HALOXYFOP (194)

EXPLANATION

Haloxyfop was first evaluated in 1995 and again in 1996. The Meeting noted that the expected levels of residue intake by cattle would exceed the maximum dose used in the animal feeding studies and therefore requested further ruminant feeding studies at feeding levels comparable to the maximum residue levels found in fodder crops. Information on the moisture content of fodder crops was also considered desirable.

METHODS OF RESIDUE ANALYSIS

Muscle, liver and kidney samples were extracted with methanolic sodium hydroxide, ether and sodium hydrogen carbonate solution. Rendered fat was dissolved in toluene and the fat precipitated with acetonitrile, which was evaporated. Milk was acidified and extracted with ether, which was evaporated and the residue dissolved in toluene. Acetonitrile was added and subsequently removed by evaporation. Haloxyfop was derivatized to the methyl ester, which was cleaned up by gel permeation chromatography and determined by GLC with an ECD (Anon., 1999a). *o,p*-DDE was used as an internal standard. Mean recoveries were 117, 98, 99, 108 and 113% at 0.01 mg/kg for liver, kidney, muscle, fat and milk respectively (Anon., 1999c).

Animal feeding studies

Twelve Friesian cows each weighing 452-568 kg were dosed twice daily for 28 days with gelatin capsules containing haloxyfop-R equivalent to 10, 20 or 30 ppm in the diet (100, 200 or 300 mg/animal/day). Milk was collected morning and evening to form a daily sample although samples from every collection day were not analysed.

One of the control cows became photosensitive resulting in superficial mastitis with a painful udder and was withdrawn from the study. Three weeks after the trial a control cow aborted. Post-mortem examination revealed that the abortion was Aspergillus-induced. All other cows remained healthy throughout the trial (Anon., 1999b).

Table 1. Residues of haloxyfop-R in milk (Anon., 1999b).

Day	Residue, mg/kg			
	Control	10 ppm	20 ppm	30 ppm
-2	0.02, ND, ND	0.008, ND, ND	ND, ND, ND	ND, ND, ND
1	ND, 0.01, 0.01	0.008, 0.008, 0.01	0.02, 0.01, 0.02	0.03, 0.02, 0.02
2		0.12, 0.14, 0.20	0.33, 0.19, 0.39	0.24[1], 0.42, na
6		0.18, 0.20, 0.23	0.40, 0.24, 0.43	0.27[1], 0.57, 0.54
10		0.33, 0.31, 0.38	0.59, 0.48, 0.87	0.42[1], 1.83, 1.29
14		0.28, 0.20, 0.27	0.56, 0.36, 0.54	0.28[1], 0.73, 0.60
18		0.22, 0.22, 0.29	0.54, 0.28[2], 0.70	0.33[1], 0.74, 0.70
22		0.23, 0.17, 0.25	0.56, 0.20[2], 0.59	0.20[1], 0.72, 0.63
26		0.58, 0.37, 0.65	0.91, 0.22[2], 0.97	0.37[1], 2.21, 1.01
29	ND			
30		0.40, 0.09, 0.32	0.59, 0.09[2], 0.48	0.19[1], 0.95, 0.61
34		0.13, 0.008, 0.07	0.06, 0.03, 0.04	0.02[1], 0.52, 0.04
38		0.008, ND, 0.009	0.01, ND, 0.005	ND[1], 0.07, 0.07
42	ND, ND	ND, ND, ND	0.005, ND, 0.01	ND[1], 0.11, 0.003

ND: undetectable, <0.002 mg/kg
NA: not analysed
[1] One cow (cow 95) in group consistently showed low residues
[2] One cow (cow 54) in group consistently showed low residues particularly from days 14-30

In the trial reported to the 1995 Meeting residues in the milk of cows fed the equivalent of 2.5 ppm haloxyfop in the diet for 28 days (Gardner, 1984) reached a maximum of 0.04 mg/kg at day 20.

