METRACRIFOS (125)

EXPLANATION

Methacrifos has been evaluated several times by the JMPR, first in 1980 when a temporary ADI of 0.0003 mg/kg bw was allocated. Taking into account new toxicological data the 1988 JMPR increased the temporary ADI to 0.003 mg/kg bw. The 1990 Meeting allocated an ADI of 0.006 mg/kg bw.

Residues from supervised trials were evaluated in 1980 and maximum residue levels for several commodities were estimated. The 1990 JMPR re-evaluated GAP data.

Concerns have been expressed at the CCPR on several occasions regarding the persistence of the residue after processing.

At the 1992 CCPR it was noted that animal transfer studies were needed for animals other than poultry in order that MRLs might be considered by the JMPR. Results of a feeding study on beef cattle following the consumption of wheat treated with methacrifos were submitted by the producer of the compound.

Information on use patterns for stored cereal grains and milling/processing studies on cereals were submitted from Australia and the United Kingdom.

FATE OF RESIDUES

In animals

Beef cattle were given food prepared from wheat grain containing methacrifos at a level of 15 or 30 ppm and fat and tissues were examined for the presence of the parent compound and its dealkylated metabolite.

The medicated feed, consisting of 5 parts wheat to 2 parts chaff, was made available to the cattle ad lib for a maximum period of 14 days. Some calves were killed after 7 days' exposure, some after 14 and a third group were given a recovery period of 7 days on non-medicated feed after the 14-day exposure period before they were killed.

Neither methacrifos nor its dealkylated metabolite could be detected in the fat, liver, kidney or muscle of cattle exposed to medicated feed. The limit of detection was 0.01 mg/kg in all substrates.

In storage and processing

Australian information submitted to the Meeting confirmed that an application rate of 10 g/t is necessary to control the full range of insect pests in Australia in long-term storage. Table 1 shows the results of trials in Australia in 1991.

Table 1. Methacrifos residues in wheat, milling fractions and processed commodities in Australia, 1991

Application rate (g ai/t)	10		20		
Time after application (weeks) 6	6	20	6	20	
	Residue(mg/kg)				Ratio to wheat residue
Wheat	4.9	3.7	14.8	13.5	-
Bran	17.6	15.4	46.7	46.8	3.4
Germ	19.4	14.8	57.9	50.0	3.7
Flour	1.4	1.5	4.4	4.3	0.31
					Mean % surviving baking'
Flour for baking	0.8	1.3	4.2	3.3	
90:10 wholemeal	2.9	3.5	13.3	10.0	
White bread	0.3	0.6	0.7	1.5	55
Wholemeal bread	1.0	1.3	4.0	4.0	so
Flat bread	2.1	1.9	6.6	5.4	65
Steamed bread	0.4	0.5	0.8	1.4	43
Yellow noodle	0.3	0.3	1.1	1.1	25
White noodle	0.8	1.0	2.6	2.7	60

1 Adjusted for differences in moisture content

The application rate for stored cereals in the United Kingdom is reported to be 4.75 g/t. The period of protection is then up to 5 months. Results of residue studies are summarized in Table 2.

Table 2. Pesticide residues (mg/kg) in wholemeal flour and bread produced from treated wheat (expressed on whole product basis)

Applied dose (g/t)	Weeks stored	Residues, mg/kg			% pesticide surviving baking
		Aged wheat	Flour	Bread	
2.6	24	1.4	1.3	0.51	39

On the basis of the new data and the data evaluated previously the Meeting proposed that the established MRLs for cereals grains, unprocesssed wheat bran, wheat flour and wheat wholemeal should not be changed. Because methacrifos can in some circumstances (e.g. in temperate climates) be quite stable, MRLs should also be based on the approved rate of application.

APPRAISAL

Concern has been expressed at the CCPR on several occasions regarding the persistence of methacrifos residues on cereal grains after processing.

Information on the use patterns for stored cereal grains and milling/processing studies on cereals were submitted from Australia and the UK.

At the 1992 CCPR it was noted that animal transfer studies were needed for meats other than poultry in order that MRLs might be recommended by the JMPR. Results of a study on beef cattle fed with wheat treated with methacrifos were submitted by the producer of the compound.

Australian information submitted to the Meeting explained that to control the full range of insect pests in Australia in long-term storage an application rate of 10 g/t was necessary. The application rate for stored cereals in the UK is reported to be 4.75 g/t. The period of protection is about 5 months.

On the basis of the new and previously evaluated data the Meeting proposed not to change the established MRLs for cereal grains, wheat bran, unprocessed, wheat flour and wheat wholemeal. Because methacrifos can be quite stable in some circumstances (e.g. in temperate climates), MRLs should also be based on the approved rate of application.

Beef cattle were given feed prepared from wheat grain containing methacrifos at a level of 15 or 30 ppm and the parent compound and its dealkylated metabolite were determined in the fat and tissues. The treated feed, consisting of 5 parts of wheat to 2 parts of chaff, was made available to the cattle ad lib for a maximum period of 14 days. Some calves were killed after 7 days, some after 14 days, and some were allowed a recovery period of 7 days on untreated feed after the 14-day exposure period before slaughter. Neither methacrifos nor its dealkylated metabolite could be detected in the fat, liver, kidney or muscle. The limit of determination was 0.01 mg/kg in all substrates.

No additional information on GAP and no residue data were submitted for the other commodities held at step 7B of the CCPR procedure (Beans (dry), Cacao beans, Field pea (dry), Peanut, Peanut, whole, Eggs, Milks, and Poultry meat).

RECOMMENDATIONS

On the basis of the data from a feeding study on beef cattle the Meeting concluded that the residue levels listed below are suitable for use as MRLs.

Definition of the residue: methacrifos (fat-soluble)

Commodity		Recommended MRL (mg/kg)	
CCN	Name	New	Previous
MO 0812	Cattle, Edible offal of	0.01*	-
MM 0812	Cattle meat	0.01* (fat)	-

REFERENCES

Webley, D. 1992. Methacrifos Residues in wheat and milled products after commercial treatment, milling and baking. Report No. AGT/92/R/2.

Ministry of Agriculture, Fisheries and Food (MAFF), 1991. Review paper on the use of grain protectants in the UK.

Bull, M.S. 1983. The uptake of residues of CGA-20168 and its dealkylated metabolite C64-90953 in the fat and tissues of beef cattle following consumption of wheat treated with methacrifos. Technical Report Ciba-Geigy 83/12/976.