

codex alimentarius commission



FOOD AND AGRICULTURE
ORGANIZATION
OF THE UNITED NATIONS

WORLD
HEALTH
ORGANIZATION



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Agenda Item 8

CX/PR 10/42/10
April 2010

JOINT FAO/WHO FOOD STANDARDS PROGRAMME **CODEX COMMITTEE ON PESTICIDE RESIDUES**

42nd Session
Xian, China, 19 - 24 April 2010

DISCUSSION PAPER ON THE EXTRANEIOUS MAXIMUM RESIDUE LIMITS FOR PERSISTENT ORGANIC POLLUTANTS (POPS) FALLING WITHIN THE STOCKHOLM CONVENTION AND THE TERMS OF REFERENCE OF THE CODEX COMMITTEE ON PESTICIDES RESIDUES

Prepared by the Electronic Working Group Led by India and Co-chaired by Australia and New Zealand

INTRODUCTION

1. The Codex Committee on Pesticide Residues (CCPR) makes recommendations to the Codex Alimentarius Commission (CAC) with respect to the setting of both MRLs and EMRLs¹. The EMRL is the maximum concentration of a pesticide residue that is recommended by the CAC to be legally permitted or recognized as acceptable in or on a food agricultural commodity or animal feed. Where requested, the Joint Meeting on Pesticides (JMPR) proposes EMRL options which are subsequently considered by the CCPR.
2. EMRLs are distinguished from maximum residue limits (MRLs) in that the latter are based on residues resulting from supervised field trials reflecting nationally approved good agricultural practices (GAP) whereas EMRLs are based on historical monitoring data. While monitoring data is appropriate for exposure modeling, because of its non targeted nature, it will not reflect the full range of values or trends that may be seen over time due to changes in land use, significant environmental events (eg droughts) or for animal products the full range of individual animal variability.
3. EMRLs are established only for those compounds whose registration for agricultural uses had been revoked. Accordingly, the major risk management option has already been undertaken.
4. In essence, they are levels that still may be expected to be found in foods resulting from residual amounts of the parent compound and or its metabolites persisting in the environment long after the compound is no longer used in agriculture.

¹ An **Extraneous Maximum Residue Limit (EMRL)** refers to a pesticide residue or a contaminant arising from environmental sources (including former agricultural uses) other than the use of a pesticide or contaminant substance directly or indirectly on the commodity.

5. Accordingly, EMRLs are only established where either a JMPR assessment concludes that the levels and prevalence still being found do not pose a potential health risk and/or where the establishment of a level is necessary to prevent trade problems.

6. “Persistent Organic Pollutants” (POPs) are substances/chemicals that persist in the environment, accumulate and bio-magnify through the food web, to pose a risk of causing adverse effects to human health and the environment”.

7. In 1995, the Governing Council of the United Nations Environment Programme (UNEP) called for global action to be taken on POPs. Following this, the Intergovernmental Forum on Chemical Safety (IFCS) and the International Programme for Chemical Safety (IPCS) prepared an assessment of the 12 chemicals with an additional 9 new chemicals added to the list in 2009. The chemicals are grouped into three annexes.

8. In Annex A (Elimination), parties must take measures to eliminate the production and use of the chemicals listed under Annex A. Specific exemptions for use or production are listed in the Annex and apply only to Parties that register for them. Annex A includes: aldrin, chlordane, chlordecone, dieldrin, endrin, heptachlor, hexabromobiphenyl, hexabromodiphenyl ether and heptabromodiphenyl ether, hexachlorobenzene (HCB), alpha-hexachlorocyclohexane, beta-hexachlorocyclohexane, lindane, mirex, pentachlorobenzene, polychlorinated biphenyls (PCB), tetrabromodiphenyl ether and pentabromodiphenyl ether and toxaphene (camphechlor).

9. For compounds in Annex B (Restriction) parties must take measures to restrict the production and use of the chemicals listed under Annex B in light of any applicable acceptable purposes and/or specific exemptions listed in the Annex. Annex B includes: DDT, perfluorooctane sulfonic acid, its salts and perfluorooctane sulfonyl fluoride.

10. Annex C (Unintentional production). Parties must take measures to reduce the unintentional releases of chemicals listed under Annex C with the goal of continuing minimization and, where feasible, ultimate elimination. Annex C includes: polychlorinated dibenzo-p-dioxins (PCDD), polychlorinated dibenzofurans (PCDF), hexachlorobenzene (HCB), pentachlorobenzene, and polychlorinated biphenyls (PCB).

11. The Codex Alimentarius Commission (CAC) had established a number of Maximum Residue Limits and Extraneous Maximum Residue Limits(EMRLs) which fall under the Stockholm convention as specified below.

CODEX EMRLS FOR THE POPs

	Aldrin & Dieldrin	Chlordane	DDT	Endrin	Heptachlor	Lindane ² (MRLs)
Bulb vegetables	0.05					
Cereal grains	0.02					
Citrus fruits	0.05				0.01	
Eggs	0.1	0.02	0.1		0.05	0.01 (*)
Fruiting vegetables, Cucurbits	0.1	0.02(*)		0.05		
Leafy vegetables	0.05					
Legume vegetables	0.05					
Edible offal (mammalian)						0.01 (*)
Meat (from mammals other than marine mammals)	0.2 (fat)	0.05(fat)	5(fat)(T)		0.2 (fat)	0.1 (fat)
Milks	0.006(F)	0.002(fat)	0.02(fat)		0.006 F	0.01 (*)

² Currently lindane has MRLs set, rather than EMRLs

Pome fruits	0.05					
Poultry edible offal						0.01 (*)
Poultry meat	0.2 (fat)	0.5 (fat)	0.3(fat)	0.1(fat)	0.2 (fat)	0.05 (fat)
Pulses	0.05					
Root and tuber vegetables	0.1					
Almonds		0.02				
Cotton seed oil,Crude		0.05				
Hazelnuts		0.02				
Linseed oil, Crude		0.05				
Barley						0.01 (*)
Maize		0.02				0.01 (*)
Oats		0.02				0.01 (*)
Pecan		0.02				
Rice, Polished		0.02				
Rye		0.02				0.01 (*)
Sorghum		0.02				0.01 (*)
Soya bean oil, Crude		0.05			0.5	
Soya bean oil, Refined		0.02			0.02	
Sweet corn kernels						0.01 (*)
Walnuts		0.02				
Wheat		0.02				0.01 (*)
Carrot			0.02			
Cereal grains			0.1		0.02	
Cotton seed					0.02	
Pineapple					0.01	
Soya bean (immature seeds)					0.02	
Straw and fodder dry of cereal grains						0.01 (*)

12. On the advice of the Codex Alimentarius Commission (CAC), the Codex Committee on Pesticide Residue (CCPR) deliberated the issue of status of EMRLs of POPs in its 41st meeting held at Beijing, China. The Committee noted that the CAC had established a number of EMRLs in the past for pesticides whose agricultural use has been phased out under the Stockholm Convention on Persistent Organic Pollutants (POPs).

13. Some delegations were of the view that Codex EMRLs for POPs were necessary for trade purposes and should be retained for some time. Due to their persistent nature they were still present in the environment and as a consequence in food, despite the fact that POPs are not being used for plant protection anymore. However, some delegations were of the view that there was possibly a need for revision of these EMRLs based on new monitoring data because their data indicate that levels of POPs were decreasing in foods.

14. After detailed discussion the CCPR agreed, by means of a Circular letter (CL), to seek monitoring data for POPs from countries which fall under the Stockholm Convention and that are within the CCPR terms of reference not only for commodities for which Codex EMRLs were established, but also in other food items. Countries are requested to provide the monitoring data and additional information on methods of analysis using the GEMS/Food format.

15. The Committee also established an Electronic Working Group (EWG) (working in English only). This EWG is chaired by India and jointly co-chaired by Australia and New Zealand. Based on information received in response to the above CL, a paper containing proposals on how to deal with this issue for consideration by the

next session of the Committee is to be prepared. The Committee requested this EWG to make a provisional evaluation of the monitoring data in order to make more-informed decision at the next session.

WORKING OF EWG

16. In June 2009, a first circular letter was sent by Codex secretariat to all Codex Contact Points and interested International Organizations with a request for comments on the Persistent Organic Pollutants (POPs) by 15 September, 2009. In response to this request, Australia, Brazil, European Commission (Poland & Spain), France, Germany, India, New Zealand, Slovakia, United Kingdom and USA responded with data / comments. A second request letter was sent requesting that member countries participate in the EWG. In response to this, Australia, Iran, Japan, Republic of Korea, Poland, South Africa, St.Vincent, Thailand, The European Community, and USA expressed their interest in being associated with the group. In addition, Crop life International, International Organization of Vine and Wine (OIV) and International Council of Beverages Association (ICBA) also showed their interest in participating in the EWG.

17. The data submitted by the above mentioned Countries were compiled and annexed. The data were analysed and the summary of observations are described herein. However the data provided by Slovakia and France were not used. The Slovakian data had nomenclature of commodities in a language other than English. Further the compiled data could not be fitted to the common format used by the EWG. Hence Slovakia advised EWG not to use their data. Similarly the French electronic data could not be opened initially and subsequently there was difficulty in putting their data in common format. Brazil opined that since the 1980s, the agricultural use of hexachlorobenzene (HCB), aldrin, chlordane, DDT, dieldrin, endrin, heptachlor, mirex and toxaphene was banned. The use of these compounds in public health campaigns has been banned since the 1990s. Brazil has a monitoring programme for these pesticides in animal and vegetable products. No residue above the EMRLs set by Codex has been found. Brazil considers maintaining the Codex EMRLs after revision of their levels.

18. Residue monitoring data received from all countries were analysed and a report of their summary including a draft report was sent to the both co-chairpersons (Australia and New Zealand). Australia while providing its comment suggested that instead of commodity wise analysis, it is better to have pesticide-wise analysis and also a format for facilitating analysis was also suggested. This was echoed by New Zealand. Since the format suggested was simple and easy to analyse, the countries were requested to reformat their data. Australia, New Zealand, UK and India provided data in the new format. The Chairperson attempted to fit the data of the remaining countries into the common format. However wherever that was not possible, the analysis was done on the basis of the available data sets.