In another trial 24 beef cattle weighing 450-650 kg were dosed twice daily for 28 days with gelatin capsules containing the equivalent of 10, 20 or 30 ppm haloxyfop-R in the diet. Cattle were slaughtered on day 28, and some animals in the 30 ppm group on days 35, 42, 49 and 56. Animals remained healthy throughout the study except one cow which suffered a haematoma and another a heel abscess. No abnormalities were seen on post mortem examination (Anon., 1999d).

Table 2. Residues of haloxyfop-R in the tissues of beef cattle (Anon., 1999d)

Sample	Residue, mg/kg			
	Control	10 ppm diet	20 ppm diet	30 ppm diet (day 28)
Liver	ND, ND, ND	0.23, 0.33, 0.20	0.38, 0.45, 0.30	0.46, 0.20, 0.18
Kidney	0.02, 0.01, 0.01	0.51, 0.53, 0.57	1.13, 1.49, 0.53	1.17, 0.48, 1.81
Muscle	ND, ND, ND	0.02, 0.05, 0.02	0.06, 0.06, 0.03	0.05, 0.01, 0.05
Abdominal fat	ND, ND, ND	0.02, 0.008, 0.01	0.05, 0.03, 0.03	0.02, 0.02, 0.04
Renal fat	0.009, 0.007, ND	0.02, 0.005, 0.01	0.04, 0.02, 0.02	0.02, 0.02, 0.04
Subcutaneous fat	ND, ND, ND	0.02, 0.01, 0.008	0.03, ND, 0.03	0.02, 0.01, 0.03
	30 ppm diet (day 35)	30 ppm diet (day 42)	30 ppm diet (day 49)	30 ppm diet (day 56)
Liver	0.09, 0.12, 0.06	0.02, 0.01, 0.03	0.01, 0.02, 0.006	0.007, 0.006, ND
Kidney	0.07, 0.11, 0.07	0.02, 0.01, 0.02	0.02, 0.01, 0.009	0.006, 0.018, 0.009
Muscle	0.006, ND ,ND	ND, ND, ND	ND, ND, ND	ND, ND, ND
Abdominal Fat	0.02, 0.008, 0.01	0.007, ND, 0.007	0.02, ND, 0.03	0.02, 0.008, 0.006
Renal Fat	0.008, 0.01, 0.02	0.009, 0.007, 0.007	0.05, 0.02, 0.04	0.03, 0.02, 0.03
Subcutaneous Fat	0.008, ND, ND	ND, ND, ND	ND, ND, ND	ND, ND, ND

ND: undetectable (<0.005 mg/kg liver, kidney, muscle, 0.003 mg/kg fat)

Residues of haloxyfop-R were not closely correlated with dose levels, with residues in the 20 and 30 ppm groups at similar levels.

In an earlier trial reported to the 1995 JMPR beef calves had been dosed with haloxyfop daily for 28 days at levels equivalent to 0, 0.25, 0.5, 1, 5 and 10 ppm in the diet on a dry matter basis (Kutschinski and Bjerk, 1984a). Three animals at each feeding level were slaughtered without a withdrawal period and three at the highest feeding level were slaughtered seven days and three fourteen days after the last dose. The residues relevant to the estimation of maximum residue levels and STMRs are shown below (FAO/WHO, 1996b).

Table 3. Residues of haloxyfop in the tissues of calves after dosing for 28 days (Kutschinski and Bjerk, 1984a).

Tissue	Residue, mg/kg at indicated intake		
	5 ppm diet	10 ppm diet	10 ppm diet (7 days withdrawal)
Muscle	0.01	0.02 – 0.06	<0.01
Liver	0.14 - 0.15	0.40 – 0.72	0.02 – 0.03
Kidney	0.35 - 0.51	0.83 – 1.90	0.03 – 0.06
Fat	0.06 - 0.09	0.24 – 0.53	0.07 – 0.21

Only residues in muscle occurred at similar levels in the two studies; in all other cases, residues were higher from the earlier trial in which dosing was with the racemate.

