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PESTICIDES AND TOXIC SUBSTANCES

MEMORANDUM

SUBJECT: Captan - Dietary Exposure Assessment. No RCB Number.
MRID Numbers Used Noted in Body of Review.

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The Captan Task Force has submitted metabolism and residue chemistry data in response to the Data Call-In (DCI) Notice for Captan and its metabolites dated April 29, 1985. Residue reduction data have also been submitted (April 25, 1986). Preexisting residue data will be combined with the newly submitted data and monitoring data from the FDA for the purpose of assessing dietary exposure. Our detailed review of the new studies and methods will be discussed in a following memorandum which will address the concerns of the Registration Standard.

In this memorandum, we will summarize the crops that will be retained by the task force, the analytical methods used to gather the data, and the known and new metabolism data. We will provide residue estimates, by crop, for captan and THPI residues on the raw agricultural commodity and the commodity after processing, where such data are available. In most cases, average residues are representative of varying application rates and PHIs combined and averaged.

The Captan Task Force has not submitted residue data in support of avocados, beans, blackberries, blueberries, broccoli, Brussels sprouts, cabbage, carrots, cauliflower, collards, cottonseed, cranberries, dewberries, eggplant, garlic, kale, leeks, mangos, mustard greens, onions, peas, peppers, pineapples, pumpkins, raspberries, rhubarb, rutabagas, shallots, taro, turnips, and watermelons. Since no residue data are available for these crops, RCB recommends cancellation of these uses and revocation of the tolerances in our Registration Standard memorandum. Dietary exposures for these commodities have not been estimated.

While no data on celery, citrus (lemons, oranges, and grapefruit), lettuce, and summer squash were submitted by the task force in response to the DCI letter (April 29, 1985), studies were submitted in response to the residue reduction data section. These data were used in estimating dietary exposure for celery, citrus, lettuce, and summer squash.

Analytical Methods Used for New Data

The analytical method used to obtain the residue data on crops is the same as that used to produce the Residue Reduction Data, and is discussed in L.M. Bradley's review of July 22, 1986. The limit of detection for both captan and THPI is 0.05 ppm. Copies of the method are included in each volume. The analyses were performed by Morse Labs, with some apparently subcontracted to Hazleton Labs.

The storage stability study whose results support this procedure are discussed in the memorandum concerning Registration Standards. Recovery data are also discussed in that memorandum.

SSC Method RRC 86-62, "Gas Chromatographic Determination of Captan and Three Metabolites in Eggs and Tissues," was used for determination of captan and metabolite residues in eggs and tissues. Discussion of the method is included in the companion Registration Standard memorandum. The detection limit of the method is 0.02 ppm for THPI or 0.04 ppm for captan as THPI, 0.025 ppm for 3-OH THPI, 0.02 ppm for 5-OH(A) and 0.03 ppm for 5-OH(B) THPI.

Nature of the Residue

Plant Metabolism of Captan

Although the Registration Standard requires additional plant metabolism data (carbonyl label and trichloromethylthio label in both lettuce and potatoes with post-harvest treatments), we conclude that for the purpose of this dietary exposure assessment the residue of concern consists of captan and tetrahydrophthalimide, as should the tolerance expression.

The basis for this conclusion is that adequate metabolism studies are available for three crops, giving similar results, and side-chain metabolism studies for captafol (ethyl side chain) indicated no metabolites which require inclusion in

the residue definition. For the present purpose, we are relying on available information. The data requirements outlined in the Standard are unchanged. This dietary exposure assessment and the tolerance expression may have to be revised if additional metabolites of concern are identified.

Animal Metabolism of Captan

Although the Registration Standard requires some additional animal metabolism data (a carbonyl-labeled poultry study and trichloromethyl-labeled ruminant and poultry studies), we conclude that the residue of concern in poultry and livestock consists of tetrahydrophthalimide and its 3- and 5-hydroxy metabolites. The tolerance expression should be captan, tetrahydrophthalimide and 3- and 5-hydroxytetrahydrophthalimide.

The basis for this conclusion is that captafol poultry studies (using label in in both positions, see the February 10, 1987 Addendum to the Captafol Registration Standard) demonstrate the same metabolites as are found in ruminants (where captan metabolism has been adequately studied). We are relying on available data to reach a conclusion for the purposes of this review; the data requirements of the Standard are unchanged. This dietary exposure assessment and the tolerance expression for poultry and livestock may need to be revised if additional metabolites of concern are identified.

