codex alimentarius commission

FOOD AND AGRICULTURE ORGANIZATION OF THE UNITED NATIONS

WORLD HEALTH ORGANIZATION

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MAXIMUM RESIDUE LIMITS FOR PROCESSED OR READY-TO-EAT FOODS OR FEEDS

Prepared by the Delegation of the U.S.A.

A. Background and Introduction

The 34th CCPR briefly discussed the value, need, and policy for establishing Maximum Residue Limits (MRLs) for pesticide residues in processed or ready-to-eat food materials. In particular, this subject arose under the topics of pending CXLs for malathion (49), thiabendazole (65), and 2-phenylphenol (56) as shown in Attachment 1.

MRLs for residues in processed foods and feeds has been the subject of prior CCPR and JMPR deliberations. Some published conclusions from these instances are included in Attachment 2. Generally, these conclusions indicate that MRLs for raw agricultural commodities (RACs) also apply to derived processed foods and feeds and that separate MRLs are established for processed foods and feeds when residues concentrate compared to the corresponding RAC. Other special situations that may require MRLs for processed foods include (1) extensive consumption by children (2) toxic substances formed during processing and (3) when residues result from use of pesticides during processing or storage practices.

To clarify the past practices of CCPR regarding the establishment of processed food MRLs, this paper examines established Codex Maximum Residue Limits (CXLs) and proposed MRLs for processed / ready-to-eat foods and derived feed items. This includes processed or ready-to-eat food residue limits that are higher than, equal to, or lower than those of the corresponding raw agricultural commodity (RAC). The well-known purpose of processed food MRLs that are higher than RAC MRLs is to accommodate residues that are found to concentrate during processing. Therefore, the discussion below will focus on instances where MRLs may exist or be proposed at levels equal to or below that of the RAC food. In these cases, the MRLs may be unnecessary.

In addition, this paper highlights some areas where there has been inconsistency in past CCPR practices, and recommends adoption of a clear policy concerning processed or ready to eat food CXLs equal to or below the corresponding RAC including specific circumstances, if any, where they are necessary. Consistent use of such a policy would likely improve the usefulness of and confidence in CXL standards in the future.

B. Procedures

It was believed that the most frequent crops for which processed food MRLs have been proposed or established have been cereal grains, fruits, or oil seed crops. The research centered on these areas. Some additional limited searches were carried out to find relevant instances of MRLs outside of these crop groups, but these were largely unproductive.

Pending MRLs. Using the "find" tool, the Adobe Acrobat file for the Report of the 34th CCPR Meeting (Alinorm 03/24), was searched for text containing the terms "juice", "flour", "meal", "oil", "bran", "polished", "husked", "dried", "germ" to identify pending CXLs in the step process. Instances of pending MRLs for processed or ready-to-eat foods were noted and listed in Attachment 3.

Established CXLs. The established CXLs for pesticide chemicals at the database website

http://apps.fao.org/CodexSystem/pestdes/pest_q-e.htm

were examined for crops and crop commodities listed in Attachment 4.

These searches provided many instances of established CXLs for processed or ready-to-eat foods, and these are listed in Attachment 5. For some processed commodities, there were no occurrences of established CXLs found; those commodities are noted in Attachment 4, and are not included in Attachment 5. Some related statistical information is provided at the end of each table.

C. Results

Inspection of the information in Attachments 3 and 5 allows the following general summary statements.

Fruits

There are no established CXLs for fruit juices or tomato juice. The only established CXLs for edible processed fruit commodities are for dried fruits (grapes, raisins, figs dates, and general fruits) and for livestock feed commodities (apple pomace, dried citrus pulp, and dried grape pomace) that arise during pressing to obtain juice (Attachment 5, Tables I.A to I.D). Generally speaking, there are many chemicals that have fruit RAC CXLs, but for which there are no CXLs for related fruit processed (dried) commodities. For instance there are 51 established grape CXLs, but only 6 for dried grapes and one for raisins. There are more than 140 CXLs for citrus, pome, apples, banana, and apricot fruits, but only 14 CXLs related to the corresponding dried fruits. For all but two of the established processed fruit CXLs (fenarimol on grapes and bromide ion on prunes are the exceptions), the numerical level is higher than that of the fruit RAC. Therefore, predominantly, CXLs in this category accommodate instances of residue concentration during dehydration. In the cases of dried fruits, the availability of processing data may have been the most significant consideration in whether the JMPR proposed a separate MRL for the processed food. In instances where no processing data were available, very likely only the MRL for the fruit RAC was proposed. Members of the US Delegation also knew of cases where processing data from dried fruits demonstrate that residues did not concentrate during drying of fruit, possibly due to peeling or prewashing or heating during the drying process.

Presently, there are 13 pending MRLs (Attachment 3, Table I) in the step process for dried grapes (5), dry citrus pulp (3), tomato juice (2), apple juice (1), citrus juice (1), and orange juice (1). Three of these are derived from post-harvest GAP. Four of the 13 proposed MRLs (30%) are necessary to accommodate concentration of pesticide residues in dried grapes or in dry citrus pulps compared to that in the fruit RAC, and the other nine are proposed at levels equal to or up to 99% below that for the corresponding fruit RAC. Therefore, unlike the established CXLs for dried fruits, the majority of pending fruit MRLs are not needed to accommodate concentration of residue during processing; the reasons for proposing MRLs at levels equal to or below the prevailing fruit RAC are not evident.

Cereals

There are 30 sets of CXLs pertaining to processed cereal fractions (Attachment 5, Tables II.A to II.D). Each set generally consists of a CXL for the chemical on the grain RAC plus two to five additional CXLs for various processed fractions, produced primarily through milling. In four cases, this even includes a CXL for bread prepared from the processed grain. The established processed food CXLs are predominantly for wheat (74%) or rice (18%), and the remainder are for maize or rye. Three-quarters of the chemicals for which processed cereal CXLs have been established have GAP that allows post-harvest treatments, so attention has clearly been focused on chemical residues that may arise during storage or shipment of grains where post-harvest cereal treatment is permitted. More than half of the established processed grain fraction CXLs are at levels equal to or below that of the CXL on the grain RAC; the scientific or trading justification for these lower CXLs was not investigated individually.

The pending cereal grain processed food MRLs (Attachment 3, Table II) reflect the patterns described above for established CXLs. 14 (54%) are for wheat processed commodities and about 35% are for levels below that of the grain RAC. For haloxyfop on rice and piperonyl butoxide on maize, no MRL proposal for the RAC was identified for comparison to those proposed for the processed food.

For the crop rice, there is an inconsistency in terminology. There are 6 cases (Attachment 5, Table II.D) for which a CXL is established for "rice, husked" in the absence of a CXL for "rice". In other cases (e.g., carbaryl, diquat, pirimiphos-methyl) "rice, husked" is presented as a processed commodity in addition to the rice RAC. Therefore, further clarity regarding preferred nomenclature among rice commodities would be helpful.