19. After the data are analysed the draft prepared in consultation with both Co-chairs (Australia and New Zealand) and the same was circulated to all members of the EWG. Besides Australia, New Zealand and India; USA, Thailand, South Africa and International Crop life provided comments on the report. After due cognizance given to their comments the final report has been prepared.

RESIDUE MONITORING DATA

20. The occurrence of residues has implications for the dietary risk assessment associated with POPs and also the potential to affect trade. Residues detected in monitoring data may suggest a trade related tolerance may be required. The percentage of detections reported in individual surveys conducted by different countries is a function of both historical (past) use of the different compounds and also the limit of reporting used in the surveys, a lower limit of reporting will potentially lead to increased detections.

VEGETABLES

21. Monitoring results for residues of POPs in vegetables were provided. Data for summer and winter squash are reported separately as vegetables in the family cucurbits generally have higher residues of POPs.

22. Monitoring of Vegetable samples for DDT residue was undertaken in India, USA, and Germany. In Poland and Spain the residue was estimated in both vegetables and fruits together. India has a non-statistically based, nation-wide study whereas the other two countries provided statistically-based data with representation of the whole country. Indian samples were monitored in two phases, one between October 2006 to October 2007 and the other between November 2007 to October 2008. In first phase the presence of DDT residue was seen in 0.74% samples (range being 0.01 to 3.46 mg/kg) whereas in the 2nd phase it was seen in 1 % of sample (range being 0.01 to 0.391 mg/kg). The American study pertains to the period 2004-08, showing the presence of DDT in 8.4% samples ranging from 0.002 to 0.045 mg/kg. The German study related to 2000-09 when 17100 samples were analyzed revealing the presence of DDT residue in range of 0.02 to 8.92 mg/kg. However, the number of samples showing the presence of DDT residue out of total samples analyzed was not mentioned. The Polish study relates to 2004-08 whereas Spain did analysis during 2005-07. In Poland 4.3% vegetables are having DDT residue in the range of 0.002 to 0.018 mg/kg. In Spain 0.1% samples found to have the same in the range of 0.001 to 0.003 mg/kg. No Codex EMRL has been prescribed.
23. Presence of total HCH as well as Hexachlorobenzene was studied in India and USA. The periodicity of sampling remained the same for both the countries as those for DDT. 1st phase of study in India showed the presence of HCH residue in 0.8% samples (range being 0.01 to 0.78 mg/kg), whereas presence in 2nd phase are having 1.6% samples (range being 0.01 to 2.327 mg/kg). USA study showed presence of Hexachlorobenzene in only 0.57% of samples at the level of 0.0023 mg/kg. No EMRI has been prescribed for total HCH.
24. Monitoring of residue of Chlordane was undertaken by USA and Germany during 2004-08 and 2000-09 respectively. The US data showed 0.43% of vegetables are having presence of Chlordane residue ranging from 0.0012 to 0.0075 mg/kg. In case of Germany, 412 samples were tested and found to be in range or 4 to 9.7 mg/kg. As the Codex EMRL is 0.02 ppm, the samples from Germany are much above EMRL, but in USA it is within EMRL limits.
25. The Codex residue definition for aldrin and dieldrin is the sum of both compounds. Aldrin and Dieldrin were estimated separately in India and Germany while in Poland and Spain the data was for the combined estimation of these pesticides. In USA, Dieldrin alone has been estimated. India undertook this study during November, 2007 to October, 2008 on a country wide basis. Only on 0.08% samples, the aldrin residue was found in the range or 0.078 to 0.28 mg/kg as against the prescribed Codex EMRL 0.05 mg/kg. All three samples(0.08%) are above EMRL. 1.2% samples fell in the range of 0.005 to 0.03 mg/ kg in a study for Dieldrin by USA between 2004-08.
26. Germany undertook study for Aldrin and Dieldrin individually between 2000-01 in 6387 and 23619 samples respectively revealing presence of these residues between 2-5 mg/kg and 1 to 8.1 mg/kg respectively. The presence of residue is much above the Codex EMRL.
27. Poland estimated Aldrin and Dieldrin residue during 2004-08 and found 0.96% of samples in range of 0.001 to 0.009 mg/kg. Study by Spain during 2005 showed these residues in 0.018% of samples at 0.01 mg/kg which is much less than Codex EMRL.
28. Vegetables were analyzed for Endrin residues by USA during 2004-08 and by Germany during 2000-09 respectively. USA studies showed residue ranging from 0.007 to 0.013 mg/kg in 0.96% samples with Endrin. In Germany 6172 samples were analyzed and Endrin residue was found in the range of 1.5 to 7 mg/kg. Poland found in 0.65% of samples contaminated in range of 0.007 to 0.03 mg/kg during 2004-08. However no EMRL has been prescribed by Codex for Endrin.
29. Heptachlor was estimated in vegetable sample by USA, Germany, and Poland during 2004-08 and 2000-09 and 2004-08 respectively. USA encountered in 1% samples in the range of 0.007 to 0.026 mg/kg. Germany found in 717 samples in the range of 1.92 to 6.71 mg/kg whereas Poland found 0.53% of samples having these residue in the range of 0.001 to 0.004 mg/kg. No Codex EMRL has been prescribed for Heptachlor in vegetables.

SUMMER SQUASH (COURGETTES, ZUCCHINI)

30 USA monitored Summer Squash during 2006-08 for Chlordane (2364, samples), Dieldrin (1718 samples), Heptachlor (914 samples) and Endrin (1348 samples). It was found that out of those samples 3.3% samples found to have chlordane residue in the range of 0.003 to 0.0029 mg/kg, 12% samples with Dieldrin in the range on 0.005 to 0.18 mg/kg, 3.2% samples with Heptachlor in range of 0.003 to 0.046 mg/kg and 1.9% samples with Endrin residue in range of 0.007 to 0.0044 mg/kg. Monitoring of DDT (T) residue in a 1022 samples done during 2007 revealed its presence in only 1.3% samples at the level of 0.007 mg/kg. Monitoring of 96 samples of Courgettes & Marrows during 2008 by the UK revealed Dieldrin residue in the range of 0.002 to 0.03 mg/kg. Codex EMRLs have been established for fruiting vegetables, cucurbits for aldrin/dieldrin (0.1 mg/kg), chlordane (0.02(*) mg/kg) and endrin (0.05 mg/kg).

WINTER SQUASH (PUMPKIN)

31. USA monitored the winter Squash for Chlordane (3099 samples), Dieldrin (1133 samples) and Heptachlor (1391 samples) during 2004-06, where as for DDT (943 samples) during 2004-08 and for Hexachlorobenzene (215 samples) during 2009, Out of the samples tested it was found that 2% of samples have residue of Chlordane in the range of 0.003 to 0.025 mg/kg, DDT-T (1.1%) in the range of 0.007 to 0.034 mg/kg, Dieldrin (7.6%) in the range of 0.01 to 0.2 mg/kg, Heptachlor (1.58%) in the range of 0.006 to 0.059 mg/kg and hexachlorobenzene at the level of 0.003 mg/kg. Codex EMRLs have been established for fruiting vegetables, cucurbits for aldrin/dieldrin (0.1 mg/kg), chlordane (0.02(*) mg/kg) and endrin (0.05 mg/kg).

FRUITS

32. Analyses of exclusive fruits for residue of certain POPs were undertaken in India, USA and Germany. Out of 1726 samples analyzed between November, 07 to October, 08 in India only 5 samples (0.28%) found to be having DDT (T) residue in the range of 0.0108 to 0.409 mg/kg. In USA only 0.56% samples were having DDT (T) residue studied during 2000-09 at the level of 0.007 mg/kg. Germany analyzed 16106 samples during 2000-09 and found residue in the range or 1 to 6.35 mg/kg. No Codex EMRL has been prescribed for DDT in fruits.

33. As regard HCH -T studies between Nov. 2007 to Oct. 2008, India found residue in the range of 0.01 to 2.327 mg/kg in 1.6% samples. No other country analyzed fruit for HCH-T. There are no Codex MRLs for HCH-T.

34. Heptachlor was analyzed during November, 07 to October, 08 by India and during 2000-09 in USA and Germany. Indian data show the Heptachlor residues in the range of 0.0214 to 0.01435 mg/kg in only 0.1% samples. USA study revealed the presence of Heptachlor residue at level of 0.007 mg/kg in only one samples out of 668 samples studied. Germany analyzed 769 samples and found residue in the range of 2.0 to 6.43 mg/kg. No Codex EMRL has been prescribed except on citrus fruit and pineapples, both of which are set at 0.01 mg/kg. It shows that German and Indian fruit samples had more than Codex EMRL of Heptachlor.

35. Residues for Dieldrin analysis in fruits were conducted only by USA during 2005 and Germany during 2000-09. USA found residue in 1 out of 114 sample studies at the level of 0.005 mg/kg. Germany analyzed 22248 samples during the period and Dieldrin residue was present between 1 to 5 mg/kg which is above Codex prescribed EMRL of 0.05 mg/kg for pome and citrus fruit.

36. During 2000 to 2009 Germany analyzed fruit samples for Aldrin (12547 sample), Chlordane (1787 samples), Endrin (9739 samples) and Mirex (2025 samples). Aldrin residue was found at the level of 5 mg/kg which is much above the prescribed Codex EMRL of 0.05 mg/kg for pome and citrus fruit.

37. Chlordane was in the range of 1 to 8 mg/kg though no Codex EMRL has been established for fruit. Though no Codex EMRL for Endrin and Mirex has been prescribed for fruits, residue at the level of 2-7 mg/kg and 6 mg/kg respectively were found.

DRY FRUITS

38. Germany only monitored the dry fruits for DDT-T (306 samples) and for Dieldrin (41 samples) during 2000-09 and revealed the presence at the range of 1.1 to 1.2 mg/kg and level of 7 mg/kg respectively.