In another trial reported to the 1995 JMPR laying hens were fed haloxyfop each day for 28 days at 0, 0.25, 0.75 and 2.5 ppm in the diet on a dry matter basis (Kutschinski and Bjerk, 1984b). Hens in all groups were killed immediately after the last dose, and one high-level group was killed seven days and one fourteen days after the last dose. Eggs from each group were collected daily and eggs, muscle with attached skin, liver and fat were analysed for residues of haloxyfop and its conjugates by GLC with a limit of quantification of 0.01 mg/kg. The results are shown in Table 4.

Table 4. Residues in chicken tissues and eggs resulting from ingestion of haloxyfop

Tissue	Residue, mg/kg, at indicated intake				
	0.25 ppm	0.75 ppm	2.5 ppm	2.5 ppm [1]	2.5 ppm [2]
Muscle/Skin	<0.01	<0.01 – 0.02	0.02 – 0.12	<0.01 – 0.02	<0.01 – 0.03
Liver	0.01 – 0.09	0.06 – 0.20	0.19 – 0.68	<0.01 – 0.02	<0.01 – 0.01
Fat	<0.01 – 0.03	0.02 – 0.12	0.12 – 0.60	0.04 – 0.75	0.06 – 0.34
Eggs	<0.01	0.02	0.04	0.01	<0.01

[1] After 7 days withdrawal
[2] After 14 days withdrawal

APPRAISAL

Haloxyfop was evaluated for the first time in 1995 and again in 1996. The 1995 JMPR provisionally estimated maximum residue levels for a number of commodities, including fodder crops and commodities of animal origin, noting the lack of critical supporting data on the uptake of the soil degradation products by crops. The 1996 JMPR received reports of studies on the uptake of the parent compound or its degradation products from soil treated with haloxyfop but agreed to withdraw the provisional maximum residue levels for fodder crops and cattle tissues and milk, as no information was available on the moisture content of fodder crops, and the expected intake of residues by cattle would exceed the maximum dose used in the feeding studies. It therefore requested the results of further feeding studies in which ruminants were fed a concentration comparable to the maximum residue level found in fodder crops. Information on the moisture content of fodder crops was also noted as desirable.

The Meeting received information on methods of analysis for milk and cattle tissues and feeding studies in dairy and beef cattle.

Results of supervised trials

Estimation of STMR values for fodder crops for which provisional maximum residue levels were estimated by the 1995 JMPR

The 1995 JMPR estimated provisional MRLs of 5.0 mg/kg for alfalfa forage (green), 0.3 mg/kg for beet leaves or tops, and 0.3 mg/kg for sugar beet leaves or tops. The 1996 JMPR agreed to withdraw these provisional recommendations because the concentrations of residues found in supervised trials on these fodder crops were expressed on a wet weight basis, whereas the Codex Classification of Food and Feeds indicates that MRLs for fodder and forage crops should, if relevant, preferably be set and expressed on a ‘dry weight’ basis; furthermore, no information was available on the moisture content of these commodities. The current Meeting agreed to reinstate the recommended MRLs for these commodities, with a footnote to indicate that the MRLs are set on a fresh weight basis.

The concentrations of residues on alfalfa from two trials conducted in Australia in compliance with the maximum GAP for haloxyfop (0.16 kg ai/ha; PHI 21 days) and two trials conducted in

Australia in compliance with the maximum GAP of Australia for haloxyfop-R (0.078 kg ai/ha; PHI, 21 days), in ranked order, were (median underlined): 1.8, 2.2, 2.4 and 3.1 mg/kg.

The Meeting agreed to reinstate the recommended MRL of 5 mg/kg (on a fresh weight basis) and estimated an STMR value of 2.3 mg/kg and an HR of 3.1 mg/kg.

