codex alimentarius commission

FOOD AND AGRICULTURE ORGANIZATION OF THE UNITED NATIONS

WORLD HEALTH ORGANIZATION

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CONSIDERATION OF ELABORATION OF MRLS FOR SPICES

(Summary document prepared by South Africa)

BACKGROUND

1. At the 33rd Session the Committee considered CX/PR01/16 dealing with current uses of pesticides on spices, information on GAP, national policies for regulating residues in spices and the availability of residue trials and monitoring data. The Committee agreed that the Delegation of South Africa with assistance of Egypt, India, Indonesia and the spice trader associations would prepare a concise position paper to identify the more important spice/pesticide combinations, the availability of GAP information and residue data (field trials and monitoring data) together with information on trade problems. It was also agreed that the paper should consider policy guidance on further steps in the establishment of MRLs/EMRLs for spices. In response to the request of the Committee the spice trader associations prepared a background document (see Annex) incorporating information from India, Sri Lanka, other countries in the region and the International Trade Centre-UNCTAD/WTO in Geneva. Information from Egypt was also incorporated in this document.

2. In line with the recommendations of CCPR, the document focuses on "spices" as defined in Codex Commodity Group 028 of the "Codex Classification of Foods and Animal Feeds" and dried chili pepper. These commodities move in trade as dried commodities. The document also considers **only uses of pesticides in agricultural production**, before harvest. Post-harvest uses, where fumigants are generally used, are not included in the discussion and recommendations.

IMPORTANT SPICE/PESTICIDE COMBINATIONS

3. Spice plants are susceptible to attacks of pests and diseases. Although most spice exporting countries have implemented a pesticide registration system not one of the countries has established MRLs specifically on spices.

4. The Indian Spice Board can provide information on the most important spices exported from India and the pesticides used on them (see Annex). This information can be supplied for dried chili pepper, black pepper, coriander, cumin, fennel, and turmeric. An example is given in the Annex for pesticides used on peppers. Similar information can also be provided by Egypt for anise seed, careway, cumin, coriander, fennel seed and chili pepper (see Annex).

GAP AND RESIDUE DATA

5. Spices are produced primarily in developing countries, typically by small-holding (1 to 2 hectare plots) subsistence agriculture (see Annex). It is also often planted as inter-crops in other crops. Due to the large number of different spices available in the trade and the number of different pesticides that can be used for each spice it is not practical nor cost effective to conduct supervised trials and establish GAPs for each of these pesticide/spice combinations. Limited information is therefore available on GAP and there is a lack of field trial residue data.

6. Residue monitoring data for spices are available from the various spice trade associations in India, the USA, Europe and Egypt. Table 2 in the Annex provides information of the monitoring database on spices in Egypt for the year 2001. Egypt also has monitoring data for the years 1995 to 2000. In India, monitoring data are collected randomly before shipment while for the USA and Europe, data are collected at the port of arrival of spice shipments. These shipments come from different countries exporting spices. Table 3 in the Annex provides a summary of the monitoring database on spices in India. Information is given on the number of samples analysed and the pesticides found.

7. A number of persistent pesticides are no longer used on spices but are still detected on them(see Annex). This is as a result of the continued presence of these persistent pesticides in the environment. The contaminants database of WHO Gems/Food Programme shows that the main residues detected in a number of spices monitored were DDT, BHC and lindane. There is therefore a need to establish EMRLs for these persistent compounds. Members of the International Organization of Spice Trade Associations have monitoring data available from the USA, Europe, India, Japan and Australia. This data are being collated and can be made available to support the establishment of EMRLs.

TRADE PROBLEMS

8. Spices are grown in and exported almost exclusively from developing countries. UNCTAD records show that in 1993 developing countries accounted for 74% of the world's export in spices. The largest importers of spices are the USA, Europe, and Japan. FAO statistics show that spices constitute a relatively large percentage of the food exports of developing countries, while they account for only a very small percentage of food imports of developed countries (see Figure 1 and Appendix 2 of the Annex). Spices are regarded as small cash crops grown by small and marginal farmers, but are traded in bulk between developing and developed countries. Rejection of a shipment or batch of spices due to pesticide residues will inevitably affect small-holding farmers regardless of country.

