



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

AUG 1 1989

OFFICE OF
PESTICIDES AND TOXIC SUBSTANCES

MEMORANDUM

SUBJECT: Dietary Exposure and Oncogenic Risk Assessment for Atrazine

FROM: J. Robert Tomerlin, Ph.D. *J. Tomerlin 7/31/89*
Tolerance Assessment System Staff
HED/SACB (H7509C)

THROUGH: Reto Engler, Ph.D. *Reto Engler*
Chief, Science Analysis and Coordination Branch
Health Effects Division (H7509C)

TO: Jack Housenger
Section Head, SRRD/SRB (H7508C)

Action Requested

Provide an estimate of dietary exposure and associated oncogenic risk to atrazine resulting from established uses and assuming residues in water at the Office of Drinking Water's (ODW) Health Advisory Level (HAL). A previous analysis used anticipated residues for milk from dairy cattle in a local "milk shed" and meat from animals which consume sugarcane and sorghum, feed items bearing the highest atrazine residues. Per your request (J. Housenger memo, 7/21/89), the current analysis includes anticipated residues for milk from cattle and meat from animals consuming a typical diet.

Discussion

1. Toxicology Endpoint: The routine chronic TAS analysis used a reference dose (ADI) of 0.005 mg/kg body weight/day, based upon a NOEL of 0.48 mg/kg body weight/day and an uncertainty factor of 100 from a 1 year dog feeding study. This value has been approved by HED (6/3/88) and Agency (6/22/88) reference dose committees.

Atrazine has been classified as a Category C (possible human) oncogen for which quantitative risk assessment is appropriate. The upper bound oncogenic potency estimate (Q_1^*) for atrazine is 0.22 (mg/kg/day)⁻¹ (R. Engler memo, 5/23/89).

2. Residue Information: Food uses evaluated were published tolerances from 40 CFR 180.220 and ODW's Health Advisory Level for water of 3 ppb. Anticipated residues for some commodities were derived from field trial studies (M. S. Metzger memo, 9/14/88).

Anticipated residues in meat and milk for this analysis were based upon typical diets (M. S. Metzger memo, 7/14/89). These anticipated residues were further adjusted for per cent crop treated (R. Torla, cited in M. S. Metzger memo, 9/14/88).

The anticipated residues in eggs and in the meat, fat, and meat byproducts of poultry are zero. It should be noted that the anticipated residues for millet grain and sugarcane molasses are higher than the published tolerances.

NOTE: M. S. Metzger's 9/14/88 memorandum did not include sugarcane molasses as a human food item. However, after an examination of Foods and Food Production Encyclopedia (D. M. Considine and G. D. Considine, 1982), Mr. Metzger agreed that sugarcane molasses should be considered a human food item. Therefore, a residue value of 0.65 ppm was used for the TAS food "SUGAR-MOLASSES" in the analysis. A summary of the residue information used in the analysis is attached as Table 1.

3. Exposure Analysis: The TAS chronic exposure analysis uses tolerance level residues and 100 per cent crop treated to estimate the Theoretical Maximum Residue Contribution (TMRC) for the overall U.S. population and 22 population subgroups. The estimated TMRC for the overall U.S. population is 0.001091 mg/kg body weight/day, which represents 22 per cent of the ADI. The two most highly exposed TAS population groups, non-nursing infants and children aged 1 to 6, had estimated TMRCs of 0.002750 mg/kg body weight/day (55% of the ADI) and 0.002639 mg/kg body weight/day (53% of the ADI), respectively.

Using anticipated residues and per cent crop treated data to calculate the Anticipated Residue Contribution (ARC) resulted in exposure estimates lower than those calculated using tolerance level residues. The complete TMRC and ARC summaries are shown in Table 2. The ARC information and associated oncogenic risk for selected population groups is shown below.

Dietary Exposure (ARC) to Atrazine				
Commodity	Overall U.S. <u>Population</u>	Oncogenic <u>Risk</u>	Non-Nurs. <u>Infants</u>	Children <u>Aged 1 - 6</u>
Published Food Uses	0.000098 ^a	2.2×10^{-5}	0.000188	0.000278
Sugar	0.000050	1.1×10^{-5}	0.000056	0.000112
Grains	0.000038	8.4×10^{-6}	0.000093	0.000095

Footnotes on next page

Dietary Exposure to Atrazine, continued				
Commodity	Overall U.S. Population	Oncogenic Risk	Non-Nurs. Infants	Children Aged 1 - 6
Milk	0.000003 ^a	7.0×10^{-7}	0.000020	0.000009
Other ^b	0.000003	6.6×10^{-7}	0.000012	0.000017
Meat	0.000002	4.8×10^{-7}	0.000002	0.000004
Total Water	0.000101	2.2×10^{-5}	0.000424	0.000210
Food-Based Water ^c	0.000062	1.4×10^{-5}	0.000340	0.000125
Drinking Water	0.000039	8.6×10^{-6}	0.000084	0.000085
TOTAL	0.000199	4.4×10^{-5}	0.000607	0.000448

^aARC for the commodity in mg/kg body weight/day.