Both the 1995 and the 1996 JMPR agreed to consider the data for beet and sugar beet fodder together, as these crops and the use pattern of haloxyfop on them are similar.

In 13 trials on sugar beet carried out in the United Kingdom with racemic haloxyfop according to the maximum French GAP (0.21 kg ai/ha, up to early weed tillering), the concentrations of residues in the leaves and tops were < 0.02 (3), 0.02, < 0.03 (3), 0.03, 0.04 (2), 0.09, 0.11 and 0.28 mg/kg. In eight trials on sugar beet carried out in Germany with racemic haloxyfop according to the maximum German GAP (0.21 kg ai/ha; PHI, 90 days), the concentrations in the leaves and tops were < 0.01, < 0.02 (2), 0.03, 0.04, 0.08, 0.28 and 0.3 mg/kg. In four trials on sugar beet with haloxyfop-R in Germany and Italy conducted according to maximum French GAP (0.1 kg ai/ha, up to early weed tillering), the concentrations of residues in the leaves and tops were < 0.02, 0.09 (2) and 0.14 mg/kg.

In five trials on fodder beet with racemic haloxyfop conducted in Germany according to maximum German GAP (0.21 kg ai/ha; PHI, 90 days), the concentrations in the leaves or tops were < 0.02 (3), 0.03 and 0.05 mg/kg.

The concentrations of residues in the leaves or tops in a total of 30 trials, in ranked order, were: < 0.01, < 0.02 (9), 0.02, < 0.03 (3), 0.03 (3), 0.04 (3), 0.05, 0.08, 0.09 (3), 0.11, 0.14, 0.28 (2) and 0.3 mg/kg. The Meeting agreed to reinstate the recommended MRL of 0.3 mg/kg (on a fresh weight basis) and estimated an STMR value of 0.03 mg/kg and a highest residue of 0.3 mg/kg.

In four supervised trials on pasture with racemic haloxyfop and two with haloxyfop-R in Australia conducted in accordance with maximum Australian GAP (0.1 kg ai/ha with racemic haloxyfop, 0.052 kg ai/ha with haloxyfop-R; PHI, 7 days in both cases), the concentrations of residues, in ranked order, were 0.49, 0.99, 1.5, 1.7, 2.0 and 3.4 mg/kg.

The Meeting estimated an STMR value of 1.6 mg/kg and an HR value of 3.4 mg/kg. As pasture is not traded internationally in bulk, no maximum residue level was estimated.

Residues in animal commodities

Feeding studies

Haloxyfop-R (as its methyl ester) was determined in milk and cattle tissues by GC–ECD after solvent extraction and derivatization, with 98–117% recovery.

Dairy cows were dosed with haloxyfop-R at rates equivalent to 0, 10, 20 or 30 ppm of diet for 28 days. Residues were detected rapidly in milk (1 day after treatment), and the concentration appeared to reach a plateau by day 10 and a peak at day 26. The maximum concentrations in milk were 0.65 mg/kg at 10 ppm of diet, 0.97 mg/kg at 20 ppm and 2.2 mg/kg at 30 ppm. The concentrations varied widely between cows, and one cow each at 20 and 30 ppm had consistently low values. In the study considered by the 1995 Meeting, in which cows were dosed with haloxyfop for 28 days at 2.5 ppm of diet, the concentration in milk reached a maximum of 0.04 mg/kg at day 20.

Beef cattle were dosed with haloxyfop-R at a rate equivalent to 0, 10, 20 or 30 ppm of diet for 28 days. Low concentrations of residue were detected in kidney and renal fat in the control group. The concentrations in animals at the highest dietary rate on day 28 were highest in the kidney (1.8 mg/kg at 30 ppm) and liver (0.46 mg/kg at 30 ppm). The mean concentrations in muscle did not exceed 0.06 mg/kg in any group, and the highest levels in abdominal, renal and subcutaneous fat were similar in

all groups: 0.05, 0.04 and 0.03 mg/kg, respectively. Residues were detectable 28 days after cessation of dosing in all tissues except muscle. The concentrations did not appear to be strongly correlated to dietary rate, those in animals at 20 and 30 ppm being similar.