9. In the USA and Europe the requirements for setting MRLs on spices are the same as those for other food commodities *viz.* supervised trials according to GAP. In the USA the spice MRLs are mainly for fumigants used as post-harvest treatments. For persistent organochlorines still detected in spice shipments (e.g. DDT, BHC and lindane) there are neither MRLs nor "action levels". In the EU the MRLs for a number of pesticides found on spices are now set at the LOD. With limited MRLs for pesticides on spices and limits set at the LOD trade disruptions are common (see Annex). Trade disruptions were recently reported involving Australia, the EU, Finland, Germany, Spain and the USA. An example is given for dried chili pepper. India experienced trade disruptions involving this commodity for the years 1999, 2000 and 2001 of 4.39, 5.7, and 6.12 million US dollars.

10. To overcome the problem of trade disruptions in the international spice trade there is an urgent need to establish Codex MRLs and EMRLs that can be used to facilitate fair practices in international trade while safeguarding consumer health and safety.

POSSIBLE OPTIONS

11. An alternative approach to the conventional method of setting MRLs based on supervised trials conducted in accordance to GAP should be explored for spices. Monitoring data from different sources could be used as basis for elaborating Codex MRLs. Because of the very low *per capita* consumption of spices, it is anticipated that there will be no dietary risks associated with residues in spices. This is confirmed by the results of the TMDI calculations showing that residues of all pesticides used on spices are well below the ADI (see Table 4 in the Annex).

12. The proposed use of monitoring data to establish Codex MRLs for pesticides should be limited to spices falling under the current Codex Commodity Group 028. If this approach is to be expanded in the future to other commodities moving in international trade the following parameters should apply:

- The *per capita* consumption of the food commodity must be less than 0.5% of the total diet in any WHO regional diet.
- The commodity is grown primarily in developing countries, in small-holdings (< 10 hectares) and the number of farmers cultivating the crop is more than one million.
- There is substantial trade of the commodity with more significant economic impacts to developing than developed countries.
- There are significant trade problems due to the lack of international standards.
- There is an ongoing residue monitoring programme on the commodity.
- The dietary risk is acceptable.

13. Residues of persistent pesticides which have been banned continue to be detected on spices e.g. DDT, BHC and lindane. These pesticides are not used on spices but are present in the environment. In these cases EMRLs could be established following current procedures in the JMPR/CCPR.

RECOMMENDATIONS

1. The Committee is invited to consider the proposed alternative approach to the setting of Codex MRLs for spices on the basis of monitoring data, as outlined in paragraphs 11 and 12 above.

2. The Committee is invited to 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.

Annex to CX/PR 02/12

CONSIDERATION FOR ELABORATION OF MAXIMUM RESIDUE LIMITS (MRLS) FOR SPICES

INTRODUCTION

1. This paper addresses the concerns raised in the last session of CCPR and suggests options to consider when establishing Codex MRLs for spices. In line with the recommendations of CCPR, the paper will concentrate on "spices" as defined in Codex Commodity Group 028 (Group Letter Code HS) of the "Codex Classification of Foods and Animal Feeds" as well as dried chili pepper (red chili). These commodities move in trade as dried commodities. Some herbs e.g. camomile, mint and marjoram are also used as spices. Although not included in the present paper it is suggested that their present commodity classification be reconsidered. The paper will focus only on the use of pesticides in agricultural production, before harvest. Post-harvest uses, where fumigants are generally used, will not be included in the discussion and recommendations.

