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OFFICE OF
PESTICIDES AND TOXIC SUBSTANCES

MEMORANDUM:

SUBJECT: Residues of Chlorpyrifos per se in Meat and Milk as a Result of Ingestion of Treated Feed Items

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At the Post Phase II meeting for the Chlorpyrifos Second Round Review Registration Standard, held 3/16/89, DEB was asked to provide data to the TAS Staff [SACB] regarding maximum expected residues in meat and milk if the currently registered direct animal uses were cancelled. Therefore, this memo provides an estimation of maximum residues that will occur in meat and milk solely following ingestion of feed items treated with chlorpyrifos.

In the most recent Tolerance Assessment System (TAS) analysis for chlorpyrifos, the anticipated residue contribution (ARC) for the overall U.S. population was estimated to be 141% of the PADI, and for non-nursing infants and children (age 1 to 6), 200% and 273% of the PADI, respectively. Estimated exposure to red meat and milk represents at least 85-90% of the total exposure to chlorpyrifos (12/29/88 memo from S. Stanton [HED/SACB] to Charles Kent [SRRD/RB] and Dennis Edwards [RD/IRB]).

The previously calculated exposure to residues of chlorpyrifos in meat and milk was based on the currently established tolerances of 2 ppm for fat, meat and meat byproducts; 0.5 ppm for milk fat; and 0.02 ppm for whole milk. These tolerances include the metabolite, TCP, which is no longer considered to be of toxicological concern and reflect maximum expected residues following both ingestion of feed items and direct treatment of cattle. In a recent addendum to the residue chemistry chapter of

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the SRR, it was determined that TCP should be dropped from the tolerance expression so that tolerances cover only residues of the parent, chlorpyrifos per se (D. Edwards, 1/13/89). However, no specific recommendation was made regarding an acceptable tolerance level for meat and milk due to the presence of outstanding data gaps for direct animal treatment (refer to the 1/13/89 addendum for details). No outstanding data gaps exist for feeding studies. Therefore, DEB would be able to recommend the following tolerance levels to cover residues of chlorpyrifos per se in meat and milk, should the direct treatment uses drop out.

cattle fat	0.2 ppm
cattle meat and meat byproducts	0.05 ppm
milk fat	0.25 ppm
whole milk	0.01 ppm

The values for fat, meat, and meat byproducts were derived from the cattle feeding study discussed in the residue chemistry chapter (dated 2/29/84) of the initial registration standard for chlorpyrifos. Cattle fed chlorpyrifos at 3, 10, 30, and 100 ppm in the diet (three animals per dose level), were slaughtered at the end of a 30-day feeding period. Maximum reported residues of chlorpyrifos per se were as follows:

	dose level (ppm)			
	3	10	30	100
fat	0.05	0.16	1.09	4.70
muscle, liver, and kidney	0.01	0.03	0.02	0.34

Based on a diet consisting of 50% alfalfa meal and hay, 10% dehydrated apple pomace, and 40% soybeans and soybean meal, the maximum expected level of chlorpyrifos in the diet of beef cattle is 8 ppm. Therefore, following ingestion of feed items, residues in fat would not be expected to exceed 0.2 ppm and in meat and meat byproducts, 0.05 ppm.

The values for milk and milk fat were obtained from a 9/3/83 review by Karl Arne (DEB) contained in the correspondence file for PP#3F2884. This petition proposed that tolerances for residues in milk and milk fat, as well as for other commodities, be revised such that maximum permissible levels of chlorpyrifos per se would be specified. The proposed tolerances maintained the current level for combined residues of chlorpyrifos and TCP, but separately specified maximum levels of 0.25 ppm chlorpyrifos in milk fat and 0.01 ppm in whole milk. These tolerance proposals were based solely on ingestion of feed items containing

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chlorpyrifos and TCP, and not on the direct treatment of wounds permitted with the 2.5% PrL formulation. Dr. Arne, in his review, stated that these proposed tolerance levels for chlorpyrifos in milk and milk fat would be adequate to cover residues expected to occur following ingestion of treated feed items bearing combined residues of chlorpyrifos and TCP at approximately 15 ppm. Based on a diet consisting of 80% alfalfa meal or hay and 20% dehydrated apple pomace, the current maximum expected residue level of chlorpyrifos in the diet of dairy cattle is 13 ppm. Thus, Dr. Arne's conclusions are still valid. Following ingestion of treated feed items, residues in milk would not be expected to exceed 0.01 ppm and in milk fat, 0.25 ppm.

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cc:RF, Circ., Edwards, Reg. Standard File (SRR), PMSD/ISB, -
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