The 1995 Meeting noted that haloxyfop-S undergoes rapid and nearly complete inversion to haloxyfop-R. In rats dosed with haloxyfop, nearly all of the residue recovered from urine and faeces was in the form of haloxyfop-R. The current Meeting therefore considered that the new studies in cattle dosed with haloxyfop-R could be used in estimating maximum residue levels, STMR values and highest residues in cattle tissues and milk.

Dietary burden of farm animals

The 1996 Meeting calculated that the intake by cattle was 17 ppm in the diet, on the basis of the highest residue in pasture of 3.35 mg/kg and 80% moisture content. This was higher than the maximum concentration of 10 ppm used in the studies available to the Meeting. However, the 1997 and 1998 Meetings elaborated principles for estimating maximum residue levels and STMR values for commodities of animal origin, and the 1997 JMPR distinguished situations in which the plateau was reached rapidly and those in which it was reached slowly. It recommended that the MRLs of feed items should be used to calculate the dietary burden of animals for estimating maximum residue levels if the plateau was reached rapidly, while STMR values should be used if the plateau was reached slowly. For estimating STMR values, it recommended that, in both cases, the STMR values of feed items should be used to calculate the dietary burden of animals.

The concentrations of residues of haloxyfop in milk reached a plateau on day 10 in the study provided to the current Meeting; they reached a maximum on day 20 in a study reviewed by the 1995 JMPR. The current Meeting agreed that the plateau concentration of haloxyfop residues in milk was reached slowly and re-estimated the dietary burden of cattle on the basis of the diets in Appendix IX of the *FAO Manual*. Calculation from STMRs provided feed concentrations suitable for estimating both maximum residue levels and STMRs for cattle commodities.

The 1995 JMPR estimated maximum residue levels of 0.01 mg/kg for chicken meat, 0.1 mg/kg for edible offal of chicken and 0.01 mg/kg (*) for chicken eggs. The 1996 JMPR re-calculated an intake of 0.035 ppm (dry weight basis) by poultry on the basis that feed could contain up to 50% pulses, 7% rape seed meal and 30% soya bean meal and using the STMR values of 0.03, 0.15 and 0.03 mg/kg for these three feed items, respectively. The current Meeting re-estimated the dietary burden of haloxyfop residues for poultry on the basis of the diets in Appendix IX of the *FAO Manual*. As no information was available on the time at which the concentrations reached a plateau in chicken, the maximum and STMR dietary burdens were calculated on the basis of the highest residue level or STMR-P value and STMR or STMR-P value, respectively.

Estimated dietary burden of cattle

Commodity	Group	STMR or STMR-P (mg/kg)	Dry matter (%)	Residue, dry weight (mg/kg)	Per cent of diet		Residue contribution (mg/kg)	
					Beef cattle	Dairy cows	Beef cattle	Dairy cows
Pasture	AF	1.59	25	6.36	30	40	1.9	2.5
Alfalfa forage (green)	AL	2.33	35	6.66	70	60	4.7	4.0
Fodder beet, leaves or tops	AV	0.04	23	0.17				
Sugar beet, leaves or tops	AV	0.04	23	0.17				
Pulses (field pea, dry)	VP	0.03	90	0.04				
Rape seed meal	SO	0.15	88	0.17				
Rice bran	CM	0.02	90	0.02				
Soya bean meal	VP	0.03	92	0.03				
				Total	100	100	6.6	6.5

Maximum dietary burden of poultry

Commodity	Group	MRL or STMR-P (mg/kg)	Dry matter (%)	Residue on dry basis (mg/kg)	Per cent of diet	Residue contribution (mg/kg)
Pulses (field pea, dry)	VD	0.2	90	0.22	20	0.044
Rape seed meal	SO	0.15	88	0.17	15	0.026
Rice bran	CM	0.02	90	0.02	25	0.006
Soya bean meal	VD	0.03	92	0.03	20	0.007
				Total	80	0.082