^bOther includes guava, macadamia nuts, and pineapple.

^cWater used to prepare food as well as the water component of milk, coffee, and tea. Some of the water used to prepare food would also be tap water, but it is not possible to determine how much.

Oncogenic risk is estimated by multiplying the exposure by the Q_1^* as shown below:

$$\begin{aligned}
 \text{Risk} &= \text{Exposure (ARC)} \times Q_1^* \\
 &= 0.000199 \text{ mg/kg/day} \times 0.22 \text{ (mg/kg/day)}^{-1} \\
 &= 4.4 \times 10^{-5}
 \end{aligned}$$

Since cancer risks are estimated over an entire lifetime, oncogenic risk was estimated only for the overall U.S. population. The exposure estimate for the overall U.S. population is based upon food consumption estimates which include infants, children, and adults, and therefore estimates lifetime exposure.

4. Comments: One of the reasons for conducting this analysis was to estimate exposure to atrazine in drinking water. TAS separates water consumption into two categories, drinking water and food water, and includes tap water in both categories. The current

implementation of TAS only permits these two water categories, with shortcomings as described in the following paragraphs.

Food water includes tap water used to prepare food, as well as the water component of commodities such as milk and carbonated beverages. Exposure estimates from drinking water only would not account for tap water used to prepare food and would therefore be too low. However, exposure estimates from drinking water plus food water overestimates exposure from tap water because it includes water from various food sources, the largest source being the water component of milk. The "Total Water" value on the previous page is thus an overestimate of exposure to atrazine from local water.

Atrazine contamination of water supplies is a localized phenomenon. In areas where atrazine does not contaminate the water supply, the exposure and oncogenic risk would be estimated by the values shown in "Published Food Uses" on the page 2. Exposure to atrazine and the associated oncogenic risk in areas in which the local water supply may be contaminated would then be estimated by adding the exposure from water to the "Published Food Uses".

An additional factor involving localized exposure involves residues in meat and milk. The previous analysis for atrazine (J. R. Tomerlin memo, 6/7/89) used residues in meat and milk from animals assumed to have consumed two feed commodities, sugarcane and sorghum, that have relatively large residues, but comprise a small proportion of the typical livestock diet. Consequently, the present analysis reports exposure based upon anticipated residues in meat and milk derived from feed items more representative of the typical diet of dairy cattle and animals grown for slaughter as described in M. Metzger's memorandum (7/14/89).

The various combinations of potential exposure lead to estimates of oncogenic risk as follows:

<u>Onco. Risk</u>	<u>Exposure Summary</u>
2.2×10^{-5}	Exposure based upon typical animal diet, water supply not contaminated at Health Advisory Level (HAL)
4.4×10^{-5}	Exposure based upon typical animal diet, water supply contaminated at HAL
3.4×10^{-5}	Exposure based upon "milk shed" animal diet, water supply not contaminated at HAL (JRT, 6/7/89)
5.6×10^{-5}	Exposure based upon "milk shed" animal diet, water supply contaminated at HAL (JRT, 6/7/89)

The preceding summary table clearly shows that the data currently available result in oncogenic risk estimates that exceed 10^{-6} . Even the least stringent assumptions (typical animal diet and a water supply free from atrazine contamination) lead to an oncogenic risk estimate of 2.2×10^{-5} . Additional data may provide anticipated residue estimates that would yield lower exposure estimates, with lower estimates of oncogenic risk. However, such data are not currently available. The chemistry review (M. Metzger memo, 7/14/89) suggests two options for providing additional estimates of anticipated residues.

Attachments

cc: ✓TAS (Tomerlin, SACB), DEB, Caswell #063, Quest (SACB), Van Gemert (TOX-HFAB), Kutney (SACB)