Seed Treatment Studies

Six seed treatment studies are submitted by the Captan Task Force: beets, corn, potatoes, rice, soybeans, and spinach. Additional studies on potato seed pieces and soybean seed treatments were submitted in PP#3F2898 and are included in this assessment. Most of the data are flawed and the deficiencies will be noted in the following memorandum responding to the Registration Standard. For dietary purposes, we are using zero residue since it is unlikely that any detectable residues will result from the seed treatment uses.

Residues in Meat, Milk, Poultry, and Eggs

The Registration Standard discusses two studies on dairy cattle submitted by Stauffer Chemical Company (MRID Nos. 00096910 and 00025125) which determined the residues of captan, THPI, 3-OH THPI and 5-OH THPI in milk and cream and cattle tissues. In study MRID No. 00096910, residues of captan were not found in any milk or cream, but residues of THPI, 3-OH THPI and 5-OH THPI were found.

Table 1. Maximum Milk Residues

<u>Metabolite</u>	<u>Nominal Dose Level, ppm</u>		
	<u>100</u>	<u>600</u>	<u>1200</u>
THPI	0.40	7.50	31.60
3-OH THPI	0.26	2.10	3.50
5-OH THPI	0.59	2.30	2.70

[From review of L.M. Bradley, November 15, 1985]

In study MRID No. 00025125, the following residues were found:

Table 2

Tissue	Captan Level	Day of Slaughter	Residue Found, ppm		
			Captan	THPI	3-OH THPI
F A T	100 ppm	21	0.00	0.03	0.01
		29	0.00	0.02-0.03	0.01-0.01
		32 (odd)	0.00	0.10-0.12	0.04
	600 ppm	21	0.00	0.93-1.0	0.06-0.09
		29	0.00	0.36-0.41	0.13
		32	0.00	0.01-0.02	0.00
	1200 ppm	21	0.00	3.9-4.0	0.09-0.14
		29	0.00	1.1	0.22-0.25
		32	0.00	0.01	0.00-0.01
H E A R T	100 ppm	21	0.00	0.11-0.12	0.02
		29	0.00	0.01	0.00
		32	0.00	0.00	0.00
	600 ppm	21	0.00	2.5-2.9	0.15-0.16
		29	0.00	0.65	0.01
		32	0.00	0.0	0.00
	1200 ppm	21	0.00-0.03	13	0.12-0.19
		29	0.00	2.8-3.1	0.11-0.04
		32	0.00	0.00	0.00
K I D N E Y	100 ppm	21	0.00	0.04	0.02
		29	0.00	0.01-0.02	0.00
		32	0.00	0.02-0.04	0.00
	600 ppm	21	0.00	1.6-2.0	0.04-0.06
		29	0.00	0.30-0.74	0.17-0.19
		32	0.00	0.01	0.00
	1200 ppm	21	0.00	6.6-8.4	0.06-0.29
		29	0.00	3.9-4.3	0.49-0.67
		32	0.00-0.01	0.01-0.02	0.00
L I V E R	100 ppm	21	0.00	0.04-0.07	0.00-0.01
		29	0.00	0.01	0.00
		32	0.00	0.01	0.00
	600 ppm	21	0.00	0.29-1.37	0.01-0.02
		29	0.00	0.84-0.86	0.05-0.06
		32	0.00	0.01	0.00
	1200 ppm	21	0.00	5.8-10.5	0.05
		29	0.00	2.9-3.2	0.24-0.30
		32	0.00	0.01-0.02	0.00
M U S C L E	100 ppm	21	0.00	0.08-0.09	0.01
		29	0.00	0.01	0.00
		32	0.00-0.01	0.01	0.00
	600 ppm	21	0.00	2.7-2.9	0.06
		29	0.00-0.01	0.78	0.04-0.05
		32	0.00	0.00	0.00
	1200 ppm	21	0.00	12	0.18-0.20
		29	0.00	3.2-3.8	0.26-0.32
		32	0.00	0.00	0.00

[From review of L.M. Bradley, November 15, 1985]