Dietary burden of poultry at STMR

Commodity	Group	STMR or STMR-P (mg/kg)	Dry matter (%)	Residue on dry basis (mg/kg)	Per cent of diet	Residue contribution (mg/kg)
Pulses (field pea, dry)	VD	0.03	90	0.04	20	0.008
Rape seed meal	SO	0.15	88	0.17	15	0.026
Rice bran	CM	0.02	90	0.02	25	0.006
Soya bean meal	VD	0.03	92	0.03	20	0.007
				Total	80	0.044

The dietary burden of haloxyfop for estimating the maximum residue levels and STMR values for cattle commodities (residue concentrations in animal feeds expressed as dry weight) was calculated to be 6.6 mg/kg for beef cattle and 6.5 mg/kg for dairy cows. The dietary burden for poultry commodities was calculated to be 0.082 mg/kg for estimating the maximum residue level and 0.044 mg/kg for the STMR.

A study in which cattle were fed a diet containing 10 ppm haloxyfop for 28 days was considered by the 1995 JMPR, and the current Meeting agreed to use the data from this study in estimating maximum residue levels and STMRs and highest residues for various tissues of cattle. The highest individual values in the group at 5 and 10 ppm were used in conjunction with the dietary burden at the STMR to calculate the probable highest concentration of residues in animal commodities. The mean concentrations in animal tissues at 5 and 10 ppm were used in conjunction with the dietary burden at the STMR to estimate the STMR values for animal commodities. For milk, the mean plateau concentration of residues in the group fed a diet containing 10 ppm haloxyfop-R was used to estimate both the STMR and the highest residue.

Feeding level (ppm) *Interpolated* / actual	Residues of haloxyfop (mg/kg)								
	Milk (mean)	Liver		Kidney		Muscle		Fat	
		High	Mean	High	Mean	High	Mean	High	Mean
MRL beef									
6.6 /		*0.33* /		*0.95* /		*0.03* /		0.23 /	
5		0.15		0.51		0.01		0.09	
10		0.72		1.90		0.06		0.53	
MRL dairy									
6.5 /	*0.22* /								
10	0.34								
STMR beef									
6.6 /			*0.28* /		*0.73* /		0.02 /		0.18 /
5			0.15		0.43		0.01		0.08
10			0.56		1.37		0.04		0.39
STMR dairy									
6.5 /	*0.22* /								
10	0.34								

The Meeting estimated a maximum residue level and STMR value in milk of 0.3 and 0.22 mg/kg; a maximum residue level, STMR value and highest residue in cattle liver of 0.5, 0.28 and 0.33 mg/kg; a maximum residue level, STMR value and highest residue in cattle kidney of 1, 0.73 and

0.95 mg/kg; and a maximum residue level, STMR value and highest residue in cattle meat of 0.05, 0.02 and 0.03 mg/kg, respectively.

The 1995 and 1996 JMPR considered a study in which laying hens were fed a diet containing 0.25–2.5 ppm haloxyfop for 28 days.

Feeding level (ppm) *Interpolated* / actual	Residues of haloxyfop (mg/kg)							
	Muscle and skin		Liver		Fat		Eggs	
	High	Mean	High	Mean	High	Mean	High	Mean
MRL	*< 0.003* /		*0.030* /		*0.010* /		*< 0.003* /	
0.082 / 0.25	< 0.01		0.09		0.03		< 0.01	
STMR		*< 0.002* /		*0.009* /		*0.004* /		*< 0.002* /
0.044 / 0.25		< 0.01		0.05		0.02		< 0.01

The Meeting estimated a maximum residue level, STMR value and highest residue in chicken meat (with adhering skin) of 0.01(*), 0.002 and 0.003 mg/kg; a maximum residue level, STMR value and HR value in chicken, edible offal of 0.05, 0.009 and 0.030 mg/kg; and a maximum residue level, STMR value and highest residue in chicken eggs of 0.01(*), 0.002 and 0.003 mg/kg, respectively.