FRUIT JUICE

39. Monitoring of fruit juice by Germany for Aldrin (884 samples), DDT-T (112 samples) and Dieldrin (2331 samples) during 2000-09 found to have the presence of these residues in the level of 5 mg/kg, 0.266 mg/kg and 5-6 mg/kg respectively. No Codex EMRL has been prescribed.

CEREAL GRAINS

40. The monitoring of cereal grains was undertaken by India, USA and Germany. In India the monitoring was done between Nov. 07-to Oct. 08 for HCH (T) and DDT(T) in 555 and 556 samples respectively HCH(T) was found in 2.7 % samples in the range of 0.012 -0.24 mg/kg where as DDT (T) was found only in one sample at level of 0.02 mg/kg. The residue of DDT was found to be less than the prescribed Codex EMRL of 0.1 mg/kg for cereal grain. USA monitored for DDT in 3799 samples during 2004-08 and found to have residue in 0.55 % samples in the range of 0.02 to 0.005 mg/kg which is much less than the Codex EMRL of 0.1 mg/kg for cereal grain. Monitoring for Dieldrin and Heptachlor residue during that period in 616 and 1300 samples was found that only in 0.6% and 0.15% samples are having residue at the level of 0.004 and 0.008 mg/kg respectively. However these are much less than the prescribed Codex EMRLs of 0.02 mg/kg for cereal grain for both compounds. German monitoring sample study undertaken during 2000-2009 for Aldrin, DDT (T) and Dieldrin in 550, 2326 and 867 samples revealed that the residue levels have exceeded the Codex EMRLs. These were in the range of 1-5, 2.2 -5 and 1-5 mg/kg.. Poland analysed cereal grain samples for Aldrin and Dieldrin (1003 samples), DDT (622 samples), Endrin (592 samples) and Heptachlor (549 samples). Out of these samples 1.3%, 0.9%, 0.67% and 4.3% of samples were found to have residue at the level of 0.004, 0.018, 0.004 and 0.006 mg/kg respectively. None of them have exceeded the relevant Codex EMRLs wherever prescribed..

OIL (OLIVE OIL, SOYBEAN OIL, RAPE SEED OIL ETC)

41. Germany monitored oil for chlordane (350 samples), DDT-T (823 samples), Dieldrin (705 samples) and Endrin (224 samples) during 2000-09 and revealed the residue of these pesticides at the level of 0.012-4 mg/kg, 1.12 to 7.81 mg/kg, 1 to 6.4 mg/kg and 5 mg/kg respectively. No Codex EMRL has been prescribed for this commodity.

TEA

42. Germany undertook monitoring study of tea for Chlordane (1070 samples), DDT-T (2026 samples), Dieldrin (1461) samples), Endrin (1603 samples) and Heptachlor (1238 samples) during 2000-09 and found the residue at level of 0.02 to 2.3 mg/kg, 0.98 to 2.22 mg/kg, 7-8 mg/kg, 2-4 mg/kg and 1.92 to 9.6 mg/kg respectively. No Codex EMRL has been prescribed for tea. Indian study on tea also did not found any residue of DDT above LOR.

43. Apart from this water sample have also been monitored by India and Germany and found to have presence of DDT, Dieldrin, Heptachlor and HCH at various levels. The details are in Annexure.

ANIMAL MEAT

44. India analyzed 200 meat samples of all origin during Nov-07 to Oct -08 and found 8%, 13% and 1% of Samples having residue with HCH, DDT and Heptachlor in the range of 0.011 to 1.0, 0.01 to 0.151 and 0.013 to 0.014 mg/kg. None of them are above the prescribed Codex EMRL of 5 (fat) mg/kg for DDT and 0.2 (fat) mg/kg for Heptachlor. Australia analyzed 2715 samples during 2004-08 of which only 0.13% samples are found to have residue of Aldrin and Dieldrin in the range of 0.24 to 1.3 mg/kg which are above the Codex EMRL of

0.2 mg/kg. 4386 samples of Ovine analyzed between 1999-2009 for Aldrin/ Dieldrin and 5831 samples for DDT showed their presence as residue in 0.25% and 0.72% of samples in the range of 0.02 to 0.4 mg/kg and 0.02 to 1 mg/kg respectively. Some of the Aldrin/ Dieldrin residues were above the Codex EMRL but not for DDT. Further samples of Pig were analyzed during the same period for Aldrin /Dieldrin in 608 samples and for DDT in 1390 samples. Only 0.32 % and 0.50% of samples makes the presence in the range of 0.02 to 0.1 mg/kg and 0.12 to 1.0 mg/kg of Aldrin/ Dieldrin and DDT respectively which are well within the prescribed Codex EMRLs. 8578 Beef samples analyzed for Aldrin /Dieldrin and DDT during the same period (1999-2009) and 0.5% and 0.73% were found to have presence of their residue in the range of 0.02- 0.04 mg/kg and 0.1 to 2.5 mg/kg respectively. Some of the Aldrin/ Dieldrin residue are above the Codex EMRL. However analysis of 3344 beef samples during same period revealed the presence of Heptachlor residue in 0.2% of samples in the range of 0.002 to 0.1 mg/kg which is less than Codex EMRL.

45. United Kingdom monitored 120 samples for Dieldrin and 240 samples in 2006 and 480 samples during 2007-08 for DDT residue. Residue of DDT was found in between 0.002 to 0.04 mg/kg and was within the relevant Codex EMRLs. During 2000-07 New Zealand monitored 3329 samples of meat fat for Aldrin / Dieldrin and for DDT (T). Residues of aldrin/dieldrin were found ranged from 0.005 to 0.12 mg/kg. Residues of DDT (T) in meat fat were found between 0.005 to 3.24 mg/kg.

46. US monitoring study of 1655 animals meat samples during 2004-08 for DDT (T), it was found that only 3.2 % samples have residue in the range of 0.0007 to 0.0038 mg/kg which are much less than the Codex EMRL of 5 (fat) mg/kg. Germany had a monitoring study of Animal meat during 2000-09 for Aldrin (9345 samples) Chlordane (25739 samples), DDT (T) (25669 samples), Dieldrin (23940 samples), Endrin (17692 samples), Heptachlor (21285 samples), Mirex (6963 sample) and Toxaphene (12569 sample). The number of samples above the LOR was not reported though the residues levels of samples above the LOR was.

47. The following range of residue levels above the LOR were found in monitoring by Germany

Sl. No.	Name of pesticide residue	Minimum (mg/kg)	Maximum (mg/kg)	Codex EMRL (mg/kg)
1.	Aldrin	1*	7*	0.2
2.	Chlordane	1*	9.93*	0.05
3.	DDT(T)	0.997	9.12*	5.00
4.	Dieldrin	0.011	9*	0.2
5.	Endrin	1*	9*	0.1
6.	Heptachlor	0.017	9.59*	0.2
7.	Mirex	1	5.5	Not prescribed
8.	Toxapene	1	8	Not prescribed

“*” Exceeding Codex EMRL

48. The result revealed that animal meat samples are having residue of all pesticide above EMRL and even in case of Toxaphene and Mirex, where Codex EMRL are not prescribed.

ANIMAL FAT

49. Monitoring of animal fat was only undertaken by India in two phases i.e. from Oct. 06-Oct. 07 and from Nov. 07 to Oct. 08. During 1st phase out of 25 samples monitored, residue of DDT (T), HCH and Heptachlor were detected in 40%, 68% and 26% cases respectively. These were in the range of 0.012 to 0.909, 0.011 to 0.125 and 0.004 to 0.098 mg/kg respectively. In 2nd phase the above residues were found in 86.67%, 46% and 10% samples monitored in the range of 0.01 to 1.68, 0.01 to 0.248 and 0.013 to 0.0235 mg/kg. The Codex EMRL prescribed for DDT (T) and Heptachlor in Animal Fat is 5 ppm and 0.2 mg/kg respectively. The residue found in India for both studies were much below the Codex EMRL.

MILK

50. Analysis of samples of milk was under taken in India, New Zealand, UAS and Germany for some POPs. India analyzed 501 samples during November, 2007- October, 2008 for HCH (T) and DDT (T) and revealed that only 3.59% and 1% samples are having residue in the range of 0.01 to 0.34 mg/kg and 0.01 to 0.027 mg/kg

respectively. Some of the samples have residue of DDT exceeding the Codex EMRL of 0.02 F mg/kg. On analysis of 1855 samples during 2002-07 in New Zealand for DDT (T) it was found that 17.68 %samples are found to have residue in the range of 0.002 to 0.022 mg/kg. Two samples exceeded the Codex EMRL of 0.02 F mg/kg although it was noted that the average milk fat content in these samples was 5% (compared to the 4% fat content used by Codex). . USA analyzed for DDT (T) and Dieldrin residue in 1485 samples of milk. It was revealed that 90% samples are having DDT residues in the range of 0.0001 to 0.0056 mg/kg. However none of them exceeded the Codex EMRL of 0.02 F mg/kg. Similarly 32.3 % samples are contaminated with Dieldrin in the range of 0.00013 to 0.00059 mg/kg. These are also within Codex EMRL of 0.0006 F mg/kg. German monitoring study of milk samples pertains to 2000-2009. Analyses of 2706 samples for Aldrin, 4979 samples for Chlordane, 5761 samples for DDT(T) and 5600 samples for Dieldrin revealed that samples are having residue in the range of 0.111 to 4 mg/kg; 3.87 to 9.767 mg/kg, 1.11 to 9.032 mg/kg and 1-6 mg/kg respectively. All have exceeded the Codex EMRL (Aldrin 0.006 F, chlordane - 0.002 F, DDT (T)-0.02 F and Dieldrin - 0.006 F mg/kg).