Table 1

CHEMICAL		STUDY TYPE		EFFECTS		TOLERANCE		ANTICIPATED		DATA GAPS/COMMENTS		STATUS	
FOOD CODE	FOOD	FOOD FORM	PET. #	(ppm)	RESIDUE (ppm)	AR STATISTIC TYPE	% CROP TREATED	RES. VALUE USED IN TAS RUN (ppm)					
Atrazine		1 yr feeding dose	Significant decr P-II waves in F at day 175 & cardiac toxicity seen in two male dogs.	AD1 UF -100	OPP RED= 0.005000	No data gaps.		HED complete 07/09/86.					
Caswell #1663		NOEL= 0.4800 mg/kg			EPA RED= 0.005000			EPA verified 05/20/87.					
CAS No 1912-24-7		15.00 ppm						HED reassess 06/03/88.					
A.I. CODE 080803		LEL= 4.9700 mg/kg						EPA verified 06/22/88.					
CFR No 180.220		150.00 ppm											
	ONCO: Class C (HED NOTE)		Evidence of oncogenicity in rats (mammary)					On IRIS.					
MACADAMIA NUTS	10 RAW-FRESH OR NFS	7F0620	P 0.250000	0.100000	AVG FLD TRIALS	50.00	0.050000						
GIUAVA	20 RAW-FRESH OR NFS	0E2393	P 0.050000	0.010000	AVG FLD TRIALS	80.00	0.008000						
GIUAVA	21 COOKED-NFS	0E2393	P 0.050000	0.010000	AVG FLD TRIALS	80.00	0.008000						
GIUAVA	62 COOKED-FRESH OR FROZEN-BAKED	0E2393	P 0.050000	0.010000	AVG FLD TRIALS	80.00	0.008000						
PINEAPPLE PULP	10 RAW-FRESH OR NFS	7F0620	P 0.250000	0.030000	AVG FLD TRIALS	80.00	0.024000						
PINEAPPLE PULP	21 COOKED-NFS	7F0620	P 0.250000	0.030000	AVG FLD TRIALS	80.00	0.024000						
PINEAPPLE PULP	31 COOKED-FRESH OR CANNED	7F0620	P 0.250000	0.030000	AVG FLD TRIALS	80.00	0.024000						
PINEAPPLE-DRIED	10 RAW-FRESH OR NFS	7F0620	P 0.250000	0.030000	AVG FLD TRIALS	80.00	0.024000						
PINEAPPLE-JUICE	10 RAW-FRESH OR NFS	7F0620	P 0.250000	0.030000	AVG FLD TRIALS	80.00	0.024000						
PINEAPPLE-JUICE	15 RAW-FRESH OR CANNED	7F0620	P 0.250000	0.030000	AVG FLD TRIALS	80.00	0.024000						
PINEAPPLE-JUICE	21 COOKED-NFS	7F0620	P 0.250000	0.030000	AVG FLD TRIALS	80.00	0.024000						
PINEAPPLE-JUICE	31 COOKED-FRESH OR CANNED	7F0620	P 0.250000	0.030000	AVG FLD TRIALS	80.00	0.024000						
CORN, POP	21 COOKED-NFS	7F0620	P 0.250000	0.100000	AVG FLD TRIALS	70.00	0.070000						
CORN, SWEET	10 RAW-FRESH OR NFS	7F0620	P 0.250000	0.100000	AVG FLD TRIALS	60.00	0.060000						
CORN, SWEET	21 COOKED-NFS	7F0620	P 0.250000	0.100000	AVG FLD TRIALS	60.00	0.060000						
CORN, SWEET	31 COOKED-FRESH OR CANNED	7F0620	P 0.250000	0.100000	AVG FLD TRIALS	60.00	0.060000						