Other Processed Foods

This category consists entirely of oils obtained from the seed crops (cotton, peanut, rape, soya bean, sunflower) and from olives. Attachment 5, Table III.A to III.F lists the established CXLs for crude or refined (edible) oils from these crops compared to the corresponding RAC CXL. Cotton is represented most frequently (42%) with peanut and sunflower the next most frequent. Three-quarters of the established CXLs for processed oils are at levels below that of the corresponding seed or olive RAC. In only one case (pirimiphos-methyl on peanuts) is the existence of oil CXLs linked to post-harvest pesticide treatment of the seed. It is however noteworthy that 44 – 90% of the established pesticide RAC CXLs for the six crops listed in the Attachment 5 Tables IIIA – III.F do not have a corresponding CXL for the processed oil fraction. This ranges from 44% of olive CXLs to 90% of rape seed CXLs. It is possible that the availability of processing data to the JMPR is related to the existence or absence of a processed food (oil) CXL; however, the scientific or trading justification for establishing so many CXLs at levels below those of the corresponding RAC is unclear.

Attachment 3 Table III lists pending MRLs for other processed foods, and they are also all related to oil fractions. The distribution of these pending CXLs across the subject crops is very comparable to those that are already established. For this group, 79% are proposed at levels that are below that of the corresponding RAC commodity. In the case of haloxyfop, no corresponding soya bean MRL proposal was identified.

Dietary Exposure Procedures

Some commenters have suggested that established and proposed processed food or feed MRLs below those of the RAC are needed to support adequate evidence of dietary safety in cases where processing reduces residues. The FAO Manual on Submission and Evaluation of Pesticide Residues Data describes the procedures used by the JMPR to estimate exposure. It states "In using processing data on the effects on residue levels of processing or cooking practices, the mean processing factor should be applied to the STMR estimated for the raw agricultural commodity as already described. The STMR value estimated in this way for the processed commodity should be referred to as the STMR-P." Essentially the same procedure is recommended in WHO's Guidelines for Predicting Dietary Intake of Pesticide Residues (Revised) (WHO, IPCS, Geneva, 1993). These explanations clarify that MRLs for the processed food or feed are not required

to conduct appropriate dietary risk assessment; the JMPR has procedures in place to evaluate dietary exposure from processed foods or feeds versus the ADI or RfD without the necessity of explicit MRLs.

D. Conclusions

This analysis has revealed inconsistencies regarding the past practices and the continuing need for establishing Codex Maximum Residue Limits for processed or ready-to-eat foods and animal feeds.

Previous written recommendations (Appendix 2) have indicated that processed food CXLs are necessary principally only when residues concentrate during processing. However, the data in Attachments 3 and 5 show that there are more than 100 instances of pending and established processed food or feed CXLs at levels equal to or less than the corresponding CXL for the RAC. Furthermore, there is inconsistency with a given crop because often only a small portion of the RAC CXLs are accompanied by processed food CXLs even when concentration is likely, as with dried fruits.

To improve efficiency and consistency, it would be sensible for CCPR to re-adopt very clear procedures regarding when a processed food CXL is appropriate and when it is not. This should include a policy that strongly recommends that processing data be available to the JMPR in order to support a CXL in RACs where derived processed food(s) is/are traded internationally.

Consider the following:

1. As a matter of principle, the MRL for a RAC commodity applies to pesticide residues in that commodity and in processed foods or feeds derived from it. This concept is universally accepted and functioning at both national and international levels. However, the statements in Attachment 2 have included phrases like “as a rule”, “should be”, and “the guidelines” which leave room for interpretation. An unequivocal policy statement would eliminate any remaining uncertainty.

2. Chemical residues that are shown to concentrate above levels in the RAC during processing require MRLs for the processed food or feed commodities that are traded in international commerce. Otherwise international trade could be disrupted.

3. The JMPR currently relies on the Codex Alimentarius Classification as its guide to identify major internationally traded processed commodities. Where the Classification indicates that a RAC is linked to traded processed foods or feeds, data to show the effects of processing on the residue are scientifically necessary to support a RAC MRL, because that MRL implicitly applies to such processed food items. It is therefore strongly recommended that relevant processing data be made available to the JMPR. The CCPR should consider if there are circumstances when the absence of processing data ought to prevent the RAC MRL from being finalized.

4. Since RAC CXLs apply to processed foods derived from them, the purpose of the 17 pending MRLs and 24 established CXLs for processed foods and feeds at the same level as the RAC is unclear. If the processed food MRLs did not exist, the same residue limit would be extrapolated from the RAC MRL anyhow. Processed food MRLs at the same level as the RAC commodity should be eliminated in favor of the policy stated in point 1 above.

5. Further, in light of point 1 above, it is also unclear from this present analysis why there are many established and pending processed or ready-to-eat food MRLs at levels below that of the RAC MRL. JMPR has routinely used processing data where available to estimate residue levels in derived processed commodities for dietary exposure assessment. This procedure is reasonable and should continue. However, there is no need to carry such calculations forward to MRL status unless there are special circumstances or a history of trading problems.

6. The 1993 Codex Classification (Attachment 2) lists three specific reasons beyond residue concentration for the establishment of processed food or feed MRLs. Point (i) is not relevant under the current process for dietary exposure estimate, since STMR or Highest Residue (HR) values are used in conjunction

with consumption estimates to address this issue. There rarely seems to be data concerning point (ii). Point (iii) could have relevance in the case of pesticides used in cereal grain storage. However, it is unclear from the wording whether point (iii) referred to pesticide use solely during storage of *already processed* foods or during storage of either RAC or processed foods. It would be most logical if it applied only to the former situation, since the RAC MRL ought to account for GAP allowing pesticide use during RAC storage.

7. The US, and likely most other countries, do not establish national MRLs for processed foods or feeds or ready-to-eat foods that are below the MRL of the RAC. The existence of these lower-level Codex MRLs in the absence of comparable national MRLs represents a potential unnecessary trading barrier. Their existence can also create an unusual dichotomy. Consider, for example, the pending CXLs for clethodim on soya beans (10 ppm) and refined soya bean oil (0.5 ppm). If US seed were grown, refined, and consumed in the US, the national 10 ppm MRL applies to the oil. If the beans are shipped to a second country and refined there, the 10 ppm MRL will apply to the soya bean shipment at the international level. However, if the US-refined oil were shipped internationally, the 0.5 ppm MRL will apply to the shipment. Based on this, if the oil contained 1 ppm clethodim residue, it could be rejected for import in the second country, even though the same soya beans could be imported and processed into oil there without difficulty.