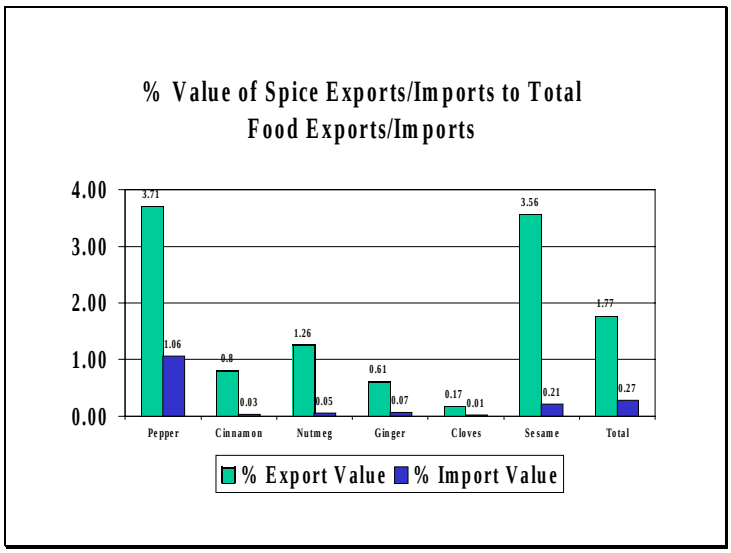
IMPORTANCE OF THE INTERNATIONAL SPICE TRADE TO DEVELOPING COUNTRIES

2. Spices are grown in and exported almost exclusively from developing countries. The United Nations Center for Trading and Development (UNCTAD) records show that in 1993, developing countries accounted for 74% of the world's exports in spices. Of these, 33% came from developing countries with per capita incomes of less than $1,000 (UNCTAD/WTO, 1993). Among the leading exporters are India, Indonesia, China, Madagascar, Turkey, Guatemala, Sri Lanka, Malaysia, United Arab Emirates, Iran, Vietnam, Comoros, Thailand, Pakistan, Egypt and Syria. Appendix 1 provides information on spice exports from Egypt. The Comoros, Grenada, Guatemala, Madagascar, Tonga, and Tanzania depend heavily on exports of spices for their foreign exchange earnings. The largest importers of spices are in the developed world: United States, Europe, and Japan (see Appendix 2).

3. Spices are regarded as small cash crops and are tended by small and marginal farmers. While grown in subsistence farming, spices are traded in bulk between the developing and developed world. Therefore, disruptions in trade that might have a small effect on the importing country can have very serious repercussions at the state and farmer level in the developing countries. If a farmer, who has a few bags of three different spices, loses a major market for one of them, one-third of his already meager income can be lost. This is especially true for tropical spices where all of the growing areas are similar in terms of rural subsistence agriculture. Rejection of a shipment or batch of spices due to, for example, pesticide residues, will inevitably affect small-holding farmers regardless of country.

4. Spices constitute a relatively large percentage of the food exports of developing countries, while they are only a very small percentage of food imports of the developed world. Figure 1 which utilizes the 1999 statistics from the FAO website (see Appendix 2) illustrates that spices even taken individually are at least ten times more important to the exporting countries than to the importing countries when viewed as percentage of the total food exports (excluding fish) of each country. Clearly, any action taken by the importing nations to affect the import of spices can have a greatly magnified effect on the exporting country (S. Abbott, 2001).

Figure 1. Importance of Spice Trade to Developing Countries



NATIONAL REGULATORY POLICIES AND INTERNATIONAL TRADE

5. In a review conducted by UNCTAD on the effects of the SPS Agreement on the spice trade industry, it is stated "regulations on pesticide residues are likely to become the single most important non-tariff barrier to trade in spices" (ITC-UNCTAD, 1996). Pesticide residues may remain on the spices even after processing. Many governments of importing countries have instituted regulations to control the amount of contamination from pesticide residues on spices imported. In both the United States and Europe, the requirements for setting MRLs are the same as those for any food commodity, i.e. the residue limits are set based on supervised trials according to an approved GAP (Good Agricultural Practice). The standard-setting method assumes large-scale, controlled productions.

6. In the United States, the tolerances are mainly for fumigants used for post-harvest treatment of spices. For persistent organochlorines still detected in spice shipments such as DDT, BHC or lindane, there are neither tolerances nor "action levels". In the EU, the MRLs for a number of pesticides found on spices are now set at the limit of determination (LOD). These levels, in effect, are equivalent to having no MRLs. In a subsequent section, it will be explained why such requirements are not applicable to spices. Meantime, with limited MRLs for pesticide residues on spices and, where available, limits set at the LOD, it is not surprising that trade disruptions often occur. Thus, under the circumstances, developing countries have no other recourse but to request the Codex Alimentarius Commission, the International standard-setting body for, among others, pesticide residues, to review the case of spices and establish international standards that can be used to facilitate fair practices in international trade while safeguarding consumer health and safety.

NEED FOR CODEX MRLS FOR PESTICIDES USED ON SPICES

14. Numerous trade disruptions have occurred over the years as a result of the lack of MRLs for spices. For example, Indian exporters of spices have suffered huge losses due to detention/rejection of their spice consignments by the importing countries on account of the alleged presence of pesticide residues. Dried chili pepper is the most affected item among the spices detained/rejected by the importing countries. The table below shows latest trade disruptions involving dried chili pepper from India (Indian Spice Board, 2001).

