

ABAMECTIN

**First draft prepared by
Dr. J. Boisseau
National Agency for
Veterinary Medicinal Products
Fougères, France**

ADDENDUM

**to the Abamectin residue monograph prepared by
the 45th meeting of the Committee and published in
FAO Food and Nutrition Paper 41/8, Rome 1996**

Abamectin is an agricultural compound approved as a plant protection agent which is used also as a veterinary drug for control of endo- and ectoparasites. The compound was evaluated as a pesticide by JMPR in 1992 and again in 1994 where an ADI of 0-0.2 µg per kg body weight was established. This ADI was based on a no-observed adverse effect level of 0.12 mg/kg of body weight using a safety factor of 500 because of concern about the teratogenicity of the Δ-8,9 isomer identified as an abamectin photodegradation product found in plant products.

Abamectin was on the agenda for the 45th JECFA in 1995 for evaluation of its use as a veterinary drug, intending to rely on the toxicological evaluation performed by the 1994 JMPR Meeting. On reviewing the data related to the use(s) of abamectin, the 45th JECFA concluded that the Δ-8,9 isomer is not present in animal tissues when abamectin is used as a veterinary drug. Therefore, the 45th meeting of JECFA recommended that consultations be held as soon as possible by JMPR and JECFA to resolve this problem. A joint JECFA/JMPR ad-hoc meeting was held in Geneva in September 1995 on this issue. The ad-hoc meeting recognized that consideration be given for a different ADI for abamectin as a pesticide and as a veterinary drug. As a consequence the JMPR meeting held in September 1995 agreed that the ADI of 0-0.2 µg/kg bw was not appropriate for abamectin residues in animal derived food that do not contain the Δ-8,9 isomer. In order to accommodate this situation, this JMPR meeting allocated an ADI of 0-1 µg/kg of body weight to abamectin on the basis of the NOEL of 0.12 mg/kg bw per day in the study of reproductive toxicity in rats and using a safety factor of 100 for veterinary drug use.

The JMPR meeting emphasized that MRLs that are recommended by JMPR and JECFA should be harmonized to include residues from the use of abamectin as a veterinary drug and the consumption by animals of fodder containing residues of abamectin.

The MRLs recommended by JMPR concerning cattle are the following

- muscle: 0.01 mg/kg
- liver, kidney: 0.05 mg/kg

Considering that:

- the ADI of 0-1 µg/kg bw established by JMPR results in a maximum allowable intake of residues of 0-60 µg for a 60 kg person
- Abamectin used as a veterinary drug is only intended for use in beef cattle
- Avermectin B_{1a} is considered as the appropriate marker residue
- Liver and fat are considered as the appropriate target tissues
- Abamectin does not lead to bound residues in fat tissues and that bound residues account for less than 15% in liver
- Avermectin B_{1a} accounts for 42% of the total residues in liver, 25% in fat tissue and 50% in kidney at 21 days post dosing

- There is an analytical method available

The committee recommended the following values for MRLs in cattle which, for abamectin used as veterinary drug, are expressed as avermectin B_{1a}:

- fat, liver: 100 µg/kg
- kidney: 50 µg/kg

As abamectin is only intended for beef cattle, there is no need for an MRL in bovine milk. Recognizing that liver, kidney and fat are the only tissues appropriate for monitoring residues of abamectin in animal tissues, there is no need for an MRL in bovine muscle where residues deplete to non-detectable concentrations at the recommended withdrawal time. Nevertheless, the JECFA recognized that JMPR has established MRL's for abamectin used as pesticide that are suitable for residues in cattle muscle and milk.

These MRLs result in a theoretical maximum daily intake of total residues of abamectin of 49 µg which, considering the total intake of 60 µg, gives an acceptable margin of safety for the possible additional ingestion of residues from pesticide use by consumption of fruits and vegetables and from the consumption of meat from cattle ingesting some contaminated fodder.

Tissue	MRL (µg/kg)	Factor TR/B _{1a}	TR (µg/kg)	Daily Food Intake (g)	Residues Consumed (µg B _{1a} eq)
Liver	100	100/42	238	100	24
Kidney	50	100/50	100	50	5
Fat	100	100/25	400	50	20
				Total	49

REFERENCE

Joint FAO/WHO Meeting on Pesticide Residues (JMPR): FAO Plant Production and Protection Paper 133, 1996