DDT (021)

EXPLANATION

DDT was first evaluated for residues in 1966 and has been reviewed several times since, most recently in 1996. ERLs were proposed for carrot, cereal grains, eggs, meat (from mammals other than marine mammals; temporary) and milks. At the 30th Session of the CCPR (ALINORM 99/24 para. 102), DDT was tentatively scheduled for residue evaluation in 2000 for consideration of an ERL in chicken meat, and the Committee agreed to request national monitoring data by a Circular Letter. Monitoring data on chicken meat were provided by Israel, the USA, Poland, Germany, the UK, and Thailand.

The Meeting also received information on national MRLs from Poland and The Netherlands, and on methods of residue analysis and monitoring surveys on fruits and vegetables from The Netherlands. The Meeting was informed by the governments of Germany and The Netherlands that no authorized uses of DDT exist in those countries.

At the 31st Session of the CCPR (ALINORM 99/24A paras. 115-121), there was discussion of the temporary ERL in meat of 5 mg/kg proposed by the 1996 JMPR. At a 0.5% violation rate, 3 mg/kg seemed to be an appropriate level on the basis of the 1996 evaluation, but this value did not conform to the geometric progression approach used by the JMPR for estimating maximum residue levels or ERLs. The CCPR requested the JMPR to reconsider the statistical validity of its proposal and its non-conformity to the geometric progression, on the basis of the 1996 evaluation.

METHODS OF RESIDUE ANALYSIS

Analytical methods

In the official methods of analysis of The Netherlands (Ministry of Health, Welfare and Sport, 1996) *p,p´*-DDT, its isomer *o,p´*-DDT and its metabolites are determined by a multi-residue method for pesticides amenable to gas chromatography.

Animal products. Fat is rendered and dissolved in light petroleum. Depending on the sample the solution is cleaned up by gel permeation chromatography or adsorption chromatography. The final extract is analysed by GLC with an ECD or by GC-MS.

Plant products. The sample is extracted with acetone/dichloromethane/light petroleum and cleaned up and analysed as above.

The limit of quantification was 0.05 mg/kg. Recoveries and repeatabilities (relative SD, n=10) at a fortification level of 0.29 mg/kg in various samples (not specified) were 96% ± 4.2% for *p,p´*-DDE and 99% ± 6.0% for *p,p´*-DDT.

USE PATTERN

The Meeting was informed that there were no authorized uses of products based on DDT in Germany and The Netherlands.

RESIDUES IN FOOD IN COMMERCE OR AT CONSUMPTION

The presentation of the data received differed from country to country, and the layouts in the Tables are consequently different. All residues are expressed as the sum of *p,p´*-DDT, *o,p´*-DDT, *p,p´*-DDE and *p,p´*-TDE (*p,p´*-DDD), in conformity with the Codex definition.

Monitoring of poultry fat in Israel (Table 1). Residues in poultry fat were reported for the period 1990-1998 by the Plant Protection and Inspection Services of Israel. The reporting limit was 2.5 mg/kg.

Table 1. Residues of DDT in poultry fat in Israel, 1990-1998 (Anon., 1999a).

Year	No. of samples	No. of samples containing residues below 2.5 mg/kg
1990	27	27
1991	58	58
1992	48	48
1993	71	71
1994	86	86
1998	187	187

Monitoring of chicken and turkey meat in the USA (Tables 2-5). The Meeting received information on the random monitoring of domestic samples in the period 1992-1998. The data from 1992, 1993 and 1994 were included in the 1996 JMPR evaluation. The data for the years 1995-1998 are shown in Tables 2-5. All residues are expressed on a fat basis. The reporting limit was not given, but presumably that of the 1996 JMPR evaluation of 0.01 mg/kg still applies.