8. Within the fruits that have dried processed foods or feeds traded in international commerce, such as grapes, an absence of available data on the effects of processing (drying) may create an inadvertent situation where residues in dried fruits exceed the fruit RAC CXL that implicitly applies to the dried commodity. During Periodic Review, it is desirable to reconsider whether processing data are available to support the conclusion that fruit RAC CXLs are adequate to accommodate drying or whether there are GAP directions that limit pesticide use to fruits that are not used for drying.

9. Within cereals, there is a substantial correlation between pesticides that are used in post-harvest grain treatments and those that have now have cereal processed-fraction CXLs. The only exceptions are bromide, glyphosate, and diquat, which have processed-fraction CXLs but are not used in post-harvest storage. The CCPR should clarify if the existence of GAP that authorizes post-harvest use of a chemical in cereals is sufficient justification for the establishment of MRLs on derived processing fractions regardless of whether residues concentrate. Alternatively, it could be clarified that such an MRL is needed only when pesticides are applied to stored grain materials *after* they have been processed. A corollary of either decision should be that MRLs for processed cereal fractions arising from uses of pesticides only in growing cereal crops should be established or maintained only if the residue concentrates on processing.

10. For fruit juices, it seems sensible to follow the same procedures as for cereals. That is, establish MRLs only if residues are concentrated in the processed juice. It is not believed that pesticides are ever used in the post-processing storage of fruit juices.

11. The existence of CXLs for "white bread" or other complex blended foods seem difficult to support. Processed / ready-to-eat foods and feeds MRLs should only be established for *primary* processed materials typically produced by commercial facilities. Flour is a primary processed food but bread is not. Bread includes possible residue contributions from various components like oils, sugars, flour, etc. For instance, pirimiphos-methyl has CXLs on wheat and its processed fractions, but also has peanuts and peanut oil CXLs, and in the US it has MRLs on maize. The existence of many bread recipes and possible components seems to make adequate evaluation to ensure compliance with the pirimiphos-methyl CXL for white bread nearly impossible. It is also questioned if there are sampling protocols appropriate for enforcement testing of loaves of bread. Overall, MRLs on secondary processed and blended foods should not be established.

E. Next Steps

The following explicit policy points are proposed for adoption or reaffirmation by the CCPR:

1. MRLs for raw agricultural commodities apply to all processed foods and feeds derived from them unless separate higher MRLs exist for specific processed commodities.

2. Processed foods are those specifically listed in Class D and Class E of Codex Alimentarius, Volume Two, Pesticide Residues in Food 2nd Editions (1993) and the amendments / revisions thereto.

3. A MRL proposal for a processed food will only be considered when the residue concentrates significantly on processing. If the residue in the processed commodity is 0 – 110% of that in the RAC, the RAC CXL is adequate for the processed commodity.

4. For pesticides used in facilities where processed foods are prepared, stored, or transported, additional MRLs may be considered on a case-by-case basis.

5. Acceptable residue data are strongly recommended in support of RAC MRLs that will also apply to processed foods (point 2 above) in order to determine if residues concentrate or not.

6. The JMPR is encouraged to continue the practice of reviewing studies on the effects of processing on residues in its Monograms and to utilize such results in conjunction with STMR-P and HR-P values for dietary exposure assessments.

Attachment 1. Excerpts from Alinorm 03/24

MALATHION (49)

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.

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.

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 finalize the acute intake estimate. The delegation of Germany expressed a desire for JMPR to establish MRLs for citrus juices. Delegations were requested to advise JMPR of the availability of data to support the establishment of such MRLs.

Attachment 2. Conclusions from Prior Discussion Concerning Processed Food MRLs at CCPR.

1. Codex Alimentarius Commission, Classification of Foods and Feeds (2nd Edition, Rome, 1993), Section 1, Volume 2, page 4.

"Codex Maximum Residue Limits for Processed Foods

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

[Also found at Explanatory Notes to the Codex Alimentarius: Pesticide Residues in Food at http://apps.fao.org/page/collections?subset=FoodQuality]

2. Report of the 12th Session of the Codex Committee on Pesticide Residues, ALINORM 81/24. Paragraphs 27 – 31 [as summarized in CX/PR 98/13 Jan-1998]

"The guidelines contain the following principles for Member Countries to consider in order to facilitate international trade of processed foods:

(a) MRLs for raw agricultural commodities also apply to the processed forms of that commodity, including partially processed food or food that would undergo further processing.

(b) Separate MRLs will not be established for a processed food, unless (i) the level of residue is proven greater in the processed food than in the raw agricultural commodity when the pesticide is used in accordance with GAP; or (ii) other special situations arise that may warrant a MRL for a processed food."

3. Codex Alimentarius Commission, Classification of Foods and Feeds (2nd Edition, Rome, 1993), Section 2, Volume 2, page 150.

"In the event that residues are greater in the processed food than in the raw agricultural commodity from which it is derived, a separate MRL should be considered for the processed food. In addition, there are a number of situations where special considerations may be needed:

i. when the processed food represents the sole or major food intake of infants and young children;

ii. when toxic interaction or degradation products from pesticides are found in the food during or after processing;

iii. when a significant residue results from a pesticide used in processing or storage practice (including impregnation of wrapping materials)."

4. *FAO manual on the submission and evaluation of pesticide residues data for the estimation of maximum residue levels in food and feed*, 2nd edition, Rome, (2002). Chapter 5.

"The JMPR is aware that there is a considerable trade in manufactured foods based, for example, on fruits, vegetables, cereals and meat. However, the variety of forms under which the products are offered makes it impossible to recommend MRLs for all possible processed foods. For this reason the JMPR has specified that, in the case of processed foods for which no MRLs have been recommended, the maximum residue permitted in the processed food should not be greater than the maximum residue permitted in the equivalent weight of the raw agricultural commodity. The JMPR frequently estimates maximum residue levels for important processed foods and feeds in international trade when residues concentrate in these products at levels higher than in the raw agricultural commodities from which they are derived (e.g. oil, bran, peel, etc.). Even when the estimates are not recommended for use as maximum residue limits or when residues do not concentrate in the processed product, the JMPR will continue to record in its monographs the effect of processing on the level and fate of residues."