MILK PRODUCTS

51. India had monitoring study of 441 butter samples for HCH (T) and DDT (T) residue during November 2007- October 2008. This study revealed that 2.94 % and 5-9 % of samples were showed the presence of residue of HCH and DDT with >LOR residues in the range of 0.01 to 0.04 and 0.01 to 0.02 mg/kg respectively. New Zealand monitored 148 cattle milk products during 2004-07 and found DDT (T) residue in 2.02 % samples in the range of 0.002 to 0.044 mg/kg(fat basis). Germany monitored milk products during 2000-2009 for Aldrin (1321), Chlordane (3152), DDT(T) (3598), Dieldrin (3097), Endrin (2647), Heptachlor (2779), Mirex (174) and Toxaphene (724). Greater than LOR residues were in the range of 1 to 9.6 mg/kg. .

52. The EMRLs for milk all have the F annotation. In such cases the residue is designated fat soluble and MRLs for milk products are derived as explained in "Codex Maximum Residue Limits/Extraneous Maximum Residue Limits for Milk and Milk Products".Codex MRLs/EMRLs 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 with the letter "F" in conjunction with the MRL specified for milk. However, in case of an MRL or EMRL set at or about the limit of determination, the letter "F" is not used.

HEAVY CREAM

53. USA monitored samples of heavy cream for DDT (1111 samples) during 2005-07, for Dieldrin (369 samples) during 2005 and for Hexachlorobenzene (742 samples) during 2007. Out of these samples 68.6 % samples had residues of DDT (T) above the LOR with >LOR residues in the range of 0.001 to 0.038 mg/kg, 33% above the LOR for Dieldrin at a level of 0.0013 mg/kg and 42 % above the LOR for Hexachlorobenzene with >LOR residues in the range of 0.0002 to 0.005 mg/kg.

EGG

54. Analysis of Egg for residue of DDT-T was done in India in two phases, once from October, 2006 to October, 2007 and subsequently November, 2007 to October, 2008. In 1st phase 23.33% samples were found to be contaminated in the range of 0.010 to 0.047 mg/kg. In 2nd phase 21.6% samples are contaminated with DDT residue in the range of 0.01 to 0.089 mg/kg. However, in German study of 2000-2009, 4274 samples analyzed and those samples with residues above LOR were found to be contaminated in the range of 1.1 to 2.86 mg/kg. The Codex EMRL is 0.1 mg/kg. As can be seen, some residues in German samples are more than the Codex EMRL for DDT in Eggs.

55. Out of 215 samples analysed during 2nd phase by India 2.3% samples were contaminated with HCH and 1.4% sample contaminated with Heptachlor with above LOR residues in the range of 0.011 to 0.089 mg/kg and 0.012 to 0.047 mg/kg respectively. Germany made analysis for Chlordane, Dieldrin and Endrin in 26, 4274 and 4190 samples respectively. The result shows a single level of 2.9 mg/kg for Chlordane residue, whereas, for Dieldrin and Endrin residue above LOR were in the range of 1-8 mg/kg and 1-3 mg/kg respectively. Codex EMRLs have been established for Chlordane as 0.02 mg/kg and Dieldrin as 0.1 mg/kg. There is no Codex EMRL for Endrin in Eggs.

SPICES

56. No Codex EMRLs have been established for spices.

57. Indian monitoring study on spices relates to November, 2007 to October 2008 during which 61 samples were analyzed for HCH-T and DDT-T. HCH-T residue was found in 3.3 % of samples in the range of 0.11 to 0.16 mg/kg and DDT-T residue in 4.9% samples in the range of 0.54 to 0.72 mg/kg respectively. USA studied 392 samples for DDT (T) residue during 2004 and found only 0.5% sample have residue at the level or 0.0032 mg/kg. German monitoring study relates to the period 2000-2009 for residues of Aldrin (3557 samples), DDT-T (3726 samples), Dieldrin (5303 samples) Endrin (3286 samples) and Mirex (954 samples). Residues above LOR were present in the level of Aldrin -5 mg/kg, DDT (T) 0.487-3.6 mg/kg, Dieldrine-2.5 -5 mg/kg, Endrin 2-6.9 mg/kg and Mirex -7 mg/kg.

FISH

58. No Codex EMRLs have been established for any of the compounds in fish.

Residue in fish was analyzed in India during October, 2006-October, 2007 and in Germany during 2000-09. Out of 390 samples analyzed in India only 2 samples (0.51%) were found to have DDT (T) residue in the range of 0.01 to 0.027 mg/kg where as in Germany 4299 samples showed residue in range or 0.015 to 64.08 mg/kg.

59. Indian study revealed only 1 (0.25%) sample at the level or 0.06 mg/kg of Heptachlor. Germany analyzed 3819 samples and Heptachlor residue was found in the range of 1 to 9.59 mg/kg. Germany had analyzed fish samples for Aldrin, Chlordane, Dieldrin, Endrin, Mirex and Toxaphene during 2000-09 1590 samples were analyzed. Residues of Aldrin above the LOR were in the range of 1 to 8 mg/kg where as 3648 samples analyzed showed some Dieldrin residues above the LOR with residues in the range of 0.011 to 9 mg/kg. Chlordane was analyzed in 4221 samples and where residues were above the LOR they were in the range of 0.02 to 7.8 mg/kg. Residues of Endrin, Mirex and Toxaphene were analyzed in 3853, 145 and 3478 samples respectively and the residues that were above the LOR were 1 to 8.4, 1 to 6.1 and 1 to 6.5 mg/kg respectively.

FISH AND MARINE PRODUCTS

60. No Codex EMRL has been established for the compounds in fish and marine products.

61. Monitoring was done by India for Aldrin, DDT, HCH and Heptachlor and by Germany for Chlordane, DDT and Dieldrin residue. On analysis of 714 fish and marine products by India during Nov, 07 to Oct. 08 revealed that 0.14%, 2.1%, 1.4 % and 0.14% of samples showed the presence of Aldrin, DDT (T) HCT-T and Heptachlor residue respectively. Aldrin was found in only one sample at the level of 0.011 mg/kg, DDT (T) where above the LOR was in the range of 0.01 to 0.0301 mg/kg, HCH-T above the LOR were in the range of 0.01 to 0.28 mg/kg and Heptachlor at 0.02 mg/kg respectively. German monitoring Study for Marine product relates to the period 2000- 2009 when 374 samples, 568 samples and 308 samples were analyzed for Chlordane, DDT (T) and Dieldrin residue respectively. Residues above LOR were found in the range of 0.011 to 9.087 mg/kg for Chlordane, 0.273 to 6.0 mg/kg for DDT-T and 1-5.9 mg/kg for Dieldrin. No Codex EMRL has been established.

BABY FOOD

62. Baby food is a processed commodity and no Codex EMRLs has been established for this food.
63. Baby food samples were analyzed by Germany during 2000-09 for residue of Aldrin (1142 samples), Chlordane (309 samples), DDT (T) (1586 samples), Dieldrin (1920 samples), Endrin (309 samples) and Heptachlor (250 samples) and those above the LOR found to be present in the range of 5 mg/kg, 1.2 to 9.7 mg/kg, 1.1 to 8.5 mg/kg, 1 to 5 mg/kg, 2 mg/kg and 9.6 mg/kg respectively. During 2005-07, 28 samples of processed baby food was monitored by Spain for Aldrin / Dieldrin and Endrin residues which revealed that only one sample each were having the presence for both pesticides in the range of 0.001 to 0.003 mg/kg. Analysis of 177 samples for Heptachlor residue, only one sample has been found to be present in the range of 0.01 to 0.02 mg/kg.

SUMMARY

64. Percentage of samples with detection is related to the level of LOR. Low LOR with sensitive techniques might have led to more detection percentages.
65. Some countries have analysed residues of Aldrin and Dieldrin separately whereas some countries like Australia, New Zealand and Poland kept them together in agreement with the Codex definition of residue. The pesticide residue (Aldrin/Dieldrin) was monitored by different countries between 1999 and 2009 and in a number of commodities. In most of the commodities as reported have not exceeded the limit of reporting (LOR). India found Aldrin residue in one fish sample out of 714 samples at 0.11 mg/kg almost equal to the LOR. In fruit (pears) residue was at 0.143 mg/kg in one out of 2500 samples. There is no Codex EMRL for fish or pears. Residues were also reported in cauliflower (India 0.01-0.28 mg/kg) and Fruiting?? (India 0.01-0.838 mg/kg).
66. Australia provided one decade POP data on aldrin/dieldrin for the period of 1999-2009 for cattle, sheep, pig and beef food commodities on fat basis. Out of 18527 samples only five samples are above EMRL(3-bet EMRL-Twice EMRL ;2-above twice EMRL.
67. United Kingdom reported POP residue data for the period 2006-08 in lamb (dieldrin), DDT in animal meat, dieldrin in courgettes and marrows. The data, although not mentioning tissue basis, was well below available Codex EMRL.
68. New Zealand monitoring data during 2000-2007 showed that residues of aldrin/dieldrin in meat (fat) and in raw milk were below the Codex EMRL. Residues of DDT (T) in meat (fat) and milk products (fat) were also below the Codex EMRLs but in raw milk they were higher than the Codex EMRL (however, if adjusted back to a 4% fat content, residues did not exceed the Codex EMRL)..
69. In the POP residue data, for the period 2004-08, provided by United States of America, the significant observations was that no commodity showed maximum residues of POPs above Codex EMRL wherever existing..
70. The German POP monitoring data pertaining to the period 2000-2009 have large sample size for almost all major commodities. The highlight of these data set is that the maximum POP residues crossed Codex EMRL in vegetables, fruits, animal meat, milk, food grains, eggs etc. Significant point to be noted is the fact that in many commodities a Codex EMRL has not been established.
71. In Poland, the monitoring data in large number of vegetables and cereal grains samples showed during 2004-08 that maximum POPs residues were below relevant Codex EMRLs.
72. Spanish monitoring data for the period, 2005-07 showed, in large number of samples, that there were no POP residues above Codex EMRLs in vegetables.

73. India provided POP monitoring data for the period 2006-2008 in large number of samples of ten common commodities with occasional exceedance of Codex EMRLs found.