Table 2. Residues of DDT in poultry meat in the USA, 1995 (Anon., 1999b)

Class	Residues, mg/kg								
	None	0.01-0.1	0.11-0.2	0.21-0.3	0.31-0.5	0.51-1.0	1.01-2.5	2.51-5.0	Over 5.0
Young chickens	482	2	0	0	0	0	1	0	0
Mature chickens	524	6	1	1	0	0	0	0	0
Young turkeys	505	17	0	0	1	0	0	0	0
Mature turkeys	244	15	0	0	1	0	1	0	0

Table 3. Residues of DDT in poultry meat in the USA, 1996 (Anon., 1999b)

Class	Residues, mg/kg								
	None	0.01-0.1	0.11-0.2	0.21-0.3	0.31-0.5	0.51-1.0	1.01-2.5	2.51-5.0	Over 5.0
Young chickens	176	2	0	0	0	0	0	0	0
Mature chickens	183	3	1	0	0	0	0	0	0
Young turkeys	381	9	1	0	0	0	0	0	0
Mature turkeys	64	4	0	0	0	0	0	0	0

Table 4. Residues of DDT in poultry meat in the USA, 1997 (Anon., 1999b)

Class	Residues, mg/kg								
	None	0.01-0.1	0.11-0.2	0.21-0.3	0.31-0.5	0.51-1.0	1.01-2.5	2.51-5.0	Over 5.0
Young chickens	273	1	0	0	0	0	0	0	0
Mature chickens	101	1	0	0	0	0	0	0	0

Class	Residues, mg/kg								
	None	0.01-0.1	0.11-0.2	0.21-0.3	0.31-0.5	0.51-1.0	1.01-2.5	2.51-5.0	Over 5.0
Young turkeys	148	0	0	0	0	0	0	0	0
Mature turkeys	107	0	0	0	0	0	0	0	0

Table 5. Residues of DDT in poultry meat in the USA, 1998 (Anon., 1999b)

Class	Residues, mg/kg								
	None	0.01-0.1	0.11-0.2	0.21-0.3	0.31-0.5	0.51-1.0	1.01-2.5	2.51-5.0	Over 5.0
Young chickens	268	1	0	0	0	0	0	0	0
Mature chickens	94	0	1	0	0	0	0	0	0
Young turkeys	245	0	0	0	1	0	0	0	0
Mature turkeys	145	5	0	0	0	0	0	0	0

Monitoring of chicken fat in Poland (Table 6). Residues in chicken fat were reported for the period 1996-1999 from the National Veterinary Monitoring Program of Poland. Samples were from random monitoring of slaughtered animals. The reporting limit was 0.01 mg/kg.

Table 6. Residues of DDT in chicken fat in Poland, 1996-1999 (Anon., 1999c)

Year	No. of samples	<LOQ	No. of samples in range, mg/kg					
			<0.10	>0.10-0.20	>0.20-0.50	>0.50-1.00	>1.00-2.00	>2.00
1996	408	54	334	15	2	3	0	0
1997	406	124	261	8	4	5	4	0
1998	218	57	153	5	3	0	0	0
1999	182	59	121	1	1	0	0	0

Monitoring of chicken meat in Germany (Table 7). Monitoring data on domestic (81%) and import samples of chicken meat were supplied by the Bundesinstitut für gesundheitlichen Verbraucherschutz und Veterinärmedizin. Results apply to the fat of the meat. The limit of reporting (LOQ, mg/kg) was 0.0001-0.1 (mainly 0.001-0.01).

Table 7. Residues of DDT in fat of chicken meat in Germany, 1994-1997 (Anon., 1999d)

No. of samples	No. of samples in range, mg/kg											
	<LOQ	<0.005	0.005-0.01	>0.01-0.02	>0.02-0.05	>0.05-0.1	>0.1-0.2	>0.2-0.5	>0.5-1.0	>1.0-2.0	>2.0-5.0	>5.0
215	147	9	24	16	7	4	3	3	1	1	-	-

Monitoring of chicken meat in the UK (Table 8). Residues in poultry commodities were reported for the period 1990-1996. The various limits of reporting are indicated in the Table.

Table 8. Residues in poultry commodities in the UK, 1990-1996 (Anon.)