Attachment 3. Pending MRLs for Processed or Ready-to-Eat Foods

Pending CXLs for Fruits

Chemical	No.	Juice	Level (mg/kg)	Step	RAC	Level (mg/kg)	Conc. Ratio*
Captan	7	Dried grapes	50	6	Grapes	25 (Step 6)	2x
Carbosulfan	145	Citrus pulp, dry	0.1	6	Citrus fruits	0.1 (Step 6)	1x
Chlorpyrifos	17	Dried grapes	0.1	5	Grapes	0.5 (Step 5)	0.2x
Diphenylamine	30	Apple juice	0.5	3	Apple (Po)	5; 10 (Step 3a)	0.1x
Ethephon	106	Dried grapes	5	6	Grapes	??	
Folpet	41	Dried grapes	40	6	Grapes	2	20x
Piperonyl butoxide	62	Citrus juice	0.05	3	Citrus fruits	5 (Step 3)	0.01x
Piperonyl butoxide	62	Tomato juice	0.3	3	Tomato	2 (Step 3)	0.15x
Malathion	49	Tomato juice	0.01	6	Tomato	3	0.003x
Methomyl	94	Citrus pulp (dry)	3	3	Citrus fruits	1	3x
2-phenylphenol	56	Citrus pulp (dry)	60	8	Citrus fruits (Po)	10	6x
2-phenylphenol	56	Orange juice	0.5	8	Citrus fruits (Po)	10	0.05x
Tebufenozide	196	Dried grapes	2	3	Grapes	2 (Step 6)	1x

Pending MRLs for Cereal processing fractions

Chemical	No.	Commodity	Level (mg/kg)	Step	RAC	Level (mg/kg)	Conc. Ratio*
Carbendazim	72	Rice, Husked	2	8	Rice	???	
Chlormequat	15	Rye flour	3	5	Rye	5	0.6x
Chlormequat	15	Rye, whole meal	4	8	Rye	5	0.8x
Chlormequat	15	Wheat flour	2	6	Wheat	5	0.4x
Chlormequat	15	Wheat whole meal	5	6	Wheat	5	1x
Chlormequat	15	Wheat bran, unprocessed	10	6	Wheat	5	2x
Chlorpyrifos	17	Wheat flour	0.1	5	Wheat	0.5 (Step 5)	0.2x
Chlorpyrifos	17	Maize oil, Edible	0.2	5	Maize	0.05 (Step 5)	4x
Haloxyfop	194	Rice bran, Unprocessed	0.02	6	Rice	???	
Haloxyfop	194	Rice, Husked	0.02	6	Rice	???	
Haloxyfop	194	Rice, Polished	0.02	6	Rice	???	
Malathion	49	Wheat flour	0.2	5	Cereal	8	0.025x

Chemical	No.	Commodity	Level (mg/kg)	Step	RAC	Level (mg/kg)	Conc. Ratio*
					grains		
Methomyl	94	Wheat flour	0.03	3	Wheat	0.5	0.06x
Methomyl	94	Wheat germ	2	3	Wheat	0.5	4x
Methomyl	94	Wheat bran, unprocessed	3	3	Wheat	0.5	6x
Methomyl	94	Maize oil, Edible	0.02	3	Maize	0.05	0.4x
Parathion methyl	59	Maize flour	0.05	5	Maize	0.1 (Step 5)	0.5x
Parathion methyl	59	Maize oil, crude	0.2	5	Maize	0.1 (Step 5)	2x
Parathion methyl	59	Maize oil, Edible	0.1	5	Maize	0.1 (Step 5)	1x
Parathion methyl	59	Wheat flour	2	5	Wheat	5 (Step 6)	0.4x
Parathion methyl	59	Wheat bran, unprocessed	10	6	Wheat	5 (Step 6)	2x
Piperonyl butoxide	62	Wheat flour	10	3	Wheat	10	1x
Piperonyl butoxide	62	Wheat whole meal	30	3	Wheat	10	3x
Piperonyl butoxide	62	Wheat, bran, unprocessed	100	3	Wheat	10	10x
Piperonyl butoxide	62	Wheat germ	100	3	Wheat	10	10x
Piperonyl butoxide	62	Maize oil, crude	80	3	Maize	???	

Pending MRLs for other commodities:

Chemical	No.	Commodity	MRL (ppm)	Step	RAC	MRL (ppm)	Conc. Ratio*
Clethodim	187	Cotton seed oil, Crude	0.5	6	Cotton seed	0.5 (Step 6)	1x
Clethodim	187	Cotton seed oil, Edible	0.5	6	Cotton seed	0.5 (Step 6)	1x
Clethodim	187	Rape seed oil, Crude	0.5	6	Rape seed	0.5 (Step 6)	1x
Clethodim	187	Rape seed oil, Edible	0.5	6	Rape seed	0.5 (Step 6)	1x
Clethodim	187	Soya bean oil, Crude	1	6	Soya bean, dry	10 (Step 6)	0.1x
Clethodim	187	Soya bean seed oil, Refined	0.5	6	Soya bean, dry	10 (Step 6)	0.05x
Clethodim	187	Sunflower seed oil, Crude	0.1	6	Sunflower seed	0.5 (Step 6)	0.2x
Chlormequat	15	Rape seed	0.1	8	Rape seed	5 (Step 8)	0.02x

Chemical	No.	Commodity	MRL (ppm)	Step	RAC	MRL (ppm)	Conc. Ratio*
		oil, Crude					
Fenamiphos	85	Cotton seed oil, Crude	0.05	6	Cotton seed	0.05	1x
Fenamiphos	85	Peanut oil, Crude	0.05	6	Peanut	0.05	1x
Haloxyfop	195	Cotton seed oil, Crude	0.5	6	Cotton seed	0.2 (Step 6)	2.5x
Haloxyfop	195	Rape seed oil, Crude	5	6	Rape seed	2 (Step 6)	2.5x
Haloxyfop	195	Rape seed oil, Edible	5	6	Rape seed	2 (Step 6)	2.5x
Haloxyfop	195	Soya bean oil, Crude	0.2	6	Soya bean	???	
Haloxyfop	195	Soya bean oil, Refined	0.2	6	Soya bean	???	
Malathion	49	Cotton seed oil, Crude	13	6	Cotton seed	20 (Step 6)	0.7x
Kresoxim methyl	199	Olive oil, Virgin	0.7	3	Olives	0.2 (Step 3)	3.5x
Malathion	49	Cotton seed oil, Edible	13	6	Cotton seed	20 (Step 6)	0.7x
Methomyl	94	Cotton seed oil, Edible	0.04	3	Cotton seed	0.5	0.08x
Methomyl	94	Soya bean oil, Crude	0.2	3	Soya bean	0.2	1x
Methomyl	94	Soya bean oil, Crude	0.2	3	Soya bean	0.2	1x
Parathion methyl	59	Rape seed oil, Crude	0.2	5	Rape seed	0.05 (Step 5)	4x
Parathion methyl	59	Rape seed oil, Edible	0.2	5	Rape seed	0.05 (Step 5)	4x
Pyriproxifen	200	Cotton seed oil, Crude	0.1	8	Cotton seed	0.5 (Step 8)	0.2x
Pyriproxifen	200	Cotton seed oil, Edible	0.1	8	Cotton seed	0.5 (Step 8)	0.2x
Spinosad	203	Cotton seed oil, Crude	0.01	3	Cotton seed	0.01 (Step 3)	1x
Spinosad	203	Cotton seed oil, Edible	0.01	3	Cotton seed	0.01 (Step 3)	1x
Dimethepin	151	Cotton seed oil, Edible	0.1	3a	Cotton Seed	1 (Step 3a)	0.1x

* The Concentration ratio is the ratio of the processed food proposed CXL divided by the raw commodity CXL. Ratios greater than 1 indicate concentration occurs during processing, whereas those below 1 indicate residue is reduced during processing.

