent extension to the year by which data needed for the estimation of a full ADI are required, is shown in parenthesis.

Notes on the MRLs

| | | | |
|---|---|---|---|
| (*) | (following MRLs) | : | At or about the limit of determination. |
| E | (following MRLs) | : | Extraneous Residue Limit (ERL). |
| F | (following MRLs for milk) | : | The residue is fat soluble and MRLs for milk products are derived as explained earlier in this Section. |
| (Fat) | (following MRLs for meat) | : | The MRLs apply to the fat of meat. |
| Po | (following MRLs) | : | The MRL accommodates post-harvest treatment of the commodity. |
| PoP | (following MRLs for processed foods) | : | The MRL accommodates post-harvest treatment of the primary food commodity. |
| T | (following MRLs) | : | The MRL is temporary, irrespective of the status of the ADI, until required information has been provided and evaluated. |
| V | (following MRLs for products of animal origin) | : | The MRL accommodates veterinary uses. |

# ALPHABETIC INDEX OF PESTICIDE CHEMICALS FOR WHICH MAXIMUM RESIDUE LIMITS HAVE BEEN RECOMMENDED OR ARE UNDER CONSIDERATION

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168 TRIADIMENOL
169 CYROMAZINE
170 HEXACONAZOLE
171 PROFENOFOS
172 BENTAZONE
173 BUPROFEZIN
174 CADUSAFOS
175 GLUFOSINATE-AMMONIUM
176 HEXYTHIAZOX

# LIST OF CODEX MAXIMUM RESIDUE LIMITS FOR PESTICIDES

References

(1) **Code Number and Name of Commodity** - Reference to the Codex Classification of Foods and Animal Feeds [see Section 2].

(2) **JMPR** - Year of the JMPR evaluation or subsequent review.

(3) **CCPR** - Number of CCPR session and paragraph of the related CCPR report (i.e. 23.105).

## (1) ALDRIN AND DIELDRIN

JMPR 65, 66, 67, 68, 69, 70, 74, 75, 77, 90
ADI 0.0001 mg/kg body weight | (Confirmed 1977)
Residue Sum of HHDN and HEOD (fat-soluble).
Note 23rd CCPR (1991) agreed with the recommendation of the 1990 JMPR to convert existing CXLs to TERLs, pending monitoring data (23.71).

| Commodity code | No. | Name | MRL (mg/kg) | | |
|---|---|---|---|---|---|
| VS | 0621 | Asparagus | 0.1 | | E T |
| VB | 0400 | Broccoli | 0.1 | | E T |
| VB | 0402 | Brussels sprouts | 0.1 | | E T |
| VB | 0041 | Cabbages, Head | 0.1 | | E T |
| VR | 0577 | Carrot | 0.1 | | E |
| VB | 0404 | Cauliflower | 0.1 | | E T |
| GC | 0080 | Cereal grains | 0.02 | | E |
| VC | 0424 | Cucumber | 0.1 | | E T |
| VO | 0440 | Egg plant | 0.1 | | E T |
| PE | 0112 | Eggs | 0.1 | | E |
| AO2 | 0001 | Fruits | 0.05 | | E T |
| VR | 0583 | Horseradish | 0.1 | | E T |
| VL | 0482 | Lettuce, Head | 0.1 | | E |
| MM | 0095 | Meat | 0.2 | (fat) | E |
| ML | 0106 | Milks | 0.006 | F | E |
| VA | 0385 | Onion, Bulb | 0.1 | | E T |
| VR | 0588 | Parsnip | 0.1 | | E T |
| VO | 0051 | Peppers | 0.1 | | E T |
| VO | 0445 | Peppers, Sweet | 0.1 | | E T |
| VR | 0589 | Potato | 0.1 | | E T |
| VR | 0494 | Radish | 0.1 | | E T |
| VL | 0494 | Radish leaves | 0.1 | | E T |

## (2) AZINPHOS-METHYL

JMPR 65, 68, 72, 73, 74, 91
ADI 0.005 mg/kg body weight | (1991)
Residue Azinphos-methyl.

| Commodity code | No. | Name | MRL (mg/kg) | |
|---|---|---|---|---|
| AL | 1021 | Alfalfa forage (green) | 2 | |
| TN | 0660 | Almonds | 0.2 | |
| FS | 0240 | Apricot | 2 | 1/ |
| VB | 0400 | Broccoli | 1 | |
| VB | 0402 | Brussels sprouts | 1 | 1/ |
| VS | 0624 | Celery | 2 | 1/ |
| GC | 0080 | Cereal grains | 0.2 | |
| FC | 0001 | Citrus fruits | 2 | 1/ |
| SO | 0691 | Cotton seed | 0.2 | |
| AO2 | 0002 | Fruits (except..) | 1 | 1/ 2/ |
| FB | 0269 | Grapes | 4 | |
| FI | 0341 | Kiwifruit | 4 | |
| VC | 0046 | Melons, except Watermelon | 2 | |
| AL | 0528 | Pea vines (green) | 2 | 1/ |
| FS | 0247 | Peach | 4 | |
| VR | 0589 | Potato | 0.2 | |
| VD | 0541 | Soya bean (dry) | 0.2 | |
| AL | 1265 | Soya bean forage (green) | 2 | fresh wt |
| SO | 0702 | Sunflower seed | 0.2 | 1/ |
| AO1 | 0002 | Vegetables (except..) | 0.5 | 1/ 2/ |

1/ JMPR 1991 recommended to withdraw the MRL
2/ (Except as otherwise listed)