Year	No. of samples	No. of samples in range, mg/kg											
		<LOQ	≤0.005	>0.005-0.01	>0.01-0.02	>0.02-0.05	>0.05-0.1	>0.1-0.2	>0.2-0.5	>0.5-1.0	>1.0-2.0	>2.0-5.0	>5.0-10
Chicken meat (LOQ, mg/kg: 0.002 (1995), 0.01 (1992 & 1990))													
1995	37[1]	37	37										
	35[2]	35	35										

Year	No. of samples	No. of samples in range, mg/kg											
		<LOQ	≤0.005	>0.005-0.01	>0.01-0.02	>0.02-0.05	>0.05-0.1	>0.1-0.2	>0.2-0.5	>0.5-1.0	>1.0-2.0	>2.0-5.0	>5.0-10
1992	72	64		64		7	1						
1990	118	115		115	2	1							
Chicken liver (LOQ, mg/kg: 0.008 (1994), 0.01 (1991))													
1994	31	30	30		1								
91	18	18											
Poultry (**may or may not be chicken**) (LOQ 0.002 mg/kg)													
1996	24	21	24										
Total diet study (1) carcass meat (may or may not be chicken), LOQ 0.01 mg/kg (2) composite offal, LOQ 0.002 mg/kg (3) composite meat products, LOQ 0.01 mg/kg													
1996	24 (1)	16		16			8[3]						
1996	24 (2)	18	18		6[4]								
1996	24 (3)	22		22	2								
Canned meat (may or may not be chicken; LOQ 0.01 mg/kg)													
1993	36	22		22		14[5]							

[1] Samples were lean breast
[2] Samples were chicken, >10% fat
1992 & 1990 data reported and residues quoted on a fat basis
[3] these cover the range 0.01-0.07. No further details available
[4] these cover the range 0.002-0.02. No further details available
[5] these cover the range 0.01-0.05. No further details available

Monitoring of poultry meat in Thailand (Table 9). Data on random monitoring of poultry meat from various slaughter plants in the period 1997-1999 were supplied by the Thai Veterinary Public Health Laboratory. The portion analysed was the abdominal fat. The limit of quantification (LOQ) was 0.01 mg/kg, the limit of reporting was 0.003 mg/kg. Recoveries were within the limits 70-110%. Samples were stored before analysis below 0°C for 14 days or less.

Table 9. Residues of DDT in chicken and duck meat in Thailand, 1997-1999 (Anon.)

Sample	Year	No. of samples	No. of residues detected	No. of residues <LOQ (<0.01 mg/kg)	No. of samples in range, mg/kg								
					0.01-0.04	0.05-0.08	0.09-0.12	0.13-0.16	0.17-0.20	0.21-0.50	0.51-1.00	1.01-2.00	>2.00
Chicken meat	1997	3882	3834	132	3113	477	71	13	11	13	-	2 (1.80, 1.10)	2 (2.50, 2.40)
	1998	2910	2734	747	1801	156	16	4	5	4	-	1 (1.20)	-
	1999	2537	2033	690	1208	93	24	6	3	6	2	1 (1.54)	-
Duck meat	1997	399	369	73	288	5	-	-	2	1 (0.24)	-	-	-
	1998	464	381	264	115	2	-	-	-	-	-	-	-
	1999	96	46	36	10	-	-	-	-	-	-	-	-

Residues of DDT in foods of plant origin in The Netherlands (Table 10). The 1993 JMPR reported monitoring data on DDT residues for the period 1987-1991. The 1996 JMPR reported additional data for 1991-1993 and 1994. The present Meeting received information for 1994-1996.

Table 10. Residues of DDT in foods of plant origin in The Netherlands, 1994-1996 (Anon. 2000).

