

PIRIMIPHOS-METHYL (086)

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Pirimiphos-methyl was evaluated for residues at the 2003 JMPR within the Periodic Review Programme, when data on metabolism, analytical methods, storage stability, supervised field trials, processing studies and farm animal feeding trials were reported. As no data were reported on the storage stability in animal tissues or eggs, the 2003 JMPR concluded that it could not exclude the possibility that the low or negligible levels of pirimiphos-methyl and metabolites found in the studies were due to the unstable nature of these compounds during storage of the samples. Furthermore, the JMPR recommended withdrawal of the CXLs for eggs and meat (from mammals other than marine mammals).

Pirimiphos-methyl was found to be stable in milk for two months when stored at -14°C and the JMPR estimated a maximum residue level of 0.01 mg/kg and an STMR of 0.003 mg/kg for milk. The Meeting considered further work or information on storage stability of pirimiphos-methyl and metabolites in animal tissues and eggs and pirimiphos-methyl concentrations in fat in animal feeding studies was desirable. Data on the storage stability of pirimiphos-methyl in animal tissues, milk and eggs were reported to the present Meeting.

Analytical methods

The analytical method used in the study involved extraction with 8:2 hexane:acetone, silica SPE clean-up and quantification by GC/MS. Fat extracts were subject to a hexane/acetonitrile partition before the SPE procedure. The method was validated at 0.01 mg/kg level for all samples. Average procedural recovery at the 0.5 mg/kg fortification level in the samples ranged from 75-109% with a maximum RSD of 15.9% (n=3). This extraction method differs from the one reported to the 2003 Meeting, which involved extraction of tissue samples with methanol/2N HCl (1:1), of milk samples with methanol/concentrated HCl/hexane, and of egg with methanol/2N HCl (9:1) to remove protein.

Stability of residues in stored analytical samples

A study to determine the stability of pirimiphos-methyl residues at 0.5 mg/kg level in beef muscle, liver, kidney, fat, milk and hens' eggs, after storage at <-18 °C for up to 12 months, was reported (Stevenson, 2003). For each matrix, one blank and three fortified samples were analysed. No analysis was performed at 0 day (Table 1).

Table 1. Stability of pirimiphos-methyl in animal products fortified with 0.5 mg/kg and stored at <-18 °C.

Sample	Sampling time	Residues, mg/kg	% residues remaining (assuming 0.5 mg/kg at 0 day)
Beef muscle	3 months ^a	0.45	90
	6 months	0.53	105
	12 months	0.39	78
Liver	3 months ^b	0.33	66
	6 months	0.45	89
	12 months	0.45	90
Kidney	3 months ^c	0.42	83
	6 months	0.44	88
	12 months	0.40	80
Fat	3 months ¹	0.34	67
	6 months	0.36	72
	12 months	0.37	73
Milk	3 months ²	0.47	93

Sample	Sampling time	Residues, mg/kg	% residues remaining (assuming 0.5 mg/kg at 0 day)
Hens' eggs	6 months	0.49	98
	12 months	0.50	100
	3 months ³	0.46	92
	6 months	0.52	104
	12 months	0.44	88

¹ corrected for an apparent untreated residue of 0.0035 mg/kg, not corrected for a reagent blank

² corrected for untreated residue of 0.0174 mg/kg, not corrected for a reagent blank

³ corrected for untreated residue of 0.0108 mg/kg, not corrected for a reagent blank

APPRAISAL

Pirimiphos-methyl was evaluated for residues by the 2003 JMPR within the CCPR Periodic Review Programme. As no data were reported on the storage stability in animal tissues or eggs, the JMPR recommended withdrawal of the CXLs for eggs and meat (from mammals other than marine mammals). Data on the storage stability of pirimiphos-methyl in animal tissues, milk and eggs were provided to the present Meeting.

Stability of residues in stored analytical samples

Pirimiphos-methyl residues at 0.5 mg/kg were shown to be stable for up to 12 months in beef muscle, liver, kidney, fat and milk and hens' eggs stored below -18°C .