A new study is submitted by the Captan Task Force which measured residue concentrations of captan and its major metabolite, tetrahydrophthalimide (THPI) and minor metabolites, 3-hydroxytetrahydrophthalimide (3-OH THPI) and 5-hydroxytetrahydrophthalimide (5-OH THPI) in eggs and edible tissues of laying hens. One hundred hens divided into five groups were given oral doses of 0, 1.5, 15, 45, or 150 ppm captan daily for a 28-day period. The dosage levels were chosen by adding together the levels of captan which might be present in various feed commodities, based on percent of diet. Commodities chosen for these calculations were cottonseed, mustard, peas, soybeans, potatoes, pineapple, tomatoes, and grapes. After 28 days, ten hens from each of the five groups were sacrificed, followed by five more after a 3-day withdrawal period, and the final five from each dose group after a 7-day withdrawal period. Samples of liver, kidney, muscle, fat, heart, skin, and gizzard were collected and analyzed. Eggs were collected and analyzed the day before the study began, and on days 1, 4, 7, 10, 14, 21, 28, 32, and 35 thereafter.

Captan added to control samples was found to be quantitatively converted to THPI on contact with each tissue type and with eggs. Therefore, one portion of egg or tissue sample was fortified with captan; the sample was analyzed for THPI, and recoveries were calculated based on the conversion of captan to THPI. Other samples were fortified with THPI, 3-OH THPI, and 5-OH THPI.

Average recoveries for fortifications of control samples in eggs were as follows: 83 percent for 14 samples of captan fortification (recovery measured as THPI); 97 percent for 16 samples of THPI fortification, 70 percent for 17 samples of 3-OH THPI fortification, 83 percent for 17 samples of 5-OH THPI(A) fortification, and 82 percent for 17 samples of 5-OH THPI(B) fortification. The limit of detection is 0.02 ppm for THPI, 0.025 ppm for 3-OH THPI, 0.02 ppm for 5-OH THPI(A) and 0.03 for 5-OH THPI(B). (5-OH THPI occurs as two geometric isomers that elute separately during the gas chromatographic analysis.)

In the lowest dose group, THPI residue was found in the kidneys on the day of slaughter but no residues of any of the metabolites were found in any other tissues. No residues of any metabolites were found in any tissues or in eggs sampled 7 days after dosing was stopped. In samples taken 3 days after dosing was stopped, THPI residue was found in the kidney in the 150 ppm dose group and in eggs in the 15, 45, and 150 ppm dose groups. Residues were found in samples of all seven tissue types and in eggs taken on the day of sacrifice. See Table 3 for all residue levels identified on days 28 and 31 in tissues and eggs and Table 4 for maximum residues of captan metabolites in eggs and the day(s) on which they occurred.

Table 3

Tissue	Captan Fed ppm	Days after Cessation of Feeding	Residue Found, ppm			
			THPI	3-OH THPI	5-OH THPI	
					A	B
MUSCLE	1.5	0	< 0.02	< 0.025	< 0.02	< 0.03
		3	< 0.02	< 0.025	< 0.02	< 0.03
		7	< 0.02	< 0.025	< 0.02	< 0.03
	15	0	0.09	< 0.025	0.02	< 0.03
		3	< 0.02	< 0.025	< 0.02	< 0.03
		7	< 0.02	< 0.025	< 0.02	< 0.03
	45	0	0.23	0.58	0.03	< 0.03
		3	< 0.03	< 0.025	< 0.02	< 0.03
		7	< 0.03	< 0.025	< 0.02	< 0.03
	150	0	1.05	0.28	0.07	< 0.03
		3	< 0.02	< 0.025	< 0.02	< 0.03
		7	< 0.02	< 0.025	< 0.02	< 0.03
LIVER	1.5	0	< 0.02	< 0.025	< 0.02	< 0.03
		3	< 0.02	< 0.025	< 0.02	< 0.03
		7	< 0.02	< 0.025	< 0.02	< 0.03
	15	0	0.11	< 0.025	< 0.02	< 0.03
		3	< 0.02	< 0.025	< 0.02	< 0.03
		7	< 0.02	< 0.025	< 0.02	< 0.03
	45	0	0.25	0.038	< 0.02	< 0.03
		3	< 0.02	< 0.025	< 0.02	< 0.03
		7	< 0.02	< 0.025	< 0.02	< 0.03
	150	0	1.1	0.18	0.07	< 0.03
		3	< 0.02	< 0.025	< 0.02	< 0.03
		7	< 0.02	< 0.025	< 0.02	< 0.03
KIDNEY	1.5	0	0.03	< 0.025	< 0.02	< 0.03
		3	< 0.02	< 0.025	< 0.02	< 0.03
		7	< 0.02	< 0.025	< 0.02	< 0.03
	15	0	0.13	0.027	< 0.02	< 0.03
		3	< 0.02	< 0.025	< 0.02	< 0.03
		7	< 0.02	< 0.025	< 0.02	< 0.03
	45	0	0.32	0.049	0.03	< 0.03
		3	< 0.02	< 0.025	< 0.02	< 0.03
		7	< 0.02	< 0.025	< 0.02	< 0.03
	150	0	1.4	0.21	0.09	< 0.03
		3	0.02	< 0.025	< 0.02	< 0.03
		7	< 0.02	< 0.025	< 0.02	< 0.03
HEART	1.5	0	< 0.02	< 0.025	< 0.02	< 0.03
		3	< 0.02	< 0.025	< 0.02	< 0.03
		7	< 0.02	< 0.025	< 0.02	< 0.03
	15	0	0.12	< 0.025	< 0.02	< 0.03
		3	< 0.02	< 0.025	< 0.02	< 0.03
		7	< 0.02	< 0.025	< 0.02	< 0.03
	45	0	0.29	0.046	0.03	< 0.03
		3	< 0.02	< 0.025	< 0.02	< 0.03
		7	< 0.02	< 0.025	< 0.02	< 0.03
	150	0	0.68	0.13	0.05	0.03
		3	< 0.02	< 0.025	< 0.02	< 0.03
		7	< 0.02	< 0.025	< 0.02	< 0.03