Crop	Samples						MRL, mg/kg
	No.	Without residues (LOQ* = 0.05)	Residues <MRL	Residues >MRL	Range, >MRL	Mean**, mg/kg	
Citrus fruit							
Grapefruit	327	45	-	-	-	<0.05	0.05*
Other fruit and fruit products	469	467	-	2	0.05-0.12	<0.05	0.05*
Root and tuber vegetables							
Carrots	500	497	-	3	0.07-1.6	<0.05	0.05*
Fruiting vegetables							
Tomatoes	1242	1242	-	-	-	< 0.05	0.05*
Melons	455	455	-	-	-	< 0.05	0.05*
Leaf vegetables and fresh herbs							
Iceberg lettuce	535	534	-	1	0.05	< 0.05	0.05*
Parsley	390	390	-	-	-	< 0.05	0.05*
Other herbs	224	224	-	-	-	< 0.05	0.05*
Legume vegetables							
Beans (without pods)	45	45	-	-	-	<0.05	0.05*
Other stem vegetables	375	375	-	-	-	<0.05	0.05*

* Lower limit of quantification
** For samples without residues (<LOQ), half the LOQ is taken for the calculation of the mean.

Statistical analysis

The monitoring data were reported as summaries in tables in which only the number of results within certain classes were given. This has advantages since it concentrates the data into a small table and allows rapid visual interpretation. The disadvantages are that comparison of the tables might be difficult (the definition of the classes can be different) and that parameters like "the critical level where only 0.2 % of the results is above the critical level" are hard to determine.

A statistical approach was used to solve this problem, based on the assumption that each set of data can be described by a log-normal distribution. The two parameters of the distribution were estimated by maximising the probability of observing the numbers reported in the classes. Since in the available data sets the amount of information was rather limited, combinations of sets were made (for example the same standard deviation was used for all data sets except those of Thailand and, for mammalian meat, of New Zealand).

Data on mammalian meat were collected from the 1996 JMPR evaluation of DDT. Some data on chicken meat also derive from the 1996 evaluation. Additional data on chicken meat were provided to the Meeting by Israel, the USA, Poland, Germany, the UK, and Thailand (monitoring data). The origin of the data is tabulated in Annex III. The poultry data set has 68 items and the mammalian data set 103.

The data were pretreated in the following way. Data which were in internally inconsistent (for example the sum of the numbers in the classes was not equal to the reported sums) were rejected. Mixed sets of data (for example poultry and pork) were rejected. The Australian data report the residues of DDT, DDE and TDE separately instead of expressing them as total DDT. To combine the data the standard deviations of the different components within one set are assumed equal and the resulting concentrations are then summed. Classes sometimes did not cover the whole range, presumably owing to rounding. For example in some cases the first class was 0-0.1 and the second was 0.11-0.2. Then the region between 0.1 and 0.11 would “not exist” in the distribution. Such situations are therefore interpreted as class 1 being 0.00000001-0.105 and class 2 as 0.105-0.2. Note also that zero is replaced by a very small number since the log of zero is not a number.

The estimated probability of a result falling in a certain class, p_i, is calculated by using the cumulative function of the log-normal distribution with the boundaries as the boundaries of the integration interval. Then for each class the value $f_i \ln(f_i/np_i)$ is calculated (n = total number of results

and f_i is the reported number of results in this class)[1]. The sum of these values for all classes represents the log-probability of the particular values for the two parameters of the log-normal distribution. The difference in log-probability is also used to test whether one set of parameters fits significantly better than another set of parameters. Note that in the (unlikely) event of a perfect fit, all $np_i=f_i$, yields a zero value for the log-probability. For a fit that is less than perfect the log-probability value will be lower. In general, the better the fit the higher the log-probability.

Results, poultry. When a separate value for the median and standard deviation is allowed for each set the sum of all log-probabilities is -277. Using a log-normal distribution the log-probability for this data set cannot be larger. If a single value for all relative standard deviations (RSDs) is applied for all items in the poultry data set the log-probability decreases to -1109. This difference is quite significant compared to the difference in the number of parameters (67). The data sets from Thailand show RSDs that are generally lower than these combined value therefore this set was treated as a separate class. The log-probability is then –672. The latter calculations were used for further evaluation. The detailed results and calculations are shown in Annex III.