Residues in animal commodities

The 2003 JMPR calculated the dietary burden of pirimiphos-methyl for estimated MRLs and STMR values for animal commodities as 6.4 and 2.1 mg/kg for beef cattle, 5.6 and 2.9 mg/kg for dairy cattle and 6.3 and 2.1 mg/kg for poultry respectively. In one study submitted to the 2003 Meeting, the residue levels were below the LOQ (0.01 mg/kg) in heart, liver, kidney, fat and pectoral muscle from cows fed diets containing 0, 5, 15 or 50 ppm (dry weight basis) of pirimiphos-methyl for 30 days. Adductor muscle from one of three cows at the highest feeding level contained detectable residues (0.02 mg/kg). In another study submitted to the previous Meeting, eggs from hens receiving 32 ppm pirimiphos-methyl for 7 days contained residues at a maximum of 0.01 mg/kg. No detectable residues were found in leg or breast muscle.

Maximum residue levels

The Meeting agreed that it was unlikely that pirimiphos-methyl residues would remain in tissues of cows fed commodities treated with the insecticide, and estimated a maximum residue level of 0.01* mg/kg and STMR and highest residue values of 0 mg/kg for pirimiphos-methyl in edible offal (mammalian) and meat (fat) from mammals other than marine mammals. For calculating dietary intake, the Meeting also recommended an STMR and a highest residue level of 0 mg/kg for pirimiphos-methyl in muscle and fat from mammals other than marine mammals.

The Meeting agreed that it was unlikely that pirimiphos-methyl residues would remain in the tissues of poultry or birds fed commodities treated with the insecticide, and recommended a maximum residue level of 0.01* mg/kg and STMR and highest residue values of 0 mg/kg for pirimiphos-methyl in poultry meat and poultry edible offal. For estimating dietary intake, the Meeting also recommended STMR and highest residue values of 0 for pirimiphos-methyl in poultry muscle and fat.

Pirimiphos-methyl was detected in eggs of hens at the high feeding level, which corresponded to five times the dietary burden of poultry for maximum residue estimation. The Meeting estimated maximum and highest residue levels of 0.01 mg/kg for pirimiphos-methyl in eggs. As the dietary

burden from the STMR corresponds to 15 times the feeding level, the Meeting agreed to recommend an STMR of 0 mg/kg for eggs.

RECOMMENDATIONS

On the basis of the data from animal studies, the Meeting concluded that the residue levels shown below are suitable for establishing maximum residue limits and for dietary intake assessment.

Definition of the residue for compliance with MRLs and for estimation of dietary intake in plant and animal commodities: pirimiphos-methyl. The compound is fat-soluble.

Commodity		MRL, mg/kg		STMR or STMR-P	HR or HR-P,
CCN	Name	New	Previous	mg/kg	mg/kg
MOO 105	Edible offal (mammalian)	0.01*		0	0
PE 0112	Eggs	0.01	0.05*	0	0.01
MM 0095	Meat (from mammals other than marine mammals)	0.01* fat ¹	0.05*	Muscle: 0 Fat: 0	Muscle: 0 Fat: 0
PM 0110	Poultry meat	0.01*		Muscle: 0 Fat: 0	Muscle: 0 Fat: 0
PM 0111	Poultry, Edible offal of	0.01*		0	0

¹ No residues expected from consumption of feed commodities with pirimiphos-methyl residues, as evaluated by the JMPR.

DIETARY RISK ASSESSMENT

Long-term intake

The Meeting agreed that the STMR of 0 mg/kg estimated by the present Meeting for pirimiphos methyl in animal commodities would not affect the IEDIs calculated by the 2003 JMPR, which concluded that the long-term intake of residues of pirimiphos methyl would be unlikely to present a public health concern.

Short-term intake

The IESTIs of pirimiphos-methyl by the general population and by children were calculated for commodities for which highest residue levels were estimated by the current Meeting (Annex 4 of the Report). For all the commodities, the IESTI was 0–0.08 µg/kg bw. Although it might be necessary, no ARfD has yet been established for pirimiphos methyl, and the short-term risk assessment could not be finalized.

REFERENCES

FAO (2004), *Pesticide residues in food*. 2003 Report of the Joint Meeting of the FAO Panel of Experts on Pesticide Residues in Food and the Environment and the WHO Expert Group on Pesticide Residues. FAO Plant Production and Protection Paper Food and Agriculture Organization. Rome.

Stephenson C (2003). Pirimiphos-methyl stability in animal matrices following frozen storage for up to 12 months', Agrisearch UK Ltd, Unpublished Report No. AD/6831/AY, Syngenta File No. PP511/0834