CONCLUSION AND RECOMMENDATIONS

74. The EWG thanks those countries for providing monitoring data. In general the data presented did not allow any conclusions to be drawn as to which results may have been reflective of continuing use, which is the concern of the Stockholm Convention, versus residues transferred to commodities solely associated with historical environmental levels. The monitoring data, while indicating the consumption of food is unlikely to cause human health risks from these compounds, does indicate that significant residues can still be expected in some commodities as a result of historical use.

75. The EWG recognizes that the banning of these compounds, rather than the use of Codex EMRLs, has been the main and an effective risk management tool and while supporting the Stockholm Convention initiatives, confirms that Codex EMRLs are still required to accommodate residues that are still occurring in some food commodities in trade. It is noted that JMPR has not identified any new public health concerns that would justify any lowering of the current Codex EMRLs and it is further noted that some countries who are in full compliance with the Stockholm Convention on Persistent Organic Pollutants have highlighted that any changes to existing EMRLs are likely to result in significant trade concerns.

76. Monitoring data provided indicates there are some traded RAC that may require establishment of EMRLs to facilitate their trade, however it is unclear from the data provided, as to whether these residues are a result of historical use (and thus 'eligible' for EMRL consideration).

77. With the recent inclusion of lindane into the listing of POPs, the current MRLs for lindane may no longer be appropriate, particularly as registrations for this compound should have been withdrawn.

78. Therefore, the following recommendations are made:

1. Existing EMRLs

79. As there are no dietary intake concerns and to ensure facilitation of trade, no revision of the existing EMRLs is deemed necessary at this stage.

2. New EMRLs

80. Should countries wish to establish new EMRLs for traded RACs such as some fruits and vegetables, then they should follow the procedure for inclusion into the Priorities List to initiate new proposals and forward appropriate data sets to JMPR for consideration when necessary.

3. Lindane MRLs

81. As lindane is now being listed as a POP under the Stockholm Convention, lindane should be included on the Priority List for consideration of EMRLs (based on monitoring data to be submitted to JMPR) with the subsequent revocation of the existing MRLs.

ANNEXURE

1. ALDRIN

The countries have analysed various samples between 1999 to 2009 on various commodities. In none of the samples the residue found were more than LOR (Limit of Reporting) except the following.

Country	Compound	Commodity	Sampling period	Codex MRL	LOR (mg/kg)	Samples analysed	Samples > LOR	Range of positive samples (mg/kg)	No. of samples between LOR-1/5th ERL	No. of samples between LOR-1/5th ERL- 1/2 ERL	No. of samples between 1/2 ERL- ERL	No. of samples between ERL - Twice ERL	No. of samples twice MRL
Germany	Aldrin	Animal meat	2000-2009	0.2 (F)	NA	9345	NA	1-7.0	NA	NA	NA	NA	NA
Germany	Aldrin	Cereal grains	2000-2009	0.02	NA	550	NA	1.0-5.0	NA	NA	NA	NA	NA
India	Aldrin	Fish	Nov 07- Oct 08	-	0.01	714	1	0.011	-	-	-	-	-
Germany	Aldrin	Fishes	2000-2009	-	NA	1590	NA	1-8.0	NA	NA	NA	NA	NA
Germany	Aldrin	Fruits	2000-2009	0.05 citrus, pome	NA	12547	NA	5	NA	NA	NA	NA	NA
India	Aldrin	Fruits (Pome)	Nov, 08-Dec, 09	0.05	0.01	2500	1	0.143	0	0	0	0	1
Germany	Aldrin	Milk	2000-2009	0.006 (F)	NA	2706	NA	0.111-4.0	NA	NA	NA	NA	NA
Germany	Aldrin	Milk products	2000-2009	see milk	NA	1321	NA	1	NA	NA	NA	NA	NA
Germany	Aldrin	Processed food (Baby food)	2000-2009	-	NA	1142	NA	5	NA	NA	NA	NA	NA
Germany	Aldrin	Processed food (Fruit juice)	2000-2009	-	NA	884	NA	5	NA	NA	NA	NA	NA
Germany	Aldrin	Spices	2000-2009	-	NA	3557	NA	5	NA	NA	NA	NA	NA
Germany	Aldrin	Vegetables	2000-2009	0.05 - 0.1 various	NA	6387	NA	2.0-5.0	NA	NA	NA	NA	NA
India	Aldrin	Vegetables	Nov, 07-Dec, 09	0.05 - 0.1 various	0.01	8613	5 (Cauliflower)	0.01-0.28	-	-	-	-	-
India	Aldrin	Vegetables/ Fruiting other (okra)	Nov, 07-Dec, 09	-	0.01	8613	3	0.01 - 0.838	1	0	0	0	2
Australia	Aldrin/ Dieldrin.	Animal Fat (mammals other than marine mammals)	1999-2009	0.2 (F)	0.02	18527	56	0.02-1.3	29	18	4	3	2
New Zealand	Aldrin/ Dieldrin.	Animal Fat (mammals other than marine)	2000-2007	0.2	0.01 - 0.005	3041	104	0.005-0.12	84	17	2	0	0

mammals)

Spain	Aldrin/ Dieldrin.	Processed food	2007	-	0.001	6	1	0.003
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- 1.1 In India one sample out of 714 fish samples was at the level of 0.011 mg/ kg which is slightly more than LOR of 0.01 mg.
- 1.2 In pome fruits from India only one sample out of 2500 samples was above the LOR of 0.01 mg/kg and was 0.143 mg/ kg.
- 1.3 Indian data showed that the residue was found in 5(cauliflower)(ranged from 0.01 to 0.28 mg/kg)and 3 (okra)(ranging from 0.01 to 0.838 mg/ kg;)out of 8613 samples of all vegetables analysed. . There is no Codex EMRL for cauliflower , okra or fruiting vegetables other than cucurbits,
- 1.4 One sample out of 6 samples in Spain's data for processed food revealed the slight higher residue (0.003mg/kg) than the LOR of 0.001 mg.
- 1.5 56 of 18527 samples of cattle meat (fat) in Australia showed presence of Aldrin/Dieldrin in the range of 0.02 to 1.3 mg/kg against the LOR of 0.02 mg/kg. 22 samples above LOR were between LOR and 1/5th of EMRL. 14 samples were between 1/5th of EMRL and half of EMRL. 3 samples each are between half EMRL and EMRL and EMRL and twice EMRL respectively. Codex EMRL is 0.2 mg/kg.
- 1.7 New Zealand data showed presence of Aldrin/ Dieldrin in 104 out of 3041 meat (fat) samples in range of 0.005 to 0.12 mg/kg. 84 samples are between LOR and 1/5th of EMRL, 17 samples between 1/5th of EMRL and half of EMRL and 2 samples were between half of EMRL and EMRL of 0.2 mg/ kg.
- 1.8 New Zealand data showed residue of Aldrin/Dieldrin in Horse meat (fat). In 14 out of 438 samples levels are between 0.007 to 0.04 mg/kg. 13 samples are above LOR and between LOR and 1/5th of EMRL..

2. α and β HCH

There are no Codex EMRL established for this alpha and beta hexachlorohexane .Monitoring data mostly conducted in India for various products have shown residues > LOR occur in the range of 0.02-3.1% of samples in various range. The following table showed the commodity where the residue is above LOR.

Country	Compound	Commodity	Sampling period	Codex MRL	LOR (mg/kg)	Samples analysed	Samples > LOR	Range of positive samples (mg/kg)	No. of samples between LOR-1/5th ERL	No. of samples between LOR-1/5th ERL- 1/2 ERL	No. of samples between 1/2 ERL- ERL	No. of samples between ERL - Twice ERL	No. of samples twice MRL
India	Alpha & Beta - HCH	Animal Fat (mammals other than marine mammals)	Oct 06- Oct 08	-	0.01	1295	41	0.011-0.248	-	-	-	-	-
India	Alpha & Beta - HCH	Poultry (Fat)	Oct 06- Oct 07	-	0.01	35	7	0.01-0.125	-	-	-	-	-
India	Alpha & Beta - HCH	Poultry (Meat)	Nov 07- Oct 08	-	0.01	200	4	0.116-0.191	-	-	-	-	-
India	Alpha & beta - HCH	Egg	Nov 07- Oct 08	-	0.01	215	4	0.01-0.09	-	-	-	-	-
India	Alpha -HCH	Cereal grains	Nov, 07-Dec, 09	-	0.01	2185	8	0.01-0.08	-	-	-	-	-
India	Alpha -HCH	Fish	Nov, 07-Dec, 09	-	0.01	1270	5	0.01-0.28	-	-	-	-	-
India	Alpha -HCH	Fruits	Nov 07- Oct 08	-	0.01	1726	2	0.01-0.04	-	-	-	-	-
India	Alpha -HCH	Milk	Nov 07- Oct 08	-	0.01	501	6	0.01-0.044	-	-	-	-	-
India	Alpha -HCH	Milk product (Butter)	Nov 07- Oct 08	-	0.01	441	6	0.01-0.04	-	-	-	-	-
India	Alpha -HCH	Pulses	Nov, 08-Dec, 09	-	0.01	542	1	0.01	-	-	-	-	-
India	Alpha -HCH	Vegetables	Oct 06-Dec, 09	-	0.01	10902	38	0.01-0.658	-	-	-	-	-
India	Alpha -HCH	Water	Oct 06- Oct 07	-	0.5ppb	955	1	3.7 ppb	-	-	-	6	4
India	Alpha-HCH	Fruits	Nov, 08-Dec, 09	-	0.01	2500	2	0.01	-	-	-	-	-
India	Alpha-HCH	Milk	Nov, 08-Dec, 09	-	0.01	708	3	0.01-0.245	-	-	-	-	-
India	Beta-HCH	Cereals grain	Nov, 08-Dec, 09	-	0.01	4965	1	0.2	-	-	-	-	-
India	Beta-HCH	Fish	Nov, 07-Dec, 09	-	0.01	1270	4	0.02-0.04	-	-	-	-	-
India	Beta-HCH	Fruits	Nov, 07-Dec, 09	-	0.01	4226	2	0.01-0.069	-	-	-	-	-
India	Beta-HCH	Milk	Nov, 07-Dec, 09	-	0.01	1209	8	0.01-0.041	-	-	-	-	-
India	Beta-HCH	Milk product (Butter)	Nov 07- Oct 08	-	0.01	441	2	0.02-0.04	-	-	-	-	-
India	Beta-HCH	Vegetables	Oct 06-Dec, 09	-	0.01	10902	58	0.01-2.32	-	-	-	-	-
India	Beta-HCH	Water	Oct 06- Oct 07	-	0.5	955	13	0.54-1.5 ppb	-	-	-	-	-

Residues are occasionally found in vegetables, animal products (mammalian meat, fat; milk; poultry meat; eggs; fish).