Table 4

Tissue	Captan Fed ppm	Days after Cessation of Feeding	Residue Found, ppm			
			THPI	3-OH THPI	5-OH THPI	
					A	B
G I Z Z A R D	1.5	0	< 0.02	< 0.025	< 0.02	< 0.03
		3	< 0.02	< 0.025	< 0.02	< 0.03
		7	< 0.02	< 0.025	< 0.02	0.03
	15	0	0.08	< 0.025	< 0.02	< 0.03
		3	< 0.02	< 0.025	< 0.02	< 0.03
		7	< 0.02	< 0.025	< 0.02	< 0.03
	45	0	0.19	0.029	< 0.02	< 0.03
		3	< 0.02	< 0.025	< 0.02	< 0.03
		7	< 0.02	< 0.025	< 0.02	< 0.03
	150	0	0.93	0.11	0.03	< 0.03
		3	< 0.02	< 0.025	< 0.02	< 0.03
		7	< 0.02	< 0.025	< 0.02	< 0.03
F A T	1.5	0	< 0.02	< 0.025	< 0.02	< 0.03
		3	< 0.02	< 0.025	< 0.02	< 0.03
		7	< 0.02	< 0.025	< 0.02	< 0.03
	15	0	0.04	< 0.025	< 0.02	< 0.03
		3	< 0.02	< 0.025	< 0.02	< 0.03
		7	< 0.02	< 0.025	< 0.02	< 0.03
	45	0	0.10	< 0.025	< 0.02	< 0.03
		3	< 0.02	< 0.025	< 0.02	< 0.03
		7	< 0.02	< 0.025	< 0.02	< 0.03
	150	0	0.31	< 0.025	< 0.02	< 0.03
		3	< 0.02	< 0.025	< 0.02	< 0.03
		7	< 0.02	< 0.025	< 0.02	< 0.03
S K I N	1.5	0	< 0.02	< 0.025	< 0.02	< 0.03
		3	< 0.02	< 0.025	< 0.02	< 0.03
		7	< 0.02	< 0.025	< 0.02	< 0.03
	15	0	0.08	< 0.025	< 0.02	< 0.03
		3	< 0.02	< 0.025	< 0.02	< 0.03
		7	< 0.02	< 0.025	< 0.02	< 0.03
	45	0	0.20	0.035	< 0.02	< 0.03
		3	< 0.02	< 0.025	< 0.02	< 0.03
		7	< 0.02	< 0.025	< 0.02	< 0.03
	150	0	0.73	0.12	0.04	0.07
		3	0.02	< 0.025	< 0.02	< 0.03
		7	< 0.02	< 0.025	< 0.02	< 0.03
E G G S	1.5	0	< 0.02	< 0.025	< 0.02	< 0.03
		3	< 0.02	< 0.025	< 0.02	< 0.03
		7	< 0.02	< 0.025	< 0.02	< 0.03
	15	0	0.33-0.39	0.022-0.040	0.02	< 0.03
		3	0.02	< 0.025	< 0.02	< 0.03
		7	< 0.02	< 0.025	< 0.02	< 0.03
	45	0	0.62-1.2	0.095-0.13	0.04-0.08	0.03-0.05
		3	0.05-0.09	< 0.025	< 0.02	< 0.03
		7	< 0.02	< 0.025	< 0.02	< 0.03
	150	0	2.6-3.2	0.34-0.47	0.19-0.22	0.12-0.16
		3	0.18-0.29	0.025-0.033	0.02	< 0.03
		7	< 0.02	< 0.025	< 0.02	< 0.03