Recommendations

On the basis of the data provided, the Meeting recommended the following values:

Definition of residue (for compliance with MRL and for estimation of dietary intake of commodities of plant and animal origin): haloxyfop esters, haloxyfop and its conjugates expressed as haloxyfop

Commodity		MRL (mg/kg)		STMR (mg/kg)	HR (mg/kg)
CCN	Name	New	Previous		
AL 1021	Alfalfa forage (green)	5[a]	W	2.33	–
MM 0812	Cattle meat	0.05	W	0.02	0.03
ML 0812	Cattle milk	0.3	W	0.22	–
MO 0812	Cattle, edible offal of	–	W	–	–
MO 1280	Cattle, kidney	1	–	0.73	0.95
MO 1281	Cattle, liver	0.5	–	0.28	0.33
PE 0840	Chicken eggs	0.01(*)	0.01 (*)	0.002	0.003
PM 0840	Chicken meat	0.01(*)[b]	0.01 (*)	0.002	0.003
PO 0840	Chicken, edible offal of	0.05	0.1	0.009	0.030
AV 1051	Fodder beet leaves or tops	0.3 [a]	W	0.03	–
AV 0596	Sugar beet leaves or tops	0.3 [a]	W	0.03	–

[a] Fresh weight basis
[b] With adhering skin

The information provided to the JMPR precluded an estimate that the dietary intake would be below the ADI in three regional diets.

Dietary risk assessment

Long-term intake

The Meeting estimated 10 STMR values for four commodities of cattle origin, three commodities of chicken origin and three fodder crops. These STMR values were used in combination with the STMR and STMR-P values estimated by the 1996 Meeting to calculate the long-term dietary intake of haloxyfop. The result is shown in Annex 3.

The IEDIs for the five GEMS/Food regional diets, on the basis of the estimated STMRs, were in 50–440% of the ADI. The Meeting concluded that long-term dietary intake of haloxyfop residues

from uses that have been considered by the JMPR might exceed the ADI in three GEMS/Food regional diets.

Short-term intake

The IESTI of haloxyfop by children and adults was calculated for commodities derived from cattle and chicken. The results are shown in Annex 4. The Meeting concluded that it might be necessary to establish an acute reference dose for haloxyfop. As one has yet been established, the acute risk assessment for haloxyfop was not finalized

REFERENCES

Anon., 1999a. Analysis of haloxyfop residues in bovine milk and tissue. Study report NCRL No. 9901.

Anon., 1999b. Magnitude of Haloxyfop-R in milk from 28-day cow feeding study. AHSC75424/98-426-E. Animal Health Services Centre, Massey University, New Zealand.

Anon., 1999c. Haloxyfop determination in liver, kidney, muscle, fat and milk: method validation. Study report NCRL No. 9902.

Anon., 1999d. Magnitude of Haloxyfop-R in tissue from a 28-day cow feeding study – animal phase. Study number 98-426E/AHSC – 75450.

FAO/WHO, 1996. Pesticide residues in food. Evaluations 1995. Part I – Residues. FAO Plant Production and Protection Paper 137.

Gardner, R.C., 1984. Residues of haloxyfop in milk and cream from cows fed haloxyfop (N152). The Dow Chemical Company GH-C1709. Unpublished.

Kutschinski, A.H. and Bjerke, E.L., 1984a. Residues in tissues from beef calves fed haloxyfop (N151). The Dow Chemical Company GH-C1680. Unpublished.

Kutschinski, A.H. and Bjerke, E.L., 1984b. Residues in tissues and eggs from chickens fed haloxyfop (N153). The Dow Chemical Company GH-C1680. Unpublished
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