Table 1. Trade Disruptions Due to Pesticide Residues with no MRLs

Year	Item	Quantity (MT)	Value (Million US$)	Country of Import
1999	Dried chili pepper	30	4.39	USA
2000	Dried chili pepper	46.5	5.7	USA, Spain, Finland
2001	Dried chili pepper	55	6.12	Australia

7. 14. Spain has recently put dried chili pepper consignments under compulsory inspection with respect to the pesticide residues, as a result of which, exporting countries have lost this market for dried chili pepper. Export of other spices to this country has also been adversely affected.

8. The latest notifications in the EU Food Alert System show rejection of consignments of spices (mainly ground chili pepper) from Thailand or India due to residues of cypermethrin, ethion, dicofol, phosalone, etc. for which there were either no MRL or the MRL set at the LOD was exceeded. Curry powder, which is a mixture of spices, was rejected in Germany due to cypermethrin, fenvalerate and phosphamidon.

9. In 1996, the pesticide quinalphos was found in dried chili pepper from India. The U.S. FDA detained all lots and required re-export of contaminated lots, resulting in losses to India of about $1.1 million. The ability for India or any other developing country for that matter, to accept an entire crop year of exports back into the country and provide financial reimbursement is limited and could be devastating to the small farm holders. Similar scenarios have occurred practically annually with sesame seed, cumin seed, turmeric, and others. Considering the producers are small farm holders in developing countries that rely mainly on trade in spices for subsistence, the importance of establishing realistic residue limits for pesticides used on spices cannot be overemphasized.

10. There are many more consignments rejected due to pesticide residues than are recorded in government listings, since in many cases, it is the importing company itself that rejects the consignment at the point of shipment. The importing companies rely on national or international MRLs for these decisions.

SPICE PRODUCTION IN DEVELOPING COUNTRIES

11. Spices are grown primarily in developing countries. Production in these countries is at subsistence level agricultural operations. For example, India, which is one of the largest producers and exporters of spices, produces more than 3 million tons per annum in about 105 million smallholdings. Approximately 62 million of these smallholdings (59%) belong to marginal farmers that own less than 1 hectare of land and 20 million (10%) consist of farms of 1 to 2 hectares of land. Only 1.5% of these holdings represent areas with more than 10 hectares (Indian Spices Board, 2001).

12. A rural, small holding economy typifies the growing environment of spices in these countries. Not only are spices cultivated in 1 to 2 hectare plots, but also frequently they are grown as inter-crops. It is not unusual to find plots with several pepper vines, a nutmeg tree, three banana trees, tapioca bushes and cotton plants all growing in close proximity.

13. Black pepper is a case in point. In the largest producing state of India, Kerala, the Indian Spices Board indicates that "92.56% of the holdings, numbering some 5.01 million holdings," are less than one hectare. Another 5.19% are between one and two hectares. Large holdings (by Indian standards), i.e., greater than 10 hectares, represent only 0.05% of the total holdings. Because pepper is often an intercrop, it is subject to the pesticide practices that may be needed on the other crops though not needed for pepper. Since pesticides are expensive, however, this is somewhat self-limiting given the subsistence status of the farmers. One of the key differences between spices and other commodities considered for MRLs by the CCPR is this subsistence level of farming.

MAJOR PESTS AND DISEASES IN SPICES AND PESTICIDES USED

14. During cultivation, spice plants are susceptible to attacks of pests and diseases. The major insect pests on spices are: thrips, borers, grubs, whiteflies, caterpillars, beetles, scale insects, mites, and aphids. The common diseases are: fruit rot, leaf rot, basal wilt, leaf spot, clump rot, and rhizome rot. Spices are also attacked by a number of viruses. To control these pests and diseases, pesticides are used.

15. A review of regulations in some of the spice exporting countries shows that most countries have implemented a pesticide registration system. However, not one of the countries has established MRLs on spices. Label recommendations are mostly confined to major agricultural crops.