Annex III shows the treatment of the information for both poultry and mammals using the 2 RSDs calculation for poultry and the 3 RSDs calculation for mammals. It shows the source of the data and commodity/animal/sex/age and year(s) of sampling, then the total number of samples and the numbers in selected concentration intervals (mg/kg), and then a check on the consistency of these numbers and calculated distribution parameters (median and RSD). The average and the calculated number of samples above a certain level are also given. The last columns show for each item the estimated levels that correspond to the stated percentiles.

Results, mammals. Using the same calculation strategy for mammals as for poultry the log-probability for a separate value for the median and standard deviation for each set is -685. Using one value for all standard deviations the value decreases to -1510 (102 parameters). Again the data sets from Thailand show RSDs that are generally lower than the combined values so these sets were treated as a separate class, giving a log-probability of -1293. Furthermore, since the data sets from New Zealand contain higher residues than the other data sets these sets were also treated as a separate class. The log-probability is then –1155. The latter calculations are used for further evaluation. The details are shown in Annex III.

The advantage of combining the RSDs of various sets is a gain in accuracy, the disadvantage might be that some sets are combined with values that are significantly different. In principle, more sophisticated combinations of RSDs and even of medians are possible to refine the calculations. However the available information is not detailed enough to make additional valid combinations.

NATIONAL MAXIMUM RESIDUE LIMITS

The Meeting was informed of the following national MRLs for DDT.

For plant and animal products the residue is defined as the sum of *o,p´*-DDT, *p,p´*-DDT, *p,p´*-DDE and *p,p´*-TDE (*p,p´*-DDD), expressed as DDT.

Country	Commodity	MRL, mg/kg, expressed as DDT	Remarks
Israel	Poultry fat (PF 111)	5	
USA	poultry	No tolerance; 5 ppm action level	

[1] R.R, Sokal and F.J. Rohlf, “Biometry” 3rd edition (1995) Freeman and Co New York

Country	Commodity	MRL, mg/kg, expressed as DDT	Remarks
Germany	Chicken meat	1 (fat)	
UK	Chicken meat	1	
	Chicken liver	0.1	
Thailand	Poultry meat	1 (fat)	
	Poultry edible offal	1 (fat)	
Netherlands	Tea	0.2	
	Cocoa products	0.5	1)
	Meat	1	2)
	Milk	0.04	3)
	Eggs	0.1	4)
	Eel	1	
	Liver of fish	2	
	Other fishery products	0.5	
	Wild and poultry	1	2)
	Other animal oils and fats	1	
	Other food commodities	0.05*	
Poland	Fruits except for citrus fruits	0.05	
	Cereal grains	0.05	
	Citrus fruits	0.05	
	Eggs	0.1	
	Hops, dry	0.05	
	Meat and meat products	1.0	
	Milks and milk products	0.04	
	Potato	0.05	
	Tea	0.1	
	Vegetables	0.05	

1) Expressed as mg/kg fat
2) In the case of foodstuffs with a fat content of 10% or less by weight, the residue is related to the total weight of the boned foodstuff. In such cases, the maximum level is one-tenth of the value related to fat content, but must be no less than 0.01 mg/kg.
3) In determining the residues in raw cow's milk and whole cream cow's milk, a fat content of 4% by weight should be taken as a basis. For raw milk and whole cream milk of another animal the residues are expressed on the basis of the fat: with a fat content of less than 2% by weight, the maximum level is taken as half that set for raw milk and whole cream milk; with a fat content of 2% or more by weight, the maximum level is expressed in mg/kg of fat. In such cases, the maximum level is 25 times that set for raw milk and whole cream milk.
4) For eggs and egg products with a fat content higher than 10% the maximum level is expressed in mg/kg fat. In this case the maximum level is 10 times higher than the maximum level for fresh eggs.