Attachment 4. List of Crops and Processed Commodities for which Existing CXLs were examined.

Fruits and derived processed foods or feeds

Pome fruits
Apples
Apple pomace, dry
Citrus fruits
Citrus pulp, dry
Dates
Dates, dried and candied
Dried fruits
Figs
Figs, dried or candied
Fruit Juices (none)
Grapes
Dried grapes
Raisins
Grapefruits
Lemons
Oranges, Sweet & Sour
Pear
Peach, dried
Plums (including prunes)
Tomatoes

Cereal grains and derived processed foods or feeds

Cereal grains
Maize
Maize oil, edible
Milled cereal products (early milling stage)
Milled cereal products
Rice
Rice, husked
Rice, Polished
Rice bran, Unprocessed
Rye
Rye flour
Rye whole meal
Wheat
Wheat germ
Wheat flour
Wheat whole meal
Wheat bran, unprocessed
Wheat bran, processed

White bread

Other foods and derived processed foods

Cotton seed
Cotton seed oil, crude
Cotton seed oil, edible
Olives
Olive oil, crude
Olive oil, edible
Oilseed
Peanut
Peanut oil, crude
Peanut oil, edible
Rape seed
Rape seed oil, edible (none)
Rape seed oil, crude
Sesame seed oil, edible (none)
Soya bean
Soya bean oil, crude
Soya been oil, refined
Sugar (none)
Sugar beet
Sugar beet molasses (none)
Sugar beet pulp, dry (none)
Sugar cane
Sunflower seed
Sunflower seed oil, crude
Sunflower seed oil, edible

Attachment 5. Established CXLs for Processed or Ready-to-Eat Foods

Note: Standard Codex annotations apply for temporary (T), Limit of Method (*), and Post-harvest (Po) CXLs.

I. Fruits

A. Pome Fruits / Apples

Chemical	No.	Type	Level (mg/kg)	Commodity	Comments *
Fenarimol	192	MRL	0.3	Pome fruits	
Fenarimol	192	MRL	5	Apple pomace, Dry	H
Fenbutatin Oxide	109	MRL	5	Pome fruits	
Fenbutatin Oxide	109	MRL	40	Apple pomace, Dry	H
Permethrin	120	MRL	2	Pome fruits	
Permethrin	120	MRL	50	Apple pomace, Dry	H
Propargite	113	MRL	5	Apple	
Propargite	113	MRL	80	Apple pomace, Dry	H

- 33 chemicals have CXLs for apple
- 38 chemicals have CXLs for pome fruit
- 4 chemicals have CXLs for apple pomace, dried

B. Citrus Fruits

Chemical	No.	Type	Level (mg/kg)	Commodity	Comments *
Fenbutatin Oxide	109	MRL	5	Citrus fruits	
Fenbutatin Oxide	109	MRL	25	Citrus pulp, Dry	H
Propargite	113	MRL	5	Citrus fruits	
Propargite	113	MRL	40	Citrus pulp, Dry	H

- 57 chemicals have CXLs for citrus fruits, oranges, grapefruits, or lemons.
- 2 chemicals have CXLs for citrus pulp, dry.
- 0 Chemicals have a CXL for orange or other citrus fruit juice.
- Therefore, 55 chemicals with CXLs for fruit in the citrus group do not have a dry citrus pulp MRL.

C. Grapes / Raisins

Chemical	No.	Type	Level (mg/kg)	Commodity	Comments *
Bromide Ion	47	MRL	(none)	Grapes	
Bromide Ion	47	MRL	100	Dried grapes (=currants, raisins and sultanas)	

Chemical	No.	Type	Level (mg/kg)	Commodity	Comments *
Chlorpyrifos	17	MRL	1	Grapes	
Chlorpyrifos	17	MRL	2	Dried grapes (=currants, raisins and sultanas)	H
Fenarimol	192	MRL	0.3	Grapes	
Fenarimol	192	MRL	0.2	Dried grapes (=currants, raisins and sultanas)	L
Fenbutatin Oxide	109	MRL	5	Grapes	
Fenbutatin Oxide	109	MRL	100	Grape pomace, Dry	H
Fenbutatin Oxide	109	MRL	20	Raisins	H
Flusilazole	165	MRL	0.5	Grapes	
Flusilazole	165	MRL	1	Dried grapes (=currants, raisins and sultanas)	H
Propargite	113	MRL	10	Grapes	
Propargite	113	MRL	40	Grape pomace, Dry	H
Propargite	113	MRL	10	Dried grapes (=currants, raisins and sultanas)	E
Penconazole	182	MRL	0.2	Grapes	
Penconazole	182	MRL	0.5	Dried grapes (=currants, raisins and sultanas)	H

- 51 chemicals have CXLs for grapes.
- 6 chemicals have CXLs for dried grapes.
- 1 chemical has a CXL for raisins.
- 1 chemical has a CXL for grape pomace, dry.
- 0 chemicals have a CXL for grape juice or wine.
- 45 chemicals that have a grape CXL do not have CXLs for processed grape fractions, including folpet (2 ppm), iprodione (10 ppm), phosmet (10 ppm), and procymidone (5 ppm).

D. Other Dried Fruits

Chemical	No.	Type	Level (mg/kg)	Commodity	Comments*
Bromide Ion	47	MRL	20	Fruits, except as otherwise listed	
Bromide Ion	47	MRL	250	Figs, Dried or dried and candied	H
Ethephon	106	MRL	(none)	Figs	
Ethephon	106	MRL	10	Figs, Dried or dried and candied	
Bromide Ion	47	MRL	20	Fruits, except as otherwise listed	

Chemical	No.	Type	Level (mg/kg)		Commodity	Comments*
Bromide Ion	47	MRL	100		Dates, Dried or dried & candied	H
Pirimiphos-Methyl	86	MRL	(none)		Dates	
Pirimiphos-Methyl	86	MRL	0.5	Po	Dates, Dried or dried & candied	
Bromide Ion	47	MRL	20		Fruits, except as otherwise listed	
Bromide Ion	47	MRL	50		Peach, Dried	H
Bromide Ion	47	MRL	20		Fruits, except as otherwise listed	
Bromide Ion	47	MRL	30		Dried fruits	H
Bromide Ion	47	MRL	20		Fruits, except as otherwise listed	
Bromide Ion	47	MRL	20		Prunes	E
Hydrogen Phosphide	46	MRL	(none)		Fruits	
Hydrogen Phosphide	46	MRL	0.01	Po	Dried fruits	
Malathion	49	MRL	2		Apple	
Malathion	49	MRL	4		Citrus Fruit	
Malathion	49	MRL	8		Grapes	
Malathion	49	MRL	8		Dried fruits	H, E
Pyrethrins	63	MRL	(none)		Fruits	
Pyrethrins	63	MRL	1	Po	Dried fruits	
Fenbutin Oxide	109		3		Plums, including prunes	
Fenbutin Oxide	109	MRL	10		Prunes	H
Diclofotol	26	MRL	1		Plums, including prunes	
Diclofotol	26	MRL	3		Prunes	H
Diazinon	22	MRL	1		Plums, including prunes	
Diazinon	22	MRL	2		Prunes	H
Myclobutanil			0.2		Plums, including prunes	
Myclobutanil		MRL	0.5		Prunes	H