Table 5

Maximum Residues of Captan Metabolites in Eggs

<u>Captan-Fed ppm/day</u>	<u>THPI ppm on day no.</u>		<u>3-OH THPI ppm on day no.</u>		<u>5-OH THPI (A) ppm on-day no.</u>		<u>5-OH THPI (B) ppm on day no.</u>	
1.5	0.06	28	< 0.025	All	< 0.02	All	< 0.03	All
15	0.39	28	0.046	21	0.03	Several	0.03	Several
45	1.2	Several	0.18	14	0.10	14, 21	0.07	Several
150	3.4	21	0.65	21	0.34	21	0.28	21

Monitoring Data

Regarding the U.S. monitoring data which are mentioned in various places, we have relied on an FDA memorandum provided by Ellis Gunderson of the Division of Chemical Technology, FDA (from Jerry A. Burke, Director, Division of Chemical Technology, to the Director, Center for Food Safety and Applied Nutrition, dated July 11, 1985) which reports the number of positive findings, the number of samples, the residue range and the mean of all samples analyzed, by crop, for each year 1978 to 1984. While we have the actual printouts, we see no need to repeat the calculations, and so the monitoring data are presented in slightly different format than the field trial data. We included only domestic surveillance analyses (random sampling) done by the Luke procedure, which is the most reliable of the analytical methods used by FDA. These data are included in Attachment 1.

Dietary Exposure Calculations

The individual residue studies were tabulated, and the calculations performed, using Lotus 1-2-3 on a COMPAQ 286 personal computer. Studies not reflecting registered use patterns are not included in the calculations.

For the statistical calculations, all zero values were replaced with 0.03--approximating half the limit of detection (0.05 ppm). The printout has not been appended to this review, but is available in the RCB files. The average and variance functions of LOTUS were used, and the upper ninety-fifth confidence level was calculated using the formula below, provided by H. Lacayo of Toxicology Branch.

$$U95CL = \text{average} + t_{.05} * \frac{\text{variance}}{n}^{1/2}$$

n is number of data points.
t is Student's T for n-1 degrees of freedom.

Crops which are not supported by the Captan Task Force (no data submitted for the Standard) are not included in the dietary exposure calculations, since these uses will soon be eliminated as a result of the Registration Standard process. Our companion review recommends deleting those uses as soon as possible.

The summary table following tabulates the expected dietary levels for the unwashed and uncooked commodities from the registered use patterns, and incorporates the available residue reduction data and processing data. For example, apples as harvested contain an average of 3.8 ppm captan plus THPI. Washed apples would average 0.5 ppm (13% of 3.8 ppm), and cooked apples average 1.0 ppm (26% of 3.8 ppm).

We have underlined the values we believe should be used for TAS calculations. Where sufficient monitoring data were available, we have chosen the average of the positive finds. This value should be used without correction for percent crop treated. For those crops where no monitoring data exists or the data are very limited, we suggest using the average residue from field trials with the percent crop treated included in the calculation. (Data on the percentage of crops treated with captan represents estimates made by Benefits and Use Division and estimates provided by the major registrant, Chevron Chemical Company. See Attachment 2.)