CORN, GRAIN-ENDO	10 RAW-FRESH OR NFS	7F0620	P 0.250000	0.100000	AVG FLD TRIALS	70.00	0.070000						
CORN, GRAIN-ENDO	21 COOKED-NFS	7F0620	P 0.250000	0.100000	AVG FLD TRIALS	70.00	0.070000						
CORN, GRAIN-ENDO	22 COOKED-FRESH-BAKED	7F0620	P 0.250000	0.100000	AVG FLD TRIALS	70.00	0.070000						
CORN, GRAIN-ENDO	23 COOKED-FRESH-BOILED	7F0620	P 0.250000	0.100000	AVG FLD TRIALS	70.00	0.070000						
CORN, GRAIN-BRAN	00 NOT SPECIFIED (NO CONSUMPTION)	7F0620	P 0.250000	0.100000	AVG FLD TRIALS	70.00	0.070000						
CORN SUGAR	10 RAW-FRESH OR NFS	7F0620	P 0.250000	0.100000	AVG FLD TRIALS	70.00	0.070000						
CORN SUGAR	21 COOKED-NFS	7F0620	P 0.250000	0.100000	AVG FLD TRIALS	70.00	0.070000						
CORN SUGAR	22 COOKED-FRESH-BAKED	7F0620	P 0.250000	0.100000	AVG FLD TRIALS	70.00	0.070000						
SORGHUM	00 NOT SPECIFIED (NO CONSUMPTION)	7F0620	P 0.250000	0.100000	AVG FLD TRIALS	70.00	0.070000						
WHEAT, POUCH	10 RAW-FRESH OR NFS	7F0620	P 0.250000	0.020000	AVG FLD TRIALS	1.00	0.000200						
WHEAT, POUCH	21 COOKED-NFS	7F0620	P 0.250000	0.020000	AVG FLD TRIALS	1.00	0.000200						
WHEAT, POUCH	22 COOKED-FRESH-BAKED	7F0620	P 0.250000	0.020000	AVG FLD TRIALS	1.00	0.000200						
WHEAT, POUCH	23 COOKED-FRESH-BOILED	7F0620	P 0.250000	0.020000	AVG FLD TRIALS	1.00	0.000200						
WHEAT, GENM	10 RAW-FRESH OR NFS	7F0620	P 0.250000	0.020000	AVG FLD TRIALS	1.00	0.000200						
WHEAT, GENM	22 COOKED-FRESH-BAKED	7F0620	P 0.250000	0.020000	AVG FLD TRIALS	1.00	0.000200						
WHEAT, GENM	10 RAW-FRESH OR NFS	7F0620	P 0.250000	0.020000	AVG FLD TRIALS	1.00	0.000200						
WHEAT, GENM	21 COOKED-NFS	7F0620	P 0.250000	0.020000	AVG FLD TRIALS	1.00	0.000200						
WHEAT, GENM	22 COOKED-FRESH-BAKED	7F0620	P 0.250000	0.020000	AVG FLD TRIALS	1.00	0.000200						
WHEAT, GENM	23 COOKED-FRESH-BOILED	7F0620	P 0.250000	0.020000	AVG FLD TRIALS	1.00	0.000200						
WHEAT, GENM	10 RAW-FRESH OR NFS	7F0620	P 0.250000	0.020000	AVG FLD TRIALS	1.00	0.000200						
WHEAT, GENM	21 COOKED-NFS	7F0620	P 0.250000	0.020000	AVG FLD TRIALS	1.00	0.000200						
WHEAT, GENM	22 COOKED-FRESH-BAKED	7F0620	P 0.250000	0.020000	AVG FLD TRIALS	1.00	0.000200						
WHEAT, GENM	23 COOKED-FRESH-BOILED	7F0620	P 0.250000	0.020000	AVG FLD TRIALS	1.00	0.000200						
WHEAT, GENM	10 RAW-FRESH OR NFS	7F0620	P 0.250000	0.020000	AVG FLD TRIALS	1.00	0.000200						
WHEAT, GENM	21 COOKED-NFS	7F0620	P 0.250000	0.020000	AVG FLD TRIALS	1.00	0.000200						