- 14 chemicals have CXLs for dried fruits, dried figs, dried dates, prunes, or dried peaches.
- In 4 cases, there are no corresponding CXLs on the raw fruit commodity.
- Most relate to general crop group CXLs or post-harvest

Chemical	No.	Type	Level (mg/kg)	Commodity	Comments*
treatments.					
• 4 chemicals have CXLs for prunes and for plums (including prunes) that are inconsistent.					
• 3 chemicals have CXLs on figs or dates without corresponding MRLs on the dried commodities, including propargite (2ppm, figs).					

II. Cereals

A. Wheat Processed Fractions

Chemical	No.	Type	Level (mg/kg)		Commodity	Comments *
Bifenthrin	178	MRL	0.5	Po	Wheat	
Bifenthrin	178	MRL	2	PoP	Wheat bran, Unprocessed	H
Bifenthrin	178	MRL	0.5	PoP	Wheat whole meal	E
Bifenthrin	178	MRL	0.2	PoP	Wheat flour	L
Bioresmethrin	93	MRL	1	Po	Wheat	
Bioresmethrin	93	MRL	5	PoP	Wheat bran, Unprocessed	H
Bioresmethrin	93	MRL	3	PoP	Wheat germ	H
Bioresmethrin	93	MRL	1	PoP	Wheat flour	E
Bioresmethrin	93	MRL	1	PoP	Wheat whole meal	E
Bromide Ion	47	MRL	50		Cereal grains	
Bromide Ion	47	MRL	50		Wheat whole meal	E
Carbaryl	8	MRL	5	Po T	Wheat	(1999-2003)
Carbaryl	8	MRL	20	PoP T	Wheat bran, Unprocessed	H (1999-2003)
Carbaryl	8	MRL	0.2	PoP T	Wheat flour	L (1999-2003)
Carbaryl	8	MRL	2	PoP T	Wheat whole meal	L (1999-2003)
Chlorpyrifos-Methyl	90	MRL	10	Po	Wheat	
Chlorpyrifos-Methyl	90	MRL	20	PoP	Wheat bran, Unprocessed	H
Chlorpyrifos-Methyl	90	MRL	2	Po	Wheat flour	L
Chlorpyrifos-Methyl	90	MRL	0.5	PoP	White bread	L
Chlorpyrifos-Methyl	90	MRL	2	PoP	Whole meal bread	L
Deltamethrin	135	MRL	1	Po	Cereal grains	
Deltamethrin	135	MRL	5	PoP	Wheat bran, Unprocessed	H
Deltamethrin	135	MRL	1	PoP	Wheat whole meal	E
Deltamethrin	135	MRL	0.2	PoP	Wheat flour	L

Chemical	No.	Type	Level (mg/kg)		Commodity	Comments *
Dichlorvos	25	MRL	5	(Po)	Cereal grains	
Dichlorvos	25	MRL	10		Wheat bran, Unprocessed	H
Dichlorvos	25	MRL	10		Wheat germ	H
Dichlorvos	25	MRL	1		Wheat flour	L
Dichlorvos	25	MRL	2		Wheat whole meal	L
Diquat	31	MRL	2		Wheat	
Diquat	31	MRL	5		Wheat bran, Unprocessed	H
Diquat	31	MRL	2		Wheat whole meal	E
Diquat	31	MRL	0.5		Wheat flour	L
Fenitrothion	37	MRL	10	Po	Cereal grains	
Fenitrothion	37	MRL	20	PoP	Wheat bran, Unprocessed	H
Fenitrothion	37	MRL	2	PoP	Wheat bran, Processed	L
Fenitrothion	37	MRL	2	PoP	Wheat flour	L
Fenitrothion	37	MRL	5	PoP	Wheat whole meal	L
Fenitrothion	37	MRL	0.2	PoP	White bread	L
Fenvalerate	119	MRL	2	Po	Cereal grains	
Fenvalerate	119	MRL	5	PoP	Wheat bran, Unprocessed	H
Fenvalerate	119	MRL	2	PoP	Wheat whole meal	E
Fenvalerate	119	MRL	0.2	PoP	Wheat flour	L
Glyphosate	158	MRL	5		Wheat	
Glyphosate	158	MRL	20		Wheat bran, Unprocessed	H
Glyphosate	158	MRL	5		Wheat whole meal	E
Glyphosate	158	MRL	0.5		Wheat flour	L
Malathion	49	MRL	8	Po	Cereal grains	
Malathion	49	MRL	20	PoP	Wheat bran, Unprocessed	H
Malathion	49	MRL	2	PoP	Wheat flour	L
Malathion	49	MRL	2	PoP	Wheat whole meal	L
Methoprene	147	MRL	5	Po	Cereal grains	
Methoprene	147	MRL	10	PoP	Wheat bran, Unprocessed	H
Methoprene	147	MRL	5	PoP	Wheat whole meal	E
Methoprene	147	MRL	2	PoP	Wheat flour	L
Permethrin	120	MRL	2	Po	Cereal grains	
Permethrin	120	MRL	5	PoP	Wheat bran,	H

Chemical	No.	Type	Level (mg/kg)		Commodity	Comments *
					Unprocessed	
Permethrin	120	MRL	2	PoP	Wheat germ	E
Permethrin	120	MRL	2	PoP	Wheat whole meal	E
Permethrin	120	MRL	0.5	PoP	Wheat flour	L
Pirimiphos-Methyl	86	MRL	10	Po	Cereal grains	
Pirimiphos-Methyl	86	MRL	20	PoP	Wheat bran, Unprocessed	H
Pirimiphos-Methyl	86	MRL	2	PoP	Wheat flour	L
Pirimiphos-Methyl	86	MRL	5	PoP	Wheat whole meal	L
Pirimiphos-Methyl	86	MRL	0.5	PoP	White bread	L

- 58 chemicals have CXLs for wheat grain or cereal grains; 16 are for post-harvest treatment
- 15 chemicals have CXLs for wheat processing fractions; 12 are related to post-harvest use.
- 4 CXLs are for baked bread.
- 43 chemicals that have a cereal or wheat CXL do not have CXLs for processed wheat fractions, including chlormequat and the group of triazole fungicides.