Table 6

Commodity	Tolerances	Captan + THPI Average Residue	No. of Samples	U95CL	Monitoring Data	
					Max. Residue	Max year av. (pos)
Almonds nut	2	<u>0.1</u>	7	0.2	—	—
Apples	25	3.8	58	4.5	1.4	<u>0.21</u>
RAC		0.5	1			
washed		0.1	1			
peeled		1.0	1			
cooked		1.3	3			
juice		3.5	4			
dip only				4.5		
Apricots	50	5.0	24	6.1	5.1	<u>1.50</u>
Beets (S.T.)	2 100	0	1			
roots		<u>0</u>	1			
tops						
Cantaloupes	25	1.0	14	1.4	0.2	0.22
RAC		<u>0.1</u>	2			
peeled fruit					1.0	<u>0.61</u>
Celery	50					
Untrimmed		50.6	4			
washed		10.2	2			
washed & cooked		14.6	2			
Trimmed		33.9	4			
washed		9.9	2			
washed & cooked	7.8	2				
Cherries	100	12.4	47	14.3	16	<u>2.57</u>
all applic. dip contrib.		9.2				
Corn (S.T.) kernels	2	0				
Cucumbers	25	2.7	14	4.7	0.2	<u>0.16</u>
RAC		0.1	2			
washed		0	2			
peeled						
Grapes/Raisins	50				5.1	<u>3.38</u>
RAC		5.2	61	6.5		
washed		1.5	2			
juice		24.5	9			
raisins		22.9	11	37.3		

Table 7

Commodity	Tolerances	Captan + THPI Average Residue	No. of Samples	U95CL	Monitoring Data		
					Max. Residue	Max year- av. (pos)	
Grapefruit	25 (int)	3.4	2		--	--	
RAC		0.7	1				
washed		0.1	1				
pulp juice		<u>0</u>	2				
Lemons	25 (int)	6.3	4	9.0	--	--	
RAC		0.9	2	5.7			
washed		0.1	1				
pulp juice		<u>0.2</u>	1				
Lettuce	100	20.5	4	30.3	31	<u>3.53</u>	
RAC washed		8.3		50.5			
Nectarines	50	<u>3.6</u>	22	4.8	4.2	2.32	
RAC							
Oranges	25 (int)	1.1	8	1.9	--	--	
RAC		0.3	2				
washed		0.1	2				
pulp juice		<u>0</u>	1				
Peaches	50	27.3	39	41.7	8.8	<u>1.42</u>	
all appli. dip contrib.		85.7	29				7.3
foliar		5.9					
Pears	25	2.1	68	2.8	0.3	<u>0.22</u>	
all appli. dip contrib.		5.6	59				1.7
foliar (all)		1.3					
Plums/Prunes	50	<u>4.3</u>	49	5.2	--	--	
RAC prune		<u>5.8</u>	1				
Potatoes (S.T.)	25	<u>0</u>	4		--	--	
Rice (S.T.) grain	--	<u>0</u>	2		--	--	

Table 7 (Con'td)

Soybeans (S.T.) beans	2	<u>0</u>	2			
Spinach (S.T.) leaf	100	1.1	2		2.8	<u>2.34</u>
Squash, summer	25			1.6		
RAC		0.6	4			
washed		0.1	2			
peeled		0.02	2			
cooked		0.03	2			
Strawberries	25					
RAC		5.7	29	7.1	20	<u>5.16</u>
washed		1.2	3			
cooked		0.5	3			
Tomatoes	25				0.3	<u>0.31</u>
RAC		0.9	15	1.2		
puree		0.4	2			
juice		0.2	3			
ketchup		0.5	2			
Milk		0.1				
Animal tissue other than poultry	0.05	0.1				
Poultry tissue		0				
Eggs		0				

Potential feed items are almond hulls (28 ppm), apples (3.8 ppm) and dry apple pomace (22 ppm), beet tops (0.05 ppm), field corn grain (0.14 ppm) and fodder (0.28 ppm), grape dry pomace (13 ppm) and raisin waste (114 ppm), citrus byproducts (0-0.5 ppm), rice grain and straw (undetected), soybean forage and hay (undetected), and wet (0.2 ppm) and dry (2.5 ppm) tomato pomace. We have not used the 100 ppm level on detreated seed corn since this tolerance is due to be cancelled in the near future.

Based upon the above feed items, we calculated the dietary levels for dairy animals to be 7 ppm, beef animals to be 11 ppm and poultry to be 0.1 ppm. Using these values we calculate maximum likely levels for milk to be 0.1 ppm, tissues (other than poultry) to be 0.05 ppm, poultry tissues and eggs to be zero.