WHEAT, GENM	22 COOKED-FRESH-BAKED	7F0620	P 0.250000	0.020000	AVG FLD TRIALS	1.00	0.000200						
WHEAT, GENM	23 COOKED-FRESH-BOILED	7F0620	P 0.250000	0.020000	AVG FLD TRIALS	1.00	0.000200						
WHEAT, GENM	10 RAW-FRESH OR NFS	7F0620	P 0.250000	0.020000	AVG FLD TRIALS	1.00	0.000200						
WHEAT, GENM	21 COOKED-NFS	7F0620	P 0.250000	0.020000	AVG FLD TRIALS	1.00	0.000200						
WHEAT, GENM	22 COOKED-FRESH-BAKED	7F0620	P 0.250000	0.020000	AVG FLD TRIALS	1.00	0.000200						
WHEAT, GENM	23 COOKED-FRESH-BOILED	7F0620	P 0.250000	0.020000	AVG FLD TRIALS	1.00	0.000200						
WHEAT, GENM	10 RAW-FRESH OR NFS	7F0620	P 0.250000	0.020000	AVG FLD TRIALS	1.00	0.000200						
WHEAT, GENM	21 COOKED-NFS	7F0620	P 0.250000	0.020000	AVG FLD TRIALS	1.00	0.000200						
WHEAT, GENM	22 COOKED-FRESH-BAKED	7F0620	P 0.250000	0.020000	AVG FLD TRIALS	1.00	0.000200						
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WHEAT, GENM	10 RAW-FRESH OR NFS	7F0620	P 0.250000	0.020000	AVG FLD TRIALS	1.00	0.000200						
WHEAT, GENM	21 COOKED-NFS	7F0620	P 0.250000	0.020000	AVG FLD TRIALS	1.00	0.000200						
WHEAT, GENM	22 COOKED-FRESH-BAKED	7F0620	P 0.250000	0.020000	AVG FLD TRIALS	1.00	0.000200						
WHEAT, GENM	23 COOKED-FRESH-BOILED	7F0620	P 0.250000	0.020000	AVG FLD TRIALS	1.00	0.000200						
WHEAT, GENM	10 RAW-FRESH OR NFS	7F0620	P 0.250000	0.020000	AVG FLD TRIALS	1.00	0.000200						
WHEAT, GENM	21 COOKED-NFS	7F0620	P 0.250000	0.020000	AVG FLD TRIALS	1.00	0.000200						
WHEAT, GENM	22 COOKED-FRESH-BAKED	7F0620	P 0.250000	0.020000	AVG FLD TRIALS	1.00	0.000200						
WHEAT, GENM	23 COOKED-FRESH-BOILED	7F0620	P 0.250000	0.020000	AVG FLD TRIALS	1.00	0.000200						
WHEAT, GENM	10 RAW-FRESH OR NFS	7F0620	P 0.250000	0.020000	AVG FLD TRIALS	1.00	0.000200						
WHEAT, GENM	21 COOKED-NFS	7F0620	P 0.250000	0.020000	AVG FLD TRIALS	1.00	0.000200						
WHEAT, GENM	22 COOKED-FRESH-BAKED	7F0620	P 0.250000	0.020000	AVG FLD TRIALS	1.00	0.000200						
WHEAT, GENM	23 COOKED-FRESH-BOILED	7F0620	P 0.250000	0.020000	AVG FLD TRIALS	1.00	0.000200						
WHEAT, GENM	10 RAW-FRESH OR NFS	7F0620	P 0.250000	0.020000	AVG FLD TRIALS	1.00	0.000200						
WHEAT, GENM	21 COOKED-NFS	7F0620	P 0.250000	0.020000	AVG FLD TRIALS	1.00	0.000200						
WHEAT, GENM	22 COOKED-FRESH-BAKED	7F0620	P 0.250000	0.020000	AVG FLD TRIALS	1.00</							