B. Maize Processed Fractions

Chemical	No.	Type	Level (mg/kg)		Commodity	Comments *
Methoprene	147	MRL	5	Po	Cereal grains	
Methoprene	147	MRL	0.2 (*)	PoP	Maize oil, Edible	L

- 49 chemicals have CXLs for maize grain or cereal grains
- 1 chemical has a CXL for a maize processed fraction - maize oil.
- 45 chemicals that have a cereal or maize CXL do not have CXLs for processed wheat fractions, including 11 chemicals that have CXLs for post-harvest treatment in cereal grains.

C. Rye Processed Fractions

Chemical	No.	Type	Level (mg/kg)		Commodity	Comments *
Malathion	49	MRL	8	Po	Cereal grains	
Malathion	49	MRL	2	PoP	Rye flour	L
Malathion	49	MRL	2	PoP	Rye whole meal	L
Pirimiphos-Methyl	86	MRL	10	Po	Cereal grains	
Pirimiphos-Methyl	86	MRL	5	PoP	Rye whole meal	L

- 39 chemicals have CXLs for rye grain or cereal grains; 12 are for post-harvest treatment
- 2 chemicals have CXLs for wheat processing fractions; both are related to post-harvest use.
- 37 chemicals that have a cereal or rye CXL do not have CXLs for processed rye fractions, including chlormequat and ethephon.

D. Rice Processed Fractions

Chemical	No.	Type	Level (mg/kg)		Commodity	Comments *
Carbaryl	8	MRL	5	Po T	Rice	
Carbaryl	8	MRL	5	PoP T	Rice, Husked	E
Diquat	31	MRL	10		Rice	
Diquat	31	MRL	1		Rice, Husked	L
Diquat	31	MRL	0.2		Rice, Polished	L
Fenitrothion	37	MRL	10	Po	Cereal grains	
Fenitrothion	37	MRL	20	PoP	Rice bran, Unprocessed	H
Fenitrothion	37	MRL	1	PoP	Rice, Polished	L
Paraquat	57	MRL	10		Rice	
Paraquat	57	MRL	0.5		Rice, Polished	L
Pirimiphos-Methyl	86	MRL	10	Po	Cereal grains	
Pirimiphos-Methyl	86	MRL	20	PoP	Rice bran, Unprocessed	H
Pirimiphos-Methyl	86	MRL	2	PoP	Rice, Husked	L
Pirimiphos-Methyl	86	MRL	1	PoP	Rice, Polished	L
Vamidothion	78	MRL	0.2		Cereal grains	
Vamidothion	78	MRL	0.2		Rice, Husked	E
Carbofuran	96	MRL	(none)		Cereal RAC	
Carbofuran	96	MRL	0.2		Rice, Husked	
Fenthion	39	MRL	(none)		Cereal RAC	
Fenthion	39	MRL	0.05		Rice, Husked	
Iprodione	111	MRL	(none)		Cereal RAC	
Iprodione	111	MRL	10		Rice, Husked	
Parathion-Methyl	59	MRL	(none)		Cereal RAC	
Parathion-Methyl	59	MRL	1		Rice, Husked	
Propoxur	75	MRL	(none)		Cereal RAC	
Propoxur	75	MRL	0.1		Rice, Husked	
Tebufenozide	196	MRL	(none)		Cereal RAC	
Tebufenozide	196	MRL	0.1		Rice, Husked	

- 34 chemicals have CXLs for rice grain or cereal grains; 12 are for post-harvest treatment

Chemical	No.	Type	Level (mg/kg)	Commodity	Comments *
• 6 chemicals have CXLs for rice processing fractions; 3 are related to post-harvest use.					
• 5 additional chemicals have CXLs for "rice, husked" without a basic rice grain MRL.					
• Only 2 chemicals have CXLs for a rice milling fraction (rice bran, unprocessed)					

III. Other Processed Foods

A. Cotton Seed Oils

Chemical	No.	Type	Level (mg/kg)		Commodity	Comments *
Aldicarb	117	MRL	0.1		Cotton seed	
Aldicarb	117	MRL	0.01	(*)	Cotton seed oil, Edible	L
Amitraz	122	MRL	0.5		Cotton seed	
Amitraz	122	MRL	0.05		Cotton seed oil, Crude	L
Chlordane	12	EMRL	0.05		Cotton seed oil, Crude	Unintended comtaminant
Chlorpyrifos	17	MRL	0.05	(*)	Cotton seed	
Chlorpyrifos	17	MRL	0.05	(*)	Cotton seed oil, Crude	E
Cyhalothrin	146	MRL	0.02	(*)	Cotton seed	
Cyhalothrin	146	MRL	0.02	(*)	Cotton seed oil, Crude	E
Cyhalothrin	146	MRL	0.02	(*)	Cotton seed oil, Edible	E
Dicofol	26	MRL	0.1		Cotton seed	
Dicofol	26	MRL	0.5		Cotton seed oil, Crude	H
Dicofol	26	MRL	0.5		Cotton seed oil, Edible	H
Dimethipin	151	MRL	0.5		Cotton seed	
Dimethipin	151	MRL	0.1		Cotton seed oil, Crude	L
Dimethipin	151	MRL	0.02	(*)	Cotton seed oil, Edible	L
Endosulfan	32	MRL	1		Cotton seed	
Endosulfan	32	MRL	0.5		Cotton seed oil, Crude	L

Chemical	No.	Type	Level (mg/kg)		Commodity	Comments *
Fenpropathrin	185	MRL	1		Cotton seed	
Fenpropathrin	185	MRL	3		Cotton seed oil, Crude	H
Fenvalerate	119	MRL	0.2		Cotton seed	
Fenvalerate	119	MRL	0.1		Cotton seed oil, Crude	L
Fenvalerate	119	MRL	0.1		Cotton seed oil, Edible	L
Flucythrinate	152	MRL	1		Cotton seed	
Flucythrinate	152	MRL	0.2		Cotton seed oil, Crude	L
Flucythrinate	152	MRL	0.2		Cotton seed oil, Edible	L
Glyphosate	158	MRL	10		Cotton seed	
Glyphosate	158	MRL	0.05	(*)	Cotton seed oil, Crude	L
Glyphosate	158	MRL	0.05	(*)	Cotton seed oil, Edible	L
Methidathion	51	MRL	1		Cotton seed	
Methidathion	51	MRL	2		Cotton seed oil, Crude	H
Monocrotophos	54	MRL	0.1		Cotton seed	
Monocrotophos	54	MRL	0.05	(*)	Cotton seed oil, Crude	L
Paraquat	57	MRL	0.2		Cotton seed	
Paraquat	57	MRL	0.05	(*)	Cotton seed oil, Edible	L
Permethrin	120	MRL	0.5		Cotton seed	
Permethrin	120	MRL	0.1		Cotton seed oil, Edible	L
Profenofos	171	MRL	2		Cotton seed	
Profenofos	171	MRL	0.05	(*)	Cotton seed oil, Edible	L

- 34 Chemicals have cotton seed CXLs
- 13 chemicals have cotton seed oil, crude CXLs
- 10 chemicals have cotton seed oil, edible M CXLs
- 18 chemicals with cotton seed CXLs have none for processed oil fractions. These include acephate (2

Chemical	No.	Type	Level (mg/kg)		Commodity	Comments *
ppm), ethephon (2 ppm) , and parathion (1 ppm).						