3. CHLORDANE

The monitoring data of U.K, Poland, New Zealand, Australia and Spain did not show any residue above LOR. However, some data of U.S.A. and Germany showed the presence. The following table showed the commodity where the residue is above LOR.

Country	Compound	Commodity	Sampling period	Codex MRL	LOR (mg/kg)	Samples analysed	Samples > LOR	Range of positive samples (mg/kg)	No. of samples between LOR-1/5th ERL	No. of samples between LOR-1/5th ERL- 1/2 ERL	No. of samples between 1/2 ERL- ERL	No. of samples between ERL - Twice ERL	No. of samples twice MRL
Germany	Chlordane	Animal meat	2000-2009	0.05 (F)	NA	25739	NA	1-9.93	NA	NA	NA	NA	NA
Germany	Chlordane	Eggs	2000-2009	0.02	NA	26	NA	2.9	NA	NA	NA	NA	NA
Germany	Chlordane	Fishes	2000-2009	-	NA	4221	NA	0.02-7.8	NA	NA	NA	NA	NA
Germany	Chlordane	Fruits	2000-2009	0.02	NA	1787	NA	1.0-8.0	NA	NA	NA	NA	NA
Germany	Chlordane	Marine products	2000-2009	-	NA	374	NA	0.011-9.87	NA	NA	NA	NA	NA
Germany	Chlordane	Milk	2000-2009	0.002 (F)	NA	4979	NA	3.87-9.76	NA	NA	NA	NA	NA
Germany	Chlordane	Milk products	2000-2009	See milk	NA	3152	NA	1.26-7.929	NA	NA	NA	NA	NA
Germany	Chlordane	Oil	2000-2009	-	NA	350	NA	0.012-4	NA	NA	NA	NA	NA
Germany	Chlordane	Processed food (Baby food)	2000-2009	-	NA	309	NA	9.7-1.2	NA	NA	NA	NA	NA
Germany	Chlordane	Tea	2000-2009	-	NA	1070	NA	0.02-2.3	NA	NA	NA	NA	NA
Germany	Chlordane	Vegetables	2000-2009	0.02 (cucurbits)	NA	412	NA	4-9.7	NA	NA	NA	NA	NA
U.S.	Chlordane cis	Processed food (Squash)	2006-08	NA	NA	5445	143	0.003 - 0.029	NA	NA	NA	NA	NA
U.S.	Chlordane cis	Vegetables	2004-08	0.02 (cucurbits)	NA	4562	20	0.001 - 0.008	NA	NA	NA	NA	NA

1. In vegetables of U.S.A. only 0.4% samples showed that the chlordane residue was present in the range of 0.001 to 0.008 mg/kg.
2. In Squash 2.6% samples contained the residue ranging from 0.003 to 0.02 mg/kg.
3. German monitoring of Vegetable, Fruits, Animal meat, Milk, Baby Food, Milk Product, Fish, Egg, Marine products, Oil and Tea some residues above LOR, some of which were higher than Codex EMRL wherever established.

4. DDT-T

The following table showed the commodity where the residue is above LOR.

Country	Compound	Commodity	Sampling period	Codex MRL	LOR (mg/kg)	Samples analysed	Samples > LOR	Range of positive samples (mg/kg)	No. of samples between LOR-1/5th ERL	No. of samples between LOR-1/5th ERL- 1/2 ERL	No. of samples between 1/2 ERL- ERL	No. of samples between ERL - Twice ERL	No. of samples twice MRL
UK	DDT-T	Fruit teas	2009	No MRL	0.01	90	2	0.01	N/A	N/A	N/A	0	0
Australia	DDT-T	Animal Fat (mammals other than marine mammals)	1999-2009	5 fat	0.1	18527	118	0.1-2.5	117	1	0	0	0
India	DDT-T	Animal Fat (mammals other than marine mammals)	Oct 06- Oct 08	5 fat	0.01	325	45	0.014-1.68	40	0	0	0	0
New Zealand	DDT-T	Animal Fat (mammals other than marine mammals)	2000-2007	5 fat	0.01 – 0.005	3329	1582	0.005-3.24	1574	7	1	0	0
Germany	DDT-T	Animal meat	2000-2009	5 fat	NA	25669	NA	0.997-9.12	NA	NA	NA	NA	NA
U.S.	DDT-T	Animal meat	2004-08	5 fat	NA	1655	54	0.0007 - 0.004	NA	NA	NA	0	0
India	DDT-T	Animal Meat (mammals other than marine mammals)	Nov 07- Oct 08	5 fat	0.01	1000	24	0.01-0.151	24	0	0	0	0
UK	DDT-T	Animal Meat (mammals other than marine mammals)	2006	5 fat	0.002	120	1	0.005	N/A	N/A	N/A	0	0
UK	DDT-T	Animal Meat/ Lamb (mammals other than marine mammals)	2006	5 fat	0.002	120	20	0.002 - 0.04	17	3	0	0	0
UK	DDT-T	Animal Meat/ Lamb (mammals other than marine mammals)	2009	5 fat	0.002	84	10	0.002 – 0.02	10	0	0	0	0
UK	DDT-T	Animal Meat/ Pig (mammals other than marine mammals)	2007	5 fat	0.002	119	1	0.002	1	0	0	-	-
UK	DDT-T	Bird (Duck)	2008	0.3 fat	0.002	72	1	0.007	1	0	0	0	0
India	DDT-T	Cereal grains	Nov, 07-Dec, 09	0.1	0.01	3816	7	0.012 - 0.246	3	2	1	0	1
U.S.	DDT-T	Cereal grains	2004-08	0.1	NA	3799	21	0.002 - 0.005	NA	NA	NA	0	0
Germany	DDT-T	Dried fruits	2000-2009	-	NA	306	NA	1.1-1.2	NA	NA	NA	NA	NA

India	DDT-T	Egg	Oct 06- Oct 08	0.1	0.01	275	51	0.01-0.09	23	23	5	-	0
Germany	DDT-T	Eggs	2000-2009	0.1	NA	4274	NA	1.1-2.86	NA	NA	NA	NA	NA
India	DDT-T	Fish	Oct 06-Dec, 09	-	0.01	1659	20	0.01 - 0.62	-	-	-	NA	-
UK	DDT-T	Fish (Oily Fish)	2006-2008	-	0.002	348	157	0.002 – 0.02	N/A	N/A	N/A	-	N/A
Germany	DDT-T	Fishes	2000-2009	-	NA	4299	NA	0.015-64.08	NA	NA	NA	NA	NA
Germany	DDT-T	Food grains	2000-2009	0.1 cereal grain	NA	2326	NA		NA	NA	NA	NA	NA
Germany	DDT-T	Fruits	2000-2009	-	NA	16106	NA	2.2-5.0 1-6.35	NA	NA	NA	NA	NA
India	DDT-T	Fruits	Nov, 07-Dec, 09	-	0.01	4226	19	0.01 - 0.59				NA	NA
U.S.	DDT-T	Fruits	2004-08	NA	NA	354	2	0.007	NA	NA	NA	0	NA
Spain	DDT-T	Fruits (Grapes)	2007	-	0.001	1	1	0.002	-	-	-	1	0
UK	DDT-T	Fruits (Strawberries)	2007	-	0.02	101	1	0.02	0	1	0	1	0
UK	DDT-T	Herbs	2007	-	0.02	72	1	0.02	0	1	0	NA	3
UK	DDT-T	Liver	2008	-	0.002	72	7	0.003 – 0.02	7	0	0	N/A	0
Germany	DDT-T	Marine products	2000-2009	-	NA	568	NA	0.273-6.2	NA	NA	NA	NA	NA
Germany	DDT-T	Milk	2000-2009	0.02 F	NA	5761	NA	1.11-9.032	NA	NA	NA	NA	NA
India	DDT-T	Milk	Nov, 07-Dec, 09	0.02 F	0.01	1209	15	0.01 - 0.52	0	0	10	1	NA
New Zealand	DDT-T	Milk	2002-2007	0.02 F	0.002 (Note 3)	1855	328 (Note 4)	0.002-0.022	205	101	20	0	0
U.S.	DDT-T	Milk	2004-08	0.02 F	NA	1485	1347	0.0001 - 0.006	NA	NA	NA	1	0
India	DDT-T	Milk product (Butter)	Nov 07- Oct 08	0.02 F	0.01	441	26	0.01-0.092	-	-	-	2	0
UK	DDT-T	Milk product (Butter)	2009	0.02 F	0.01	109	9	0.01 – 0.03	0	8	1	0	0
U.S.	DDT-T	Milk product (Heavy Cream)	2005-07	0.02 F	NA	1111	763	0.001 - 0.038	NA	NA	NA	0	0
Germany	DDT-T	Milk products	2000-2009	0.02 F	NA	3598	NA	1.1-9.478	NA	NA	NA	NA	NA
New Zealand	DDT-T	Milk products (fat)	2004-2007	0.5 (Note 2)	0.002 (Note 3)	148	32	0.002-0.044	32	0	0	0	0
Germany	DDT-T	Oil	2000-2009	-	NA	823	NA	1.12-7.81	NA	NA	NA	NA	NA
India	DDT-T	Poultry (Fat)	Oct 06- Oct 08	0.3 fat	0.01	65	11	0.01-0.411	8	1	1	0	0
India	DDT-T	Poultry (Meat)	Nov 07- Oct 08	0.3 fat	0.01	200	1	0.062	0	1	0	0	0
U.S.	DDT-T	Processed food	2004-08	-	NA	943	11	0.007 - 0.034	NA	NA	NA	N/A	N/A
Germany	DDT-T	Processed food (Fruit juice)	2000-2009	-	NA	112	NA	0.266	NA	NA	NA	NA	NA
Germany	DDT-T	Processed food (Baby food)	2000-2009	-	NA	1586	NA	1.1-8.471	NA	NA	NA	NA	NA
U.S.	DDT-T	Processed food (Summer Squash)	2007	-	NA	1022	14	0.007	NA	NA	NA	0	N/A