Table 1, continued

ANTICIPATED RESIDUE INFORMATION FOR CASWELL NUMBER 063

DATE: 07/27/89

PAGE: 2

CHEMICAL		ACTION TYPE		EFFECTS	REFERENCE DOSES		DATA GAPS/COMMENTS		STATUS
Atrazine	Caswell #063	lyr feeding- dog	NOEL= 0.4800 mg/kg	Significant decr P-II waves in F at day 175 & cardiac toxicity seen in two male dogs.	ADI UF -->100	OPP RID= 0.005000	No data gaps.	HED complete 07/09/86.	
CAS No. 1912-24-9	A.I. CODE: 080803	LEL= 4.9700 mg/kg	15.00 ppm			EPA RID= 0.005000	Rat Reproduction study as co-critical; NOEL=0.5 mg/kg/kg/day.	EPA verified 05/20/87.	
CFR No. 180.220		150.00 ppm		Evidence of oncogenicity in rats (mammary).			Q* calculated.	EPA verified 06/22/88.	
		Class C (HED NOTE)						On IRIS.	
FOOD CODE	FOOD	FOOD FORM	TOLERANCE (ppm)	PET. #	ANTICIPATED RESIDUE (ppm)	AR STATISTIC TYPE	% CROP TREATED	RES. VALUE USED IN TAS RUN (ppm)	
25003SA	CANE SUGAR	10 RAW-FRESH OR NFS	P 0.250000		0.160000	AVG FLD TRIALS	40.00	0.064000	
25003SA	CANE SUGAR	21 COOKED-NFS	P 0.250000		0.160000	AVG FLD TRIALS	40.00	0.064000	
25003SA	CANE SUGAR	22 COOKED-FRESH-BAKED	P 0.250000		0.160000	AVG FLD TRIALS	40.00	0.064000	
25003SA	CANE SUGAR	31 COOKED-FRESH OR CANNED	P 0.250000		0.160000	AVG FLD TRIALS	40.00	0.064000	
25003SB	SUGAR-MOLASSES	10 RAW-FRESH OR NFS	P 0.250000		0.650000	AVG FLD TRIALS	40.00	0.260000	
25003SB	SUGAR-MOLASSES	21 COOKED-NFS	P 0.250000		0.650000	AVG FLD TRIALS	40.00	0.260000	
25003SB	SUGAR-MOLASSES	22 COOKED-FRESH-BAKED	P 0.250000		0.650000	AVG FLD TRIALS	40.00	0.260000	
25003SB	SUGAR-MOLASSES	31 COOKED-FRESH OR CANNED	P 0.250000		0.650000	AVG FLD TRIALS	40.00	0.260000	
270020A	CORN GRAIN-OIL	18 PROCESSED OIL	P 0.250000	7F0620	0.100000	AVG FLD TRIALS	70.00	0.070000	
50007DB	MILK-NON-FAT 5% FAT	10 RAW-FRESH OR NFS	P 0.020000	7F0620	0.000300	AVG FLD TRIALS	100.00	0.000300	
50007DB	MILK-NON-FAT 5% FAT	21 COOKED-NFS	P 0.020000	7F0620	0.000300	AVG FLD TRIALS	100.00	0.000300	
50007DB	MILK-NON-FAT 5% FAT	31 COOKED-CANNED	P 0.020000	7F0620	0.000300	AVG FLD TRIALS	100.00	0.000300	
50007FA	MILK-FAT 5% FAT	10 RAW-FRESH OR NFS	P 0.020000	7F0620	0.000300	AVG FLD TRIALS	100.00	0.000300	
50007FA	MILK-FAT 5% FAT	21 COOKED-NFS	P 0.020000	7F0620	0.000300	AVG FLD TRIALS	100.00	0.000300	
50007FA	MILK-FAT 5% FAT	31 COOKED-CANNED	P 0.020000	7F0620	0.000300	AVG FLD TRIALS	100.00	0.000300	
50007SA	MILK-SUG (LACT)	21 COOKED-NFS	P 0.020000	7F0620	0.000300	AVG FLD TRIALS	100.00	0.000300	
50007SA	MILK-SUG (LACT)	31 COOKED-CANNED	P 0.020000	7F0620	0.000300	AVG FLD TRIALS	100.00	0.000300	
50011BA	BEEF-MEAT BYT	21 COOKED-NFS	P 0.020000	7F0620	0.001000	AVG FLD TRIALS	100.00	0.001000	
50011BA	BEEF-MEAT BYT	26 COOKED-FRESH-PICKLED, CORNED, OR CURED	P 0.020000	7F0620	0.001000	AVG FLD TRIALS	100.00	0.001000	
50011BA	BEEF-MEAT BYT	31 COOKED-CANNED	P 0.020000	7F0620	0.001000	AVG FLD TRIALS	100.00	0.001000	
50011BB	BEEF-OTH ORGAN	21 COOKED-NFS	P 0.020000	7F0620	0.001000	AVG FLD TRIALS	100.00	0.001000	
50011BB	BEEF-OTH ORGAN	31 COOKED-CANNED	P 0.020000	7F0620	0.001000	AVG FLD TRIALS	100.00	0.001000	
50011FA	BEEF-FAT	21 COOKED-NFS	P 0.020000	7F0620	0.001000	AVG FLD TRIALS	100.00	0.001000	
50011FA	BEEF-FAT	10 RAW-FRESH OR NFS	P 0.020000	7F0620	0.001000	AVG FLD TRIALS	100.00	0.001000	