16. The Indian Spices Board has provided lists of pesticides used on some of the important spices exported from India: dried chili pepper, black pepper, coriander, cumin, fennel, and turmeric. Among these pesticides, the following are used for peppers: carbaryl, carbofuran, dicofol, dimethoate, endosulfan, fenitrothion, mancozeb, monocrotophos, oxydemeton-methyl (methyl demeton), phosalone, phosphamidon, and quinalphos. Only those pesticides used on peppers (black and dried chili) have some application recommendations; the rest do not. This has been the case for spices under subsistence agriculture, where there are typically no approved GAPs. Egypt has reported on the most important spice and pesticide combinations in that country. Details on these can be found in Table 2. Many developing countries are trying to move toward the use of GAPs in agriculture, but they are starting with larger crops that have higher intakes. Agriculture for spices, while very important to these countries, is likely to remain in the small holdings where it has been for centuries.

Table 2. Pesticide/spice combinations as detected during 2001 (monitoring database from Egypt)

Commodities and no. of samples	FREQUENCY	Pesticides
Anise seed (171)	1	carbaryl
	1	pirimiphos-methyl
	2	phosalone
	3	fenitrothion
	9	phenthoate
	11	dimethoate
	11	pirimicarb
	15	chlorpyrifos-methyl
	25	chlorpyrifos
	45	diazinon
	126	profenofos
	160	malathion
Caraway (164)	1	chlorpyrifos
	1	chlorpyrifos-methyl

Commodities and no. of samples	FREQUENCY	Pesticides
	1	pirimiphos-methyl
	5	dimethoate
	7	profenofos
	19	malathion
Cumin (188)	1	parathion methyl
	1	Parathion-ethyl
	1	phosalone
	1	tolclofos-methyl
	2	cyanophos
	2	omethoate
	4	methamidophos
	7	triazophos
	8	fenitrothion
	24	pyrazophos
	32	chlorpyrifos-methyl
	33	pirimicarb
	43	metalaxyl
	46	phenthoate
	76	dimethoate
	104	chlorpyrifos
	135	diazinon
	144	profenofos
	170	malathion
Coriander (250)	1	chlorpyrifos-methyl
	1	metalaxyl
	2	pirimicarb
	3	carbaryl
	3	Diazinon
	3	dimethoate
	5	chlorpyrifos
	11	profenofo
	23	malathion
Fennel seed (339)	1	metalaxyl
	1	triazophos
	2	fenitrothion
	3	phenthoate
	4	pirimiphos-methyl
	5	chlorpyrifos-methyl
	10	pirimicarb
	19	dimethoate
	20	chlorpyrifos
	28	diazinon
	65	profenofos
	255	malathion
Chili pepper (44)	1	Metalaxyl

Commodities and no. of samples	FREQUENCY	Pesticides
	2	chlorpyrifos-methyl
	2	profenofos
	3	chlorpyrifos

GAPS AND SUPERVISED TRIALS

17. Considering, (i) the production of spices is typified by small-holding subsistence agriculture in a number of different countries with a number of different regions in one country, (ii) the large number of various spice varieties available in trade, and (iii) the number of different pesticides that can be used for each spice, it does not seem possible to follow the conventional practice of establishing a GAP for each pesticide/spice combination. Further it would also not be practical and cost effective to conduct supervised trials for each of these pesticide/spice combinations.

18. In the example above from India, 12 different pesticides are used on dried red peppers to control the same group of pests. It is impossible to think that a minimum of 6 supervised trials would need to be conducted for each of these 12 pesticides on the same crop. The very little amount of pesticides used on dried red peppers will not interest the manufacturer of each of these 12 pesticides to conduct the required supervised trials. The cost of conducting these trials, which is prohibitive, will have to be shouldered by farmers themselves. In subsistence agriculture, farmers will not spend much-needed resources for this purpose.

19. The current system of MRL-setting assumes that a particular pesticide will be applied at a maximum prescribed rate and prescribed pre-harvest interval, resulting in anticipated residues. This system does not apply to subsistence farming where the residues may be linked to soil levels, water levels, and drift in addition to or instead of direct application.