Attachments (2)

cc: R.F., Reg. Std. F., S.F., SIS (T. Levine), Reviewer, TAS
(K.Arne)
92286:I:Gray:C.Disk:KENCO:12/07/87:DD:VO:DD
RCB:TS-769:N.Gray:Edited by vg:CM#2:Rm810:X77484:12/10/87
RDI: A.Rathman, 12/3/87; R.Schmitt, 12/9/87

Attachment T

SUMMARY OF FDA MONITORING

Domestic Surveillance using Luke method

Commodity	positives	total #	percent positive	max residue	max yr avg (all)	max yr avg (pos)
Apples	151	907	16.6	1.4	0.030	0.207
Americots	34	93	38.7	5.1	1.200	1.500
Blackberries	5	20	25.0	1	0.150	0.525
Blueberries	1	27	3.7	0.001	0.001	0.027
Boysenberries	1	1	100.0	0.001	0.001	0.001
Broccoli	1	46	2.2	0.36	0.008	0.368
Cantaloupe	1	72	1.4	0.2	0.003	0.216
Carrots	4	113	3.5	0.41	0.010	0.283
Celery	4	232	1.7	1	0.013	0.605
Cherries	46	345	13.3	16	0.570	2.565
Cranberries	1	31	3.2	0.14	0.005	0.155
Cucumbers	2	183	1.1	0.2	0.002	0.158
Eggplant	1	34	2.9	0.001	0.001	0.034
Endive	1	47	2.1	18.6	0.400	18.800
Gooseberries	1	4	25.0	0.7	0.180	0.720
Grapes	31	279	11.1	5.1	0.370	3.375
Lettuce	89	2268	3.9	31	0.180	3.533
Loganberries	3	5	60.0	1.1	0.350	0.700
Nectarines	6	40	15.0	4.2	0.290	2.320
Peaches	89	531	16.8	8.8	0.230	1.417
Pears	8	229	3.5	0.3	0.020	0.220
Peppers	1	45	2.2	0.3	0.007	0.315
Raspberries	92	200	46.0	13.3	2.100	3.436
Spinach	8	230	3.5	2.8	0.130	2.340
Strawberries	341	686	49.7	20	3.400	5.155
Sweet Potatoes	1	49	2.0	0.01	0.000	0.001
Tomatoes	4	499	0.8	0.3	0.002	0.306



Attachment 2

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

OFFICE OF
PESTICIDES AND TOXIC SUBSTANCES

July 8, 1987

MEMORANDUM

SUBJECT: Extent of Crops Treated with Captan.

FROM: E. Neil Pelletier, Ph.D.
Science Support Branch
Benefits and Use Division (TS-768-C)

TO: Lynn Bradley, Chemist
Residue Chemistry Branch
Hazard Evaluation Division (TS-769-C)

The information in this response to the request for data on the percentage of crops treated with captan represents estimates made by BUD and estimates provided by the major registrant, Chevron Chemical Company. The percentages are for all captan usage including captan sources from registrants other than Chevron.

Estimated Percentages of Crops Treated with Captan

I. Foliage and/or Fruit Treatment

Almonds	59 ¹ / _—	Strawberries	82 ¹ / _—
Apples	34 ^I / _—	Cantaloupes	40
Apricots	61 ^I / _—	Carrots	30
Avocados	negligible ² / _—	Celery	30
Bushberries ³ / _—	32 ¹ / _—	Corn (sweet)	negligible ² / _—
Cherries	60	Collards	30
Cranberries	negligible ² / _—	Cucumbers	40
Citrus ⁴ / _—	negligible ² / _—	Eggplant	40
Grapes	45	Lettuce	30
Mango	40	Beets	20
Nectarines	61 ¹ / _—	Onions	30
Peaches	61 ^I / _—	Peppers	negligible ² / _—
Pears	negligible ² / _—	Potatoes	negligible ² / _—
Pineapples	20 ¹ / _—	Pumpkins	40
Plums/prunes	60	Spinach	30
Raisins	15	Squash	40
Beans	negligible	Tomatoes	20
		Rutabagas	30
		Watermelon	40

II. Preplant Soil Treatment

Beans/peas 20
 Cole Crops^{5/} negligible

III. Preplant Root-Dip

Asparagus 72

IV. Seed Treatment

Field corn	100	Peanuts	56
Sweet corn	75	Rice	37
Cotton	80	Small grains	5
Sorghum	94	Potatoes (seed	27
Soybeans	20	pieces)	
		Vegetables	72

1/ EPA estimates.

2/ One percent or less.

3/ Includes blueberries, blackberries, raspberries, gooseberries.

4/ Includes oranges, grapefruit, lemons, limes.

5/ Includes broccoli, brussels sprouts, cabbage, cauliflower.

cc: Valerie Bael, Captan Review Manager