50011FA	BEEF-FAT	21 COOKED-NFS	P 0.020000	7F0620	0.001000	AVG FLD TRIALS	100.00	0.001000	
50011FA	BEEF-FAT	22 COOKED-FRESH-BAKED	P 0.020000	7F0620	0.001000	AVG FLD TRIALS	100.00	0.001000	
50011FA	BEEF-FAT	23 COOKED-FRESH-BOILED	P 0.020000	7F0620	0.001000	AVG FLD TRIALS	100.00	0.001000	
50011FA	BEEF-FAT	24 COOKED-FRESH-BROILED	P 0.020000	7F0620	0.001000	AVG FLD TRIALS	100.00	0.001000	
50011FA	BEEF-FAT	25 COOKED-FRESH-FRIED	P 0.020000	7F0620	0.001000	AVG FLD TRIALS	100.00	0.001000	
50011KA	BEEF-KIDNEY	21 COOKED-NFS	P 0.020000	7F0620	0.001000	AVG FLD TRIALS	100.00	0.001000	
50011KA	BEEF-KIDNEY	25 COOKED-FRESH-FRIED	P 0.020000	7F0620	0.002000	AVG FLD TRIALS	100.00	0.002000	
50011LA	BEEF-LIVER	21 COOKED-NFS	P 0.020000	7F0620	0.002000	AVG FLD TRIALS	100.00	0.002000	
50011LA	BEEF-LIVER	31 COOKED-FRESH OR CANNED	P 0.020000	7F0620	0.001000	AVG FLD TRIALS	100.00	0.001000	
50011MA	BEEF-LEAN	10 RAW-FRESH OR NFS	P 0.020000	7F0620	0.001000	AVG FLD TRIALS	100.00	0.001000	
50011MA	BEEF-LEAN	21 COOKED-NFS	P 0.020000	7F0620	0.001000	AVG FLD TRIALS	100.00	0.001000	
50011MA	BEEF-LEAN	22 COOKED-FRESH-BAKED	P 0.020000	7F0620	0.001000	AVG FLD TRIALS	100.00	0.001000	
50011MA	BEEF-LEAN	23 COOKED-FRESH-BOILED	P 0.020000	7F0620	0.001000	AVG FLD TRIALS	100.00	0.001000	
50011MA	BEEF-LEAN	24 COOKED-FRESH-BROILED	P 0.020000	7F0620	0.001000	AVG FLD TRIALS	100.00	0.001000	
50011MA	BEEF-LEAN	25 COOKED-FRESH-FRIED	P 0.020000	7F0620	0.001000	AVG FLD TRIALS	100.00	0.001000	
50011MA	BEEF-LEAN	30 NOT SPECIFIED (NO CONSUMPTION)	P 0.020000	7F0620	0.001000	AVG FLD TRIALS	100.00	0.001000	
50011MA	BEEF-LEAN	31 COOKED-FRESH (NO CONSUMPTION)	P 0.020000	7F0620	0.001000	AVG FLD TRIALS	100.00	0.001000	
50011MA	BEEF-LEAN	32 COOKED-FRESH (NO CONSUMPTION)	P 0.020000	7F0620	0.001000	AVG FLD TRIALS	100.00	0.001000	
50011MA	BEEF-LEAN	33 COOKED-FRESH (NO CONSUMPTION)	P 0.020000	7F0620	0.001000	AVG FLD TRIALS	100.00	0.001000	
50011MA	BEEF-LEAN	34 COOKED-FRESH (NO CONSUMPTION)	P 0.020000	7F0620	0.001000	AVG FLD TRIALS	100.00	0.001000	
50011MA	BEEF-LEAN	35 COOKED-FRESH (NO CONSUMPTION)	P 0.020000	7F0620	0.001000	AVG FLD TRIALS	100.00	0.001000	
50011MA	BEEF-LEAN	36 COOKED-FRESH (NO CONSUMPTION)	P 0.020000	7F0620	0.001000	AVG FLD TRIALS	100.00	0.001000	
50011MA	BEEF-LEAN	37 COOKED-FRESH (NO CONSUMPTION)	P 0.020000	7F0620	0.001000	AVG FLD TRIALS	100.00	0.001000	
50011MA	BEEF-LEAN	38 COOKED-FRESH (NO CONSUMPTION)	P 0.020000	7F0620	0.001000	AVG FLD TRIALS	100.00	0.001000	
50011MA	BEEF-LEAN	39 COOKED-FRESH (NO CONSUMPTION)	P 0.020000	7F0620	0.001000	AVG FLD TRIALS	100.00	0.001000	
50011MA	BEEF-LEAN	40 COOKED-FRESH (NO CONSUMPTION)	P 0.020000	7F0620	0.001000	AVG FLD TRIALS	100.00	0.001000	
50011MA	BEEF-LEAN	41 COOKED-FRESH (NO CONSUMPTION)	P 0.020000	7F0620	0.001000	AVG FLD TRIALS	100.00	0.001000	
50011MA	BEEF-LEAN	42 COOKED-FRESH (NO CONSUMPTION)	P 0.020000	7F0620	0.001000	AVG FLD TRIALS	100.00	0.001000	
50011MA	BEEF-LEAN	43 COOKED-FRESH (NO CONSUMPTION)	P 0.020000	7F0620	0.001000	AVG FLD TRIALS	100.00	0.001000	
50011MA	BEEF-LEAN	44 COOKED-FRESH (NO CONSUMPTION)	P 0.020000	7F0620	0.001000	AVG FLD TRIALS	100.00	0.001000	
50011MA	BEEF-LEAN	45 COOKED-FRESH (NO CONSUMPTION)	P 0.020000	7F0620	0.001000	AVG FLD TRIALS	100.00	0.001000	