AVAILABILITY OF MONITORING DATA

20. Monitoring data especially at the port of entry could be used to provide very real information to allow an MRL to be set that is reflective of actual world practice. The Delegation of India proposed this approach at the 33rd Session of the CCPR. India had indicated the availability of monitoring data to support this approach. Monitoring data from Egypt is also available for the period 1995 to 2001 (see Table 2 as an example of monitoring data during the period 2001). The representatives from the spice trade associations also confirmed the existence of monitoring data taken at the port of arrival of spice shipments. Monitoring data for spices are also available from the various spice trade associations in India, the USA, and Europe. Data are collected at the port of arrival of shipments and therefore come from different countries exporting spices. Dietary risk assessments can be made to evaluate the safety of the level set, since the pesticides mainly used on spices are those in which the JMPR had already set an acceptable daily intake. Table 3 provides the summary of the monitoring database on spice in India.

Table 3. Number of Samples Analyzed in the Monitoring Database in India

Spice	Pesticide Group		
	Organochlorines[1] (Dec '92 to 6.09.01)	**Organophosphorus[2] (10.01.94 to 06.09.01)**	**Pyrethroids[3] (01.01.99 to 06.09.01)**
Black pepper	674	273	3
Dried chili pepper	744	745	57
Ginger	51	26	-
Turmeric	199	68	2
Coriander	207	200	3
Cumin	202	167	1
Fennel seed	149	64	-
Curry powder	331	137	7
Total	2259	1680	73

[1] Heptachlor, aldrin, dieldrin, endrin, BHC (α, β, γ, δ, and total), DDT, endosulfan
[2] Dimethoate, disulfoton, ethion, chlorpyrifos, parathion-methyl, parathion, phorate, quinalphos
[3] Fenvalerate, cypermethrin

PESTICIDES NO LONGER USED BUT STILL DETECTED ON SPICES TRADED

21. Spice growing regions are often tropical, so pest control for both food production and public health is essential to the survival of the people. In India, mosquito-vector diseases, such as malaria and dengue fever, are still endemic. The use of DDT in agriculture was withdrawn by the Central Government effective 26th May 1989 (S.O. 378 (E)). At present, it is under the list, "Pesticide restricted for use" in India, with the type of restriction imposed given as "banned for use in agriculture". In very special circumstances warranting the use of DDT for plant protection, the State or Central Government may purchase it directly from Hindustan Insecticides Ltd., to be used under expert Government supervision. Use of DDT for the public health programs is limited to 10,000 metric tons per annum except in case of any major outbreak. The use of BHC in agriculture has also been banned effective 4 January 1997 (Indian Spice Board, 2001).

22. The contaminants monitoring database of WHO Gems/Food Programme shows that the main residues detected in a number of spices monitored were DDT, BHC, and lindane (Cheah, 1999). As previously noted, importing countries have no MRLs for residues of DDT, BHC and lindane on spices. However, these compounds have very long half-lives. As a result, residues will exist in the soil planted to spices and may contaminate the spice plants for many years to come even though not directly applied. Having no MRL in the developed world does not allow for the empirical and practical realities of subsistence agriculture in the developing countries. If these realities are not taken into account, the market access intended for the world's efficient producers will be eroded (UNCTAD, 1996). Members of the International Organization of Spice Trade Associations have the monitoring data to support such EMRLs.

HEALTH AND SAFETY CONSIDERATIONS

23. Because of the very low consumption of spices, it is anticipated that there will be no dietary risks associated with residues in spices. To confirm this, TMDI calculations were conducted for pesticides commonly used in spices using the WHO Gems/Food diets and the highest residue level from available spices monitoring databases. The highest residue level in all the spices using a particular pesticide was selected for the analysis. The ADIs were obtained from the latest WHO Toxicological Report (1999), except for BHC in which an ADI

has not yet been established, and the ADI for lindane was used in the analysis. Summary of the TMDI calculations are presented in Table 4.

Table 4. Estimated TMDI for Spices as a Percentage of the ADI based on the WHO Regional Diets

