UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, D.C. 20460

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OFFICE OF
PESTICIDES AND TOXIC SUBSTANCES

MEMORANDUM

SUBJECT: PP#8F3592/FAP#8H5550 - Avermectin B_1 (Abamectin) on Citrus - Anticipated Residues of Avermectin in Citrus Juice and Milk - Chronic Exposure

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To estimate the anticipated residues in citrus juice and milk (the latter from feeding residues in cottonseed and dried citrus pulp), the residue and processing data evaluated by M. Kovacs in a memo of April 25, 1988 are employed. These data are summarized as follows:

I. RAC Data: (Proposed use of 0.025 lbs ai/A, 3 applications and 7 days PHI)

Sample analyses	ppm each
17	[1]ND (<0.002)
3	[2]NQ (0.002 - 0.005)
1	0.010
1	0.011
2	0.008*
2	0.012*
26	0.084 = sum of residues from all samples

= 0.003 ppm, average residue of AVM-B_{1a} in citrus rac

[1]ND used at 0.001 X 17 = 0.017 ppm
[2]NQ used at 0.002 X 3 = 0.006 ppm
*Are taken from 1 or 2 applications, 7 day PHI because they are finite values

[These data are from Document No. 4, 5/27/87, (MRID-404430-04), Tables 1-9.]

For assessing direct human exposure to avermectin (i.e., citrus juice) we recommend that the maximum observed residue of 0.012 ppm be used as the whole fruit residue. To calculate the dietary burden for cattle (via dried citrus pulp) the average residue of 0.003 ppm is appropriate.

II. The actual concentration factor for dried pulp for oranges and tangerines was 3.6 and 4, respectively, with no concentration (1X) into grapefruit pulp. So a factor of 4 will be applied to citrus pulp for determining anticipated residues in feed for cattle:

4 X 0.003 ppm = 0.012 ppm residues of AVM-B_1 in dried citrus pulp.

[The concentration factor is taken from Document No. 6, Vol. 1 & 2, 6/26/87, MRID No. 404430-06 & -07.]

III. The residues in juice were determined by a fractionation study reported in PP#5G3287 and evaluated by L. Cheng (12/19/85 memo, page 17):

(1) Oranges: Juice = <0.001 ppm
Dried peel = 0.008 ppm
Whole fruit = 0.008 ÷ 5 = 0.002 ppm
Concentration factor whole fruit/juice = 0.5X

(2) Tangerine: Juice = <0.001 ppm
Dried peel = 0.011 ppm
Whole fruit = 0.011 ÷ 5 =0.002 ppm
Concentration factor, whole fruit/ juice = 0.5X

(3) Grapefruit: Juice = <0.001 ppm
Dried peel = 0.006 ppm
Whole fruit = 0.006 ÷ 5 = 0.001 ppm
Concentration factor, whole fruit/ juice = 1X

A concentration factor for whole fruit to juice = 0.5X

IV. Anticipated Residues in Cottonseed:

No detectable residues were found in cottonseed (<0.002 ppm), meal (<0.002 ppm) and hulls (<0.002 ppm). Therefore, a residue concentration of 0.001 ppm (one half the detection limit) will be used as cottonseed contribution to the cattle diet.

V. Dietary Burden

(1) Citrus juice:

0.012 ppm = residue in whole fruit
0.5X = concentration factor for juice
0.006 ppm = **ANTICIPATED RESIDUE OF AVM-B_1 IN CITRUS JUICE**

(2) Milk:

All cottonseed contributions to cattle diet is at 0.001 ppm of AVM-B_1 residues.

Citrus pulp contribution to the cattle diet is at 0.012 ppm AVM-B_1 residues.

Therefore, using a hypothetical dairy cattle diet:

Ingredients	% in Diet	AVM Residues (ppm)	Maximum Residues Feed (ppm)
Cottonseed	20	0.001	0.0002
meal	15	0.001	0.00015
hulls	5	0.001	0.00005
Dried citrus pulp	33	0.012	0.004
Corn	27	-	-
		Total	0.00440

Rounding to the significant 3rd decimal place = 0.004 ppm of AVM-B_1 residues anticipated in feed.

The feeding study used in the F. Boyd memo of 6/21/89 resulted in no detectable residues in milk over 28 days from feeding 10 ppb (the lowest dosage level) to dairy cows. Therefore, a residue in milk of <0.001 ppm would result from feeding 4 ppb (0.004 ppm) of AVM-B_1.

WE RECOMMEND THAT 0.001 PPM BE USED AS THE ANTICIPATED RESIDUE IN MILK.

cc: PP#6F3453, TOX/E. Budd/W. Dykstra, R.F., Circu., Reviewer, D. Edwards

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