B. Peanut Oils

Chemical	No.	Type	Level (mg/kg)		Commodity	Comments *
Aldicarb	117	MRL	0.2		Peanut	
Aldicarb	117	MRL	0.01	(*)	Peanut oil, Edible	L
Carbaryl	8	MRL	(none)		Peanut	
Carbaryl	8	MRL	2	T	Peanut, Whole	1999-2003
Fenvalerate	119	MRL	(none)		Peanut	
Fenvalerate	119	MRL	0.1		Peanut, Whole	
Phorate	112	MRL	0.1		Peanut	
Phorate	112	MRL	0.05	(*)	Peanut oil, Edible	L
Phorate	112	MRL	0.05	(*)	Peanut oil, Crude	L
Pirimiphos-Methyl	86	MRL	2	Po	Peanut	
Pirimiphos-Methyl	86	MRL	25	Po	Peanut, Whole	H
Pirimiphos-Methyl	86	MRL	15	PoP	Peanut oil, Edible	H
Pirimiphos-Methyl	86	MRL	15	PoP	Peanut oil, Crude	H
Propiconazole	160	MRL	0.5		Peanut	
Propiconazole	160	MRL	0.1		Peanut, Whole	H
Quintozene	64	MRL	2		Peanut	
Quintozene	64	MRL	5		Peanut, Whole	H

- 25 chemicals have CXLs for peanut.
- 3 chemicals have CXLs for peanut oil, edible.
- 2 chemicals have CXLs for peanut oil, crude
- 5 chemicals have CXLs for peanut, whole.
- 20 chemicals with peanut CXLs have no CXLs for processed oil or whole peanuts, including disulfoton (0.1 ppm), metalaxyl (0.1 ppm), and oxamyl (0.1 ppm).

C. Rape Seed Oils

Chemical	No.	Type	Level (mg/kg)		Commodity	Comments *
Glufosinate-Ammonium	175	MRL	5		Rape seed	
Glufosinate-Ammonium	175	MRL	0.05	(*)	Rape seed oil, Crude	L
Terbufos	167	MRL	0.05	(*)	Rape seed	

Chemical	No.	Type	Level (mg/kg)		Commodity	Comments *
Terbufos	167	MRL	0.05	(*)	Rape seed oil, Crude	E

- 21 chemicals have CXLs for rape seed
- 2 have CXLs for rape seed oil, crude
- 0 have CXLs for rape seed oil, edible
- Therefore, 19 chemicals with rape seed CXLs have no CXLs for rape seed oil, including cycloxydim (2 ppm), diquat (2 ppm), and vinclozolin (1 ppm).

D. Soya Bean Oils

Chemical	No.	Type	Level (mg/kg)		Commodity	Comments *
Chlordane	12	EMRL	0.05		Soya bean oil, Crude	
Chlordane	12	EMRL	0.02		Soya bean oil, Refined	L
Heptachlor	43	EMRL	0.5		Soya bean oil, Crude	
Heptachlor	43	EMRL	0.02		Soya bean oil, Refined	L
Permethrin	120	MRL	0.05	(*)	Soya bean, dry	
Permethrin	120	MRL	0.1		Soya bean oil, Crude	H
Profenofos	171	MRL	0.05	(*)	Soya bean, dry	
Profenofos	171	MRL	0.05	(*)	Soya bean oil, Refined	E

- 28 Chemicals have CXLs for soya bean, dry
- 3 chemicals have CXLs for soya bean oil, refined
- 3 chemicals have CXLs for soya bean oil, crude
- 26 chemicals with CXLs for soya bean, dry, do not have soya bean oil CXLs, including acephate (0.5 ppm), glyphosate (20 ppm), and oxamyl (0.1 ppm).

E. Sunflower Oils

Chemical	No.	Type	Level (mg/kg)		Commodity	Comments*
Dimethipin	151	MRL	0.5		Sunflower seed	
Dimethipin	151	MRL	0.1		Sunflower seed oil, Crude	L
Dimethipin	151	MRL	0.02	(*)	Sunflower seed oil, Edible	L
Glufosinate-Ammonium	175	MRL	5		Sunflower seed	
Glufosinate-Ammonium	175	MRL	0.05	(*)	Sunflower seed oil, Crude	L
Paraquat	57	MRL	2		Sunflower seed	

Chemical	No.	Type	Level (mg/kg)		Commodity	Comments*
Paraquat	57	MRL	0.05	(*)	Sunflower seed oil, Crude	L
Paraquat	57	MRL	0.05	(*)	Sunflower seed oil, Edible	L
Permethrin	120	MRL	1		Sunflower seed	
Permethrin	120	MRL	1		Sunflower seed oil, Crude	E
Permethrin	120	MRL	1		Sunflower seed oil, Edible	E
Procymidone	136	MRL	0.2		Sunflower seed	
Procymidone	136	MRL	0.5		Sunflower seed oil, Edible	H

- 14 Chemicals have CXLs for sunflower seed.
- 5 chemicals have CXLs for sunflower seed oils.
- 9 chemicals with CXLs for sunflower seed do not have oil CXLs, including diquat, iprodione, and methidathion.

F. Olive Oils

Chemical	No.	Type	Level (mg/kg)			Commodity	Comments *
Carbaryl	8	MRL	10		T	Olives	1999-2003
Carbaryl	8	MRL	1		T	Olives, Processed	L 1999-2003
Dimethoate	27	MRL	1			Olives	
Dimethoate	27	MRL	0.05	(*)		Olives, Processed	L
Dimethoate	27	MRL	0.05	(*)		Olive oil, Refined	L
Fenthion	39	MRL	1			Olives	
Fenthion	39	MRL	1			Olive oil, Virgin	E
Methidathion	51	MRL	1			Olives	
Methidathion	51	MRL	2			Olive oil, Virgin	H
Parathion	58	MRL	0.5			Olives	
Parathion	58	MRL	2			Olive oil, Virgin	H

- 9 Chemicals have CXLs for olives
- 5 chemicals have M CXLs for olive oils.
- 4 chemicals with CXLs for olives do not have oil CXLs, including paraquat and pirimiphos-methyl.

* Letters in the "Comments" column indicate if the CXL for the processed food is higher (H), equal to (E), or lower (L) than the CXL for the corresponding RAC.