* Indicates lower limit of quantification (LOQ)

APPRAISAL

DDT was first evaluated in 1966 and has been reviewed several times since. The existing Codex MRL for meat, 5 mg/kg (fat), was converted to a temporary limit in 1993. The Joint Meeting in 1993 and 1994 proposed extraneous residue limits (ERLs) for carrot, eggs, meat, and milk and confirmed the previous temporary ERL proposed for cereal grains. For meat, the 1993 JMPR proposed an ERL of 1 mg/kg. On the basis of new data on residues received from the Government of New Zealand, the 1996 JMPR concluded that the ERL of 1 mg/kg for DDT in meat (fat) recommended by the 1993 JMPR should be increased to 5 mg/kg.

At its 31st session, the CCPR (ALINORM 99/24A paras. 115-121) discussed the temporary ERL in meat of 5 mg/kg. On the basis of a 0.5% rate of violation of this value, 3 mg/kg appeared to be an appropriate value from the 1996 evaluation. This value does not, however, conform to the geometric progression approach used by the Meeting for estimating MRLs and ERLs. The CCPR requested the JMPR to reconsider its proposal on statistical validity and non-conformity to the geometric progression, on the basis of the 1996 JMPR evaluation.

Residues in animal commodities

The CCPR at its 30th session (ALINORM 99/24 para. 102) requested the Meeting to evaluate data derived from monitoring of chicken meat in its consideration of an ERL for that commodity. These data were provided to the Meeting from Germany, Israel, Poland, Thailand, the UK, and the USA. The Meeting also received national residue limits from The Netherlands and Poland and methods for residue analysis and monitoring of fruits and vegetables from The Netherlands. The Meeting was informed by the Governments of Germany and The Netherlands that no uses for DDT are authorized in those countries.

The results of monitoring of DDT residues were summarized in tables in which only the number of results within certain classes was given. This method of reporting has the advantages of concentrating data and allowing rapid visual interpretation. The disadvantages are that such tables are difficult to compare (the definition of classes might differ) and parameters such as "the critical level at which only 0.2% of the results is above the critical level" are difficult to determine. A statistical solution to this problem was used which is based on the assumption that each set of data can be described by a log-normal distribution. The two parameters of this distribution were estimated by maximizing the likelihood of observing the numbers reported in the classes. Since the amount of information in the data sets was rather limited, combinations of sets were made. The same standard deviation was used for all data sets except those of Thailand, and, in the case of mammalian meat, New Zealand.

A total of 103 data sets on *mammalian meat* was abstracted from the 1996 JMPR evaluation of DDT. The data sets were derived from Australia, Germany, New Zealand, Norway, Thailand, the UK, and the USA. As the data from New Zealand showed higher concentrations of residues than those from other countries, the calculations were also performed exclusively for the New Zealand data. Nevertheless, one set of data on lamb meat from a region of New Zealand with a known history of exposure to DDT was not incorporated in either calculation (see 1996 JMPR DDT evaluation, Table 4).

Since the number of samples analysed in each data set varied widely, the calculations were repeated after introduction of a weighting factor to correct for the size of the data set, giving more weight to the large ones. This procedure does justice to each sample analysed, but it has a greater effect on the outcome of the calculations for those countries that provided the larger data sets.

The estimated percentage of samples in which the concentration of residues exceeds a certain concentration is called the "violation rate". Shown below for violation rates of 0.1. 0.2, and 0.5% are the average corresponding concentrations based on all the data sets, both giving each data set the same weight and weighting each data set according to the number of samples analysed. The second table gives the same information only from the data sets provided by New Zealand. In the parameter estimations, data sets are not included in the ranges where they have no discriminating power. For example, as the New Zealand data sets contain ≤310 samples they cannot discriminate below a violation rate of 0.3%. Once the parameters are established, they can be used to extrapolate to concentrations below 0.3%.

Weighted average of the estimated concentration of DDT (sum of *ortho,para'*-DDT, *para,para'*-DDT, *para,para'*-DDE, and *para,para'*-TDE (*para,para'*-DDD), expressed as DDT) in mammalian meat (fat) samples at various violation rates. Calculations based on data sets from Australia, Germany, New Zealand, Norway, Thailand, the UK, and the USA.