India	DDT-T	Pulses	Nov, 08-Dec, 09	-	0.01	542	3	0.011 - 0.03	-	-	-	N/A	-
UK	DDT-T	Sausages	2008	-	0.002	108	1	0.003	N/A	N/A	N/A	-	NA
Germany	DDT-T	Spices	2000-2009	-	NA	3726	NA	0.487-3.6	NA	NA	NA	NA	NA
India	DDT-T	Spices	Nov 07- Oct 08	-	0.1	427	3	0.54-0.72	-	-	-	NA	-
U.S.	DDT-T	Spices	2004	-	NA	392	2	0.003	NA	NA	NA	-	0
Spain	DDT-T	Spices (Peppers)	2007	-	0.003	2	1	0.005	-	-	-	0	0
Germany	DDT-T	Tea	2000-2009	-	NA	2026	NA	0.98-2.22	NA	NA	NA	NA	NA
Germany	DDT-T	Vegetables	2000-2009	-	NA	17100	NA	0.02-8.92	NA	NA	NA	NA	NA
India	DDT-T	Vegetables	Oct 06- Dec, 09	-	0.01	10902	97	0.01-3.40	-	-	-	NA	NA
U.S.	DDT-T	Vegetables	2004-08	-	NA	19388	1636	0.002 - 0.045	NA	NA	NA	-	-
Spain	DDT-T	Vegetables/ leafy	2007	-	0.003	4	2	0.007-0.03	-	-	-	-	-
UK	DDT-T	Vegetables/ leafy	2008	-	0.01	108	3	0.02	0	3	0	-	-
Spain	DDT-T	Vegetables/ legume	2007	-	0.003	1	1	0.012	-	-	-	-	-
UK	DDT-T	Vegetables/ root (Parsnips)	2008	-	0.01	97	6	0.02 - 0.05	0	1	6	-	-
UK	DDT-T	Vegetables/ root (Potatoes)	2007	-	0.02	144	1	0.02	0	0	0	-	-
Germany	DDT-T	Water	2000-2009	-	NA	48	NA	3	NA	NA	NA	NA	NA
India	DDT-T	Water	Oct 06- Oct 08	-	0.0005	3706	4	0.0006-0.0025	-	-	-	-	-

1. Indian monitoring data on Egg were all <EMRL of 0.1 mg/kg. The data from Germany showed some residues above LOR and the EMRL with >LOR residues in the range 1.1-2.86 mg/kg.
2. Most of the residue data for Animal meat were < ½ of the EMRL except for a single result from New Zealand and some samples from German monitoring.
3. As regards Poultry meat, the residues did not exceed the Codex EMRL of 0.3.
4. Indian data for cereal grain shows one sample out of 3816 samples double of EMRL.

5. DIELDRIN

The following table showed the commodity where the residue is above LOR.

Country	Compound	Commodity	Sampling period	Codex MRL	LOR (mg/kg)	Samples analysed	Samples > LOR	Range of positive samples (mg/kg)	No. of samples between LOR-1/5th ERL	No. of samples between LOR-1/5th ERL- 1/2 ERL	No. of samples between 1/2 ERL- ERL	No. of samples between ERL - Twice ERL	No. of samples twice MRL
Germany	Dieldrin	Animal meat	2000-2009	0.2 fat	NA	23940	NA	0.011-9	NA	NA	NA	NA	NA
UK	Dieldrin	Animal Meat (mammals other than marine mammals)	2006	0.2 fat	0.002	120	1	0.002	1	0	0	0	0
Germany	Dieldrin	Cereal grains	2000-2009	0.02	NA	867	NA	1.0-5.0	NA	NA	NA	NA	NA
U.S.	Dieldrin	Cereal grains	2004	0.02	NA	616	4	0.004	NA	NA	NA	NA	NA
Germany	Dieldrin	Dried fruits	2000-2009	-	NA	41	NA	7	NA	NA	NA	NA	NA
Germany	Dieldrin	Eggs	2000-2009	0.1	NA	4190	NA	1.0-8.0	NA	NA	NA	NA	NA
UK	Dieldrin	Fish	2007-2008	-	0.002	229	46	0.002 – 0.006	N/A	N/A	N/A	NA	NA
Germany	Dieldrin	Fishes	2000-2009	-	NA	3648	NA	0.011-9	NA	NA	NA	NA	NA
Germany	Dieldrin	Fruits	2000-2009	0.05 citrus, pome	NA	22248	NA	1-5.0	NA	NA	NA	NA	NA
U.S.	Dieldrin	Fruits	2005	0.05 citrus, pome	NA	114	1	0.005	NA	NA	NA	NA	NA
Spain	Dieldrin	Fruits & Vegetables	2006	0.05-0.1	0.01	3668	1	0.03+/- 0.01				0	0
Germany	Dieldrin	Marine products	2000-2009	-	NA	308	NA	1-5.9	NA	NA	NA	NA	NA
Germany	Dieldrin	Milk	2000-2009	0.006 F	NA	5600	NA	1.0-6.0	NA	NA	NA	NA	NA
U.S.	Dieldrin	Milk	2004-05	0.006 F	NA	1485	480	0.00013 - 0.001	NA	NA	NA	NA	NA
U.S.	Dieldrin	Milk product (Heavy Cream)	2005	0.006 F	NA	369	122	0.001	NA	NA	NA	N/A	N/A
Germany	Dieldrin	Milk products	2000-2009	0.006 F	NA	3097	NA	1.0-8.0	NA	NA	NA	NA	NA
Germany	Dieldrin	Oil	2000-2009	-	NA	705	NA	1-6.4	NA	NA	NA	NA	NA
U.S.	Dieldrin	Processed food	2006-08	NA	NA	1718	209	0.005 - 0.18	NA	NA	NA	NA	NA
Germany	Dieldrin	Processed food (Baby food)	2000-2009	-	NA	1920	NA	1.0-5.0	NA	NA	NA	NA	NA
Germany	Dieldrin	Processed food (Fruit juice)	2000-2009	-	NA	2331	NA	5.0-6.0	NA	NA	NA	NA	NA
U.S.	Dieldrin	Processed food (Winter Squash)	2004-06	NA	NA	1133	87	0.01 - 0.2	NA	NA	NA	N/A	N/A
Germany	Dieldrin	Spices	2000-2009	-	NA	5303	NA	2.5-5.0	NA	NA	NA	NA	NA
Germany	Dieldrin	Tea	2000-2009	-	NA	1461	NA	7.0-8.0	NA	NA	NA	NA	NA
Germany	Dieldrin	Vegetables	2000-2009	0.05-0.1	NA	23619	NA	1-8.1	NA	NA	NA	NA	NA

U.S.	Dieldrin	Vegetables	2004-08	0.05-0.1	NA	5175	62	0.005 - 0.03	NA	NA	NA	NA	NA
UK	Dieldrin	Vegetables/ cucurbits	2008	0.1	0.01	96	2	0.03	0	0	1	NA	NA
Germany	Dieldrin	Water	2000-2009	-	NA	52	NA	0.35-1	NA	NA	NA	NA	NA

6. ENDRIN

The following table showed the commodity where the residue is above LOR.

Country	Compound	Commodity	Sampling period	Codex MRL	LOR (mg/kg)	Samples analysed	Samples > LOR	Range of positive samples (mg/kg)	No. of samples between LOR-1/5th ERL	No. of samples between LOR-1/5th ERL- 1/2 ERL	No. of samples between 1/2 ERL- ERL	No. of samples between ERL - Twice ERL	No. of samples twice MRL
Germany	Endrin	Animal meat	2000-2009	-	NA	17692	NA	1.0-9.0	NA	NA	NA	NA	NA
Germany	Endrin	Eggs	2000-2009	-	NA	4164	NA	1.0-3.0	NA	NA	NA	NA	NA
UK	Endrin	Fish (Trout & Salmon)	2007	-	0.002	120	1	0.002	N/A	N/A	N/A	N/A	
Germany	Endrin	Fishes	2000-2009	-	NA	3853	NA	1-8.4	NA	NA	NA	NA	NA
Germany	Endrin	Fruits	2000-2009	-	NA	9739	NA	2.0-7.0	NA	NA	NA	NA	NA
Germany	Endrin	Milk	2000-2009	-	NA	7784	NA	1.0-5.0	NA	NA	NA	NA	NA
Germany	Endrin	Milk products	2000-2009	-	NA	2647	NA	1.0-6.0	NA	NA	NA	NA	NA
Germany	Endrin	Oil	2000-2009	-	NA	224	NA	5	NA	NA	NA	NA	NA
Spain	Endrin	Processed food	2007	-	0.001	6	1	0.003					NA
Germany	Endrin	Processed food (Baby food)	2000-2009	-	NA	309	NA	2	NA	NA	NA	NA	NA
U.S.	Endrin	Processed food (Summer Squash)	2006-08	0.05 cucurbits	NA	1348	26	0.007 - 0.044	NA	NA	NA	NA	N/A
Germany	Endrin	Spices	2000-2009	-	NA	3286	NA	2.0-6.9	NA	NA	NA	NA	NA
Germany	Endrin	Tea	2000-2009	-	NA	1603	NA	2.0-4.0	NA	NA	NA	NA	NA
Germany	Endrin	Vegetables	2000-2009	0.05 cucurbits	NA	6172	NA	1.5-7.0	NA	NA	NA	NA	NA
U.S.	Endrin	Vegetables	2004-08	0.05 cucurbits	NA	929	9	0.007 - 0.013	NA	NA	NA	NA	NA

Endrine has Codex EMRL only for fruiting vegetables, cucurbit (0.05 mg/kg) and Poultry meat (0.1(fat) mg/kg). The monitoring data of Poultry meat received from U.K. did not show any residue above LOR.