Pesticide	ADI	Residue	Middle Eastern	Far Eastern	African	Latin American	European
Acephate	0.03	0.2	0.03%	0.03%	0.02%	0.01%	0.01%
Chlorpyrifos-ethyl	0.01	3.29	1.37%	1.65%	0.99%	0.27%	0.27%
Diazinon	0.002	0.3	0.63%	0.75%	0.45%	0.13%	0.13%
Dimethoate	0.002	0.49	1.02%	1.23%	0.74%	0.20%	0.20%
Endosulfan	0.006	0.36	0.25%	0.30%	0.18%	0.05%	0.05%
Ethion	0.002	1.3	2.71%	3.25%	1.95%	0.54%	0.54%
Malathion	0.3	0.4	0.01%	0.01%	0.00%	0.00%	0.00%
Methamidophos	0.004	0.78	0.81%	0.98%	0.59%	0.16%	0.16%
Parathion	0.004	0.1	0.10%	0.13%	0.08%	0.02%	0.02%
Parathion-methyl	0.003	0.3	0.42%	0.50%	0.30%	0.08%	0.08%
Permethrin	0.05	2.9	0.24%	0.29%	0.17%	0.05%	0.05%
Phorate	0.0005	0.14	1.17%	1.40%	0.84%	0.23%	0.23%
Phosphamidon	0.0005	0.2	1.67%	2.00%	1.20%	0.33%	0.33%
Quintozene (PCNB)	0.01	1.25	0.52%	0.63%	0.38%	0.10%	0.10%
Triazophos	0.001	1.91	7.96%	9.55%	5.73%	1.59%	1.59%
Vinclozolin	0.01	0.13	0.05%	0.07%	0.04%	0.01%	0.01%
Aldrin (Revoked)	0.0001	0.08	3.33%	4.00%	2.40%	0.67%	0.67%
BHC – Total (Revoked)	0.001	4.58	19.08%	22.90%	13.74%	3.82%	3.82%
DDT – Total (Revoked)	0.01	5.1	2.13%	2.55%	1.53%	0.43%	0.43%
Dieldrin (Revoked)	0.0001	0.08	3.33%	4.00%	2.40%	0.67%	0.67%
Endrin (Revoked)	0.0002	0.03	0.63%	0.75%	0.45%	0.13%	0.13%
Heptachlor (Revoked)	0.0001	0.03	1.25%	1.50%	0.90%	0.25%	0.25%
Hexachlorobenzene	0.0001	0.04	1.67%	2.00%	1.20%	0.33%	0.33%
Lindane	0.001	0.5	2.08%	2.50%	1.50%	0.42%	0.42%

24. Results of the TMDI calculations show that residues of all pesticides used on spices are well below the ADI confirming that there are no dietary risks to residues of pesticides on spices.

CONCLUSIONS

1. In view of the very small consumption of spices, consumer health and safety problems are not expected; however, there continue to be problems in international trade due to the lack of national and Codex MRLs. Trade disruptions, due to the lack of international standards for pesticide residues on spices, continue to affect the main producers of these spices, the small farmers in developing countries; therefore, there is a need to establish Codex MRLs for spices.

2. Spices are grown in and exported almost exclusively from developing countries. They are typically cultivated as an inter-crop in small farm holdings averaging 1 to 2 hectares. From these small holdings, the harvested spices go through an elaborate market channel before it reaches the final exporter where yields from other farms all over the country are mixed together, processed and exported. Any disruption in trade, for whatever cause, can lead to serious repercussions affecting subsistence of small farmers. Such disruptions have been reported and can amount to losses in the millions of dollars.

3. The subsistence agricultural method of spice production in exporting countries, the large number of varieties of spices grown, and the different pesticides used to control pests and diseases in the spices, makes it close to impossible to establish one GAP for each pesticide/spice combination. It is even more difficult to conduct the required number of supervised trials to support these GAPs. Manufacturers who usually develop data to support MRLs have no interest in spending time or money to pursue these levels in spices, which use minute amounts of pesticides. The burden will fall on small subsistence farmers, who neither have the resources or technical expertise to do so.

PROPOSALS ON ALTERNATIVE OPTIONS

1. During the last CCPR session, Dr. Hermann (WHO) informed the Committee of the approach applied by Codex in the case of substances used for flavoring. These products are used in such minute quantities that it is unlikely that risks for consumers may occur. In these cases, a more general standard was deemed sufficient.

2. In the case of spices, an alternative approach to the conventional method of setting MRLs based on supervised trials conducted in accordance to the GAP should be explored. The most practical approach is the use of monitoring data to establish the MRLs for pesticides used on spices. From the monitoring data available from different sources, the maximum residue in any of the spices could be selected and used as basis for the MRL for all spices.