Concentration, mg/kg	Violation rate (%)		
	0.1	0.2	0.5
Average	2.1	1.4	0.8
Weighted average	1.9	1.2	0.6

Weighted average of the estimated concentration of DDT (sum of *ortho,para'*-DDT, *para,para'*-DDT, *para,para'*-DDE, and *para,para'*-TDE (*para,para'*-DDD), expressed as DDT) in mammalian meat (fat) samples at various violation rates. Calculations based on data sets from New Zealand only

Concentration, mg/kg	Violation rate (%)		
	0.1	0.2	0.5
Average	3.9	2.7	1.7
Weighted average	4.8	3.4	2.1

Data sets on *poultry meat* were provided to the Meeting by Germany, Israel, Poland, Thailand (monitoring data), the UK, and the USA, and additional data sets from Australia, Germany, Norway, Thailand, the UK, and the USA were collected from the 1996 JMPR evaluation on DDT, yielding a total of 68 data sets. The same calculations were performed as for mammalian meat, and the results are given below, where for violation rates of 0.1. 0.2, and 0.5% the average corresponding concentration is shown when each item has the same weight and when each item is weighted by the number of samples analysed in the set.

Weighted average of the estimated concentration of DDT (sum of *ortho,para'*-DDT, *para,para'*-DDT, *para,para'*-DDE, and *para,para'*-TDE (*para,para'*-DDD), expressed as DDT) in poultry meat (fat) samples at various violation rates. Calculations based on data sets from Australia, Germany, Israel, Norway, Poland, Thailand, the UK, and the USA

Concentration, mg/kg	Violation rate (%)		
	0.1	0.2	0.5
Average	0.19	0.15	0.10
Weighed average	0.29	0.24	0.19

RECOMMENDATIONS

The Meeting estimated the range of ERLs shown below from the available monitoring data as described above. It concluded that selection of an acceptable violation rate and the weight to be given to information provided by individual countries are risk management issues, not scientific ones. The CCPR should decide which violation rate is acceptable and whether each contributing country or each analysed sample should be given the same weight. When this is decided, suitable ERLs for mammalian and chicken meat can be derived from the Tables, in which the estimated concentrations of total DDT are given for violation rates of 0.1, 0.2, and 0.5%.

For dietary intake calculations, as a worst case assumption, the highest ERLs of 5 mg/kg for mammalian meat and 0.3 mg/kg for poultry meat were used. This resulted in exposures well below the PTDI.

Commodity		ERL, mg/kg	
CCN	Name	New[1]	Previous
MM 0095	Meat (from mammals other than marine mammals)	1-5 (fat)	5 (fat)[2]
PM 0110	Poultry meat	0.1-0.3 (fat)	-

[1] The Meeting estimated the total concentrations of DDT corresponding to violation rates of 0.1%, 0.2% and 0.5% for mammalian and poultry meat according to the procedure described in Sec. 4.7 of this Report.

[2] Recommendation by the 1996 JMPR

Dietary risk assessment

Chronic intake

ERLs for DDT exist for carrot, cereal grains, eggs, and milk. The present Meeting estimated the concentrations of DDT for violation rates of 0.1, 0.2, and 0.5% in meat from mammals other than marine mammals and from poultry. For dietary intake calculations, the 'worst case' was assumed to be the highest values in the tables. Thus, 5 mg/kg for mammalian meat and 0.3 mg/kg for poultry meat would be used.

The IEDI values from the five GEMS/Food regional diets, based on ERLs, were 10-30% of the PTDI of 0.01 mg/kg bw. The Meeting concluded that the long-term intake of residues of DDT resulting from its presence in carrots, cereal grains, eggs, milk, and meat (both mammalian and poultry) has been considered by the JMPR and is unlikely to present a public health concern.

Short-term intake

The Meeting concluded that an acute RfD for DDT is unnecessary. This conclusion was based on a determination that the residues of this contaminant are unlikely to present an acute risk to consumers.

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