As regards vegetables, USA data shows between 0.007- 0.01 mg/kg, German data shown in the range or 1.5-7.0 mg/kg

The monitoring data on Animal meat, egg, fish, fruits, Milk & milk products from Germany showed occasional residue at higher levels.

7. HEPTACHLOR

The following table showed the commodity where the residue is above LOR.

Country	Compound	Commodity	Sampling period	Codex MRL	LOR (mg/kg)	Samples analysed	Samples > LOR	Range of positive samples (mg/kg)	No. of samples between LOR-1/5th ERL	No. of samples between LOR-1/5th ERL- 1/2 ERL	No. of samples between 1/2 ERL- ERL	No. of samples between ERL - Twice ERL	No. of samples twice MRL
Australia	Heptachlor	Animal Fat (mammals other than marine mammals)	1999-2009	0.2 fat	0.02	8578	7	0.02-0.1	4	3	0	0	0
Germany	Heptachlor	Animal meat	2000-2009	0.2 fat	NA	21285	NA	0.017-9.59	NA	NA	NA	NA	NA
India	Heptachlor	Animal Meat (mammals other than marine mammals)	Nov 07- Oct 08	0.2 fat	0.01	200	2	0.013-0.025	2	0	0	0	0
U.S.	Heptachlor	Cereal grains	2008	0.02	NA	1300	2	0.008	NA	NA	NA	-	
India	Heptachlor	Egg	Nov 07- Oct 08	0.05	0.01	215	3	0.01-0.05	0	2	1	0	0
India	Heptachlor	Fish	Oct 06- Oct 08	-	0.01	1103	4	0.02- 0.098	-	-	-	-	-
Germany	Heptachlor	Fishes	2000-2009	-	NA	3819	NA	1-9.59	NA	NA	NA	NA	NA
Germany	Heptachlor	Fruits	2000-2009	-	NA	769	NA	2-6.43	NA	NA	NA	NA	NA
U.S.	Heptachlor	Fruits	2008	0.01 citrus, pineapple	NA	668	1	0.007	NA	NA	NA	NA	NA
Germany	Heptachlor	Milk	2000-2009	0.006 F	NA	4688	NA	2.88-9.6	NA	NA	NA	NA	NA
Germany	Heptachlor	Milk products	2000-2009	See milk	NA	2779	NA	1.9-9.6	NA	NA	NA	NA	NA
India	Heptachlor	Poultry (Meat)	Nov 07- Oct 08	0.2 fat	0.01	200	1	0.014	1	0	0	NA	NA
Germany	Heptachlor	Processed food (Baby food)	2000-2009	-	NA	250	NA	9.6-9.59	NA	NA	NA	NA	NA
U.S.	Heptachlor	Processed food (Squash)	2004-08	-	NA	2305	52	0.003 - 0.059	NA	NA	NA	0	0
Germany	Heptachlor	Tea	2000-2009	-	NA	1238	NA	1.92-9.6	NA	NA	NA	NA	NA
Germany	Heptachlor	Vegetables	2000-2009	-	NA	717	NA	1.92-6.71	NA	NA	NA	NA	NA
U.S.	Heptachlor	Vegetables	2004-08	-	NA	287	3	0.007 - 0.026	NA	NA	NA	NA	NA
Spain	Heptachlor	Vegetables/ cucurbits	2007	-	0.01	167	1	0.02	-	-	-	NA	NA
Germany	Heptachlor	Water	2000-2009	-	NA	47	NA	0.33-4	NA	NA	NA	NA	NA
India	Heptachlor	Fruits (Apple)	Nov 07- Oct 08	-	0.01	1726	2	0.02-0.14	-	-	-	-	-

1. Though the EMRL is established for Citrus fruit, no monitoring data were provided ont this EMRL.
2. Some high residues were observed in German monitoring data for animal meat.

3. German data on fish and fruits show some high residues, however residues observed in data from the USA were generally low in fruit.
4. Both milk & Milk products monitored by Germany had occasional high residues.
5. Indian Poultry meat residues were generally low.
6. German data for tea and vegetables also showed occasional high residues.

74. HEXACHLOROBENZENE

The following table showed the commodity where the residue is above LOR.

Country	Compound	Commodity	Sampling period	Codex MRL	LOR (mg/kg)	Samples analysed	Samples > LOR	Range of positive samples (mg/kg)	No. of samples between LOR-1/5th ERL	No. of samples between LOR-1/5th ERL- 1/2 ERL	No. of samples between 1/2 ERL- ERL	No. of samples between ERL - Twice ERL	No. of samples twice MRL
U.S.	Hexachlorobenzene	Milk product (Heavy Cream)	2007	NA	NA	742	310	0.000	NA	NA	NA	NA	NA
U.S.	Hexachlorobenzene	Processed food (Winter Squash)	2004	NA	NA	215	1	0.003	NA	NA	NA	NA	NA
U.S.	Hexachlorobenzene	Vegetables	2004	NA	NA	173	1	0.002	NA	NA	NA	NA	NA

No significant residue found

9. LINDANE

The following table showed the commodity where the residue is above LOR.

Country	Compound	Commodity	Sampling period	Codex MRL	LOR (mg/kg)	Samples analysed	Samples > LOR	Range of positive samples (mg/kg)	No. of samples between LOR-1/5th ERL	No. of samples between LOR-1/5th ERL- 1/2 ERL	No. of samples between 1/2 ERL- ERL	No. of samples between ERL - Twice ERL	No. of samples twice MRL
India	Lindane	Animal Fat (mammals other than marine mammals)	Oct 06- Oct 07	0.1 fat	0.01	65	21	0.01-0.115	11	6	4	1	0

India	Lindane	Animal Meat (mammals other than marine mammals)	Nov 07- Oct 08	0.1 fat	0.01	200	1	0.014	1	0	0	0	0
India	Lindane	Cereal grains	Nov, 08-Dec, 09	0.01(*) various	0.01	1630	12	0.013 - 0.047				-	-
India	Lindane	Fish	Nov 07- Oct 08	-	0.01	714	4	0.01-0.17	-	-	-	5	6
India	Lindane	Fruits	Nov, 07-Dec, 09	-	0.01	4226	11	0.01 - 0.07				-	-
India	Lindane	Milk	Nov, 07-Dec, 09	0.01 (*)	0.01	1209	6	0.01 - 0.34	0	0	2	0	3
India	Lindane	Milk product (Butter)	Nov 07- Oct 08	See milk	0.01	441	5	0.01-0.04	-	-	-	2	2
India	Lindane	Poultry (Fat)	Oct 06- Oct 07	0.05 fat	0.01	35	8	0.013-0.045	0	5	3	0	0
India	Lindane	Pulses	Nov, 08-Dec, 09	-	0.01	542	1	0.01	-	-	-	-	-
India	Lindane	Spices	Nov 07- Oct 08	-	0.1	427	2	0.11-0.16	-	-	-	-	-
India	Lindane	Vegetables	Oct 06-Dec, 09	-	0.01	10902	59	0.01 - 1.212	-	-	-	-	-
India	Lindane	Water	Oct 06- Oct 07		0.0005	955	1	0.000675	-	-	-	-	-

Except India no other countries have submitted the monitoring data. There is no EMRL established for Lindane though MRLs were adopted in 2004 following the evaluation of lindane by the JMPR in 2003. Lindane was added to the POPs list in 2009.

10. MIREX

The following table showed the commodity where the residue is above LOR.

Country	Compound	Commodity	Sampling period	Codex MRL	LOR (mg/kg)	Samples analysed	Samples > LOR	Range of positive samples (mg/kg)	No. of samples between LOR-1/5th ERL	No. of samples between LOR-1/5th ERL- 1/2 ERL	No. of samples between 1/2 ERL- ERL	No. of samples between ERL - Twice ERL	No. of samples twice MRL
Germany	Mirex	Animal meat	2000-2009	-	NA	6963	NA	1-5.5	NA	NA	NA	NA	NA
Germany	Mirex	Fishes	2000-2009	-	NA	145	NA	1-6.1	NA	NA	NA	NA	NA
Germany	Mirex	Fruits	2000-2009	-	NA	2025	NA	6	NA	NA	NA	NA	NA
Germany	Mirex	Milk products	2000-2009	-	NA	174	NA	1	NA	NA	NA	NA	NA
Germany	Mirex	Spices	2000-2009	-	NA	954	NA	7	NA	NA	NA	NA	NA

Only German monitoring data are available in animal meat, fishes, fruits, Milk products and spices.

11. TOXAPHENE

The following table showed the commodity where the residue is above LOR.

Country	Compound	Commodity	Sampling period	Codex MRL	LOR (mg/kg)	Samples analysed	Samples > LOR	Range of positive samples (mg/kg)	No. of samples between LOR-1/5th ERL	No. of samples between LOR-1/5th ERL- 1/2 ERL	No. of samples between 1/2 ERL- ERL	No. of samples between ERL - Twice ERL	No. of samples twice MRL
Germany	Toxaphene	Animal meat	2000-2009	-	NA	12569	NA	1.0-8.0	NA	NA	NA	NA	NA
Germany	Toxaphene	Fishes	2000-2009	-	NA	3478	NA	1-6.5	NA	NA	NA	NA	NA
Germany	Toxaphene	Milk	2000-2009	-	NA	41	NA	1-1.3	NA	NA	NA	NA	NA
Germany	Toxaphene	Milk products	2000-2009	-	NA	724	NA	1	NA	NA	NA	NA	NA

Only German monitoring data are available in animal meat, fishes, Milk and , Milk products .