3. The proposed use of monitoring data to establish MRLs for pesticides should be limited to spices falling under the current Codex Commodity Group 028. In the future, if use of the approach is to be expanded, consideration should be given to limiting the application only to commodities that move in trade, where compliance to some parameters, such as the following are met:

- The per capita consumption is less than 0.5% of the total diet in any WHO regional diet.
- The commodity is grown primarily in developing countries, in small-holdings (<10 hectares) and the number of farmers cultivating the crop is greater than one million.
- There is substantial trade of the commodity with more significant economic impacts to developing vs. developed countries and large losses are experienced due to the lack of international standards.
- There is an ongoing monitoring of residues on the commodity.
- The dietary risk must be acceptable.

4. In addition to pesticides being used on spices, residues of persistent pesticides which have been banned continue to be detected; e.g. DDT, BHC, lindane. In these cases, EMRLs could be established following current procedures in the JMPR/CCPR.

APPENDIX 1

TOTAL EXPORTED VOLUME, EXPORT PRICE PER TON (US $) AND TOTAL PRICE EXPORTED CROP (US $) IN EGYPT 2000

Product	**Volume of exports in tons**	**Export price/ton US $**	**Total price exported crop US $**
Chili pepper	200	1400	280000
Coriander	9633	650	6261450
Cumin	200	3000	600000
Fennel seed	7000	750	5250000
Aniseed	1500	1500	2250000
Caraway	4000	1100	4400000
Liquorice root	6	1000	6000
Total	**22539**		**19047450**

Appendix 2

% VALUE OF SPICE EXPORTS/IMPORTS TO TOTAL FOOD EXPORTS/IMPORTS

COMMODITY/COUNTRY	EXPORT VALUE	TOTAL FOOD EXPORT VALUE	% EXPORT VALUE	IMPORT VALUE	TOTAL FOOD IMPORT VALUE	% IMPORT VALUE
PEPPER						
Brazil	87,448,000	8,469,463,000	1.03%			
India	287,000,000	2,422,375,000	11.85%			
Indonesia	191,241,000	3,058,969,000	6.25%			
Malaysia	106,783,000	5,578,612,000	1.91%			
United States				275,465,000	25,901,430,000	1.06%
Vietnam	103,000,000	1,392,267,000	7.40%			
TOTAL PEPPER	775,472,000	20,921,686,000	3.71%	275,465,000	25,901,430,000	1.06%
CINNAMON						
China	24,979,000	7,865,336,000	0.32%			
European Union				22,249,000	127,741,610,000	0.02%
Indonesia	21,319,000	3,058,965,000	0.70%			
Sri Lanka	49,436,000	202,593,000	24.40%			
United States				24,025,000	25,901,430,000	0.09%
Vietnam	4,500,000	1,392,267,000	0.32%			
TOTAL CINNAMON	100,234,000	12,519,161,000	0.80%	46,274,000	153,643,040,000	0.03%
NUTMEG, MACE, CARDAMOM						
Grenada	16,791,000	20,107,000	83.51%			
India	9,700,000	2,422,375,000	0.40%			
Indonesia	42,631,000	3,058,965,000	1.39%			
United States				12,426,000	25,901,430,000	0.05%
TOTAL NUTMEG, MACE….	69,122,000	5,501,447,000	1.26%	12,426,000	25,901,430,000	0.05%
GINGER						
China	55,105,000	7,865,336,000	0.70%			
India	9,819,000	2,422,375,000	0.41%			
Jamaica	240,000	191,135,000	0.13%			

Nigeria	820,000	353,244,000	0.23%			
United States				17,488,000	25,901,430,000	0.07%
TOTAL GINGER	65,984,000	10,832,090,000	0.61%	17,488,000	25,901,430,000	0.07%
CLOVES						
Brazil	946,000	8,469,463,000	0.01%			
Indonesia	1,635,000	3,058,965,000	0.05%			
Madagascar	17,126,000	53,841,000	31.81%			
United States				2,710,000	25,901,430,000	0.01%
TOTAL CLOVES	19,707,000	11,582,269,000	0.17%	2,710,000	25,901,430,000	0.01%
SESAME						
Guatemala	22,000,000	698,943,000	3.15%			
India	89,000,000	2,422,375,000	3.67%			
United States				53,240,000	25,901,430,000	0.21%
TOTAL SESAME	111,000,000	3,121,318,000	3.56%	53,240,000	25,901,430,000	0.21%
GRAND TOTAL	1,141,519,000	64,477,971,000	1.77%	407,603,000	153,643,040,000	0.27%

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