Table 1, continued

CHEMICAL		STUDY TYPE		EFFECTS		REFERENCE DOSES		DATA GAPS/COMMENTS		STATUS	
Altrazine	lyr feeding- dog	Significant decr P-II waves in F at day 175 & cardiac toxicity seen in two male dogs.	ADI	UF	OPR RfD= 0.005000	No data gaps.	HED complete 07/09/86.				
Caswell #063	NOEL= 0 4800 mg/kg				OPR RfD= 0.005000		EPA verified 05/20/87.				
CAS No 1912-24-9	15 00 ppm				EPA RfD= 0.005000		HED reassess 06/03/88.				
A.I. CODE 240304	IEL= 4 9/00 mg					Rat Reproduction study as co-critical; NOEL=0.5 mg/kg/day	EPA verified 06/22/88.				
CFR No 180.220	150 00 ppm	Evidence of oncogenicity in rats (mammary).				Q* calculated.	On IRIS.				
ONCO Class C (HED M.T.)											
FOOD CODE	FOOD FORM	TOLERANCE (ppm)	ANTICIPATED RESIDUE (ppm)	AR STATISTIC TYPE	% CROP TREATED	RES. VALUE USED IN TAS RUN (ppm)					
COAT KIDNEY	00 NOT SPECIFIED (NO CONSUMPTION)	7F0620	0.001000	AVG FLD TRIALS	100.00	0.001000					
COAT LIVER	00 NOT SPECIFIED (NO CONSUMPTION)	7F0620	0.002000	AVG FLD TRIALS	100.00	0.002000					
COAT LEAN	21 COOKED-FRESH-RITLED	7F0620	0.001000	AVG FLD TRIALS	100.00	0.001000					
COAT LEAN	25 COOKED-FRESH-RITLED	7F0620	0.001000	AVG FLD TRIALS	100.00	0.001000					
HORSE	00 NOT SPECIFIED (NO CONSUMPTION)	7F0620	0.001000	AVG FLD TRIALS	100.00	0.001000					
SHEEP-MEAT BYP	21 COOKED-NFS	7F0620	0.001000	AVG FLD TRIALS	100.00	0.001000					
SHEEP-OTH ORGAN	21 COOKED-NFS	7F0620	0.001000	AVG FLD TRIALS	100.00	0.001000					
SHEEP-FAT	21 COOKED-NFS	7F0620	0.001000	AVG FLD TRIALS	100.00	0.001000					
SHEEP-KIDNEY	21 COOKED-NFS	7F0620	0.001000	AVG FLD TRIALS	100.00	0.001000					
SHEEP-LIVER	00 NOT SPECIFIED (NO CONSUMPTION)	7F0620	0.001000	AVG FLD TRIALS	100.00	0.001000					
SHEEP-LEAN	21 COOKED-NFS	7F0620	0.002000	AVG FLD TRIALS	100.00	0.002000					
SHEEP-LEAN	21 COOKED-NFS	7F0620	0.001000	AVG FLD TRIALS	100.00	0.001000					
PORK MEAT BYP	21 COOKED-NFS	7F0620	0.001000	AVG FLD TRIALS	100.00	0.001000					
PORK-OTH ORGAN	21 COOKED-NFS	7F0620	0.001000	AVG FLD TRIALS	100.00	0.001000					
PORK-OTH ORGAN	25 COOKED-FRESH-PICKLED, CORNED, OR CURED	7F0620	0.001000	AVG FLD TRIALS	100.00	0.001000					
PORK-FAT	21 COOKED-NFS	7F0620	0.001000	AVG FLD TRIALS	100.00	0.001000					
PORK-FAT	25 COOKED-FRESH-RITLED	7F0620	0.001000	AVG FLD TRIALS	100.00	0.001000					
PORK-FAT	25 COOKED-FRESH-RITLED	7F0620	0.001000	AVG FLD TRIALS	100.00	0.001000					
PORK-FAT	26 COOKED-FRESH-PICKLED, CORNED, OR CURED	7F0620	0.001000	AVG FLD TRIALS	100.00	0.001000					
PORK KIDNEY	21 COOKED-NFS	7F0620	0.001000	AVG FLD TRIALS	100.00	0.001000					
PORK LIVER	21 COOKED-NFS	7F0620	0.002000	AVG FLD TRIALS	100.00	0.002000					
PORK LIVER	25 COOKED-FRESH-FRIED	7F0620	0.002000	AVG FLD TRIALS	100.00	0.002000					
PORK-LEAN	21 COOKED-NFS	7F0620	0.001000	AVG FLD TRIALS	100.00	0.001000					
PORK-LEAN	25 COOKED-FRESH-FRIED	7F0620	0.001000	AVG FLD TRIALS	100.00	0.001000					
PORK-LEAN	26 COOKED-FRESH-PICKLED, CORNED, OR CURED	7F0620	0.001000	AVG FLD TRIALS	100.00	0.001000					
PORK-LEAN	26 COOKED-FRESH-PICKLED, CORNED, OR CURED	7F0620	0.001000	AVG FLD TRIALS	100.00	0.001000					
TURKEY-BYP	21 COOKED-NFS	7F0620	0.000000	AVG FLD TRIALS	100.00	0.000000					
TURKEY-BYP	26 COOKED-FRESH-PICKLED, CORNED, OR CURED	7F0620	0.000000	AVG FLD TRIALS	100.00	0.000000					
TURKEY ORGAN	21 COOKED-NFS	7F0620	0.000000	AVG FLD TRIALS	100.00	0.000000					
TURKEY ORGAN	25 COOKED-FRESH-FRIED	7F0620	0.000000	AVG FLD TRIALS	100.00	0.000000					
TURKEY W/O SKIN	21 COOKED-NFS	7F0620	0.000000	AVG FLD TRIALS	100.00	0.000000					
TURKEY W/O SKIN	25 COOKED-FRESH OR CANNED	7F0620	0.000000	AVG FLD TRIALS	100.00	0.000000					
TURKEY W/O SKIN	26 COOKED-FRESH OR FROZEN-BAKED	7F0620	0.000000	AVG FLD TRIALS	100.00	0.000000					
TURKEY W/O SKIN	21 COOKED-NFS	7F0620	0.000000	AVG FLD TRIALS	100.00	0.000000					
TURKEY-SKIN	25 COOKED-FRESH-FRIED	7F0620	0.000000	AVG FLD TRIALS	100.00	0.000000					
TURKEY-SKIN	25 COOKED-FRESH-FRIED	7F0620	0.000000	AVG FLD TRIALS	100.00	0.000000					
TURKEY-UNSPEC	00 NOT SPECIFIED (NO CONSUMPTION)	7F0620	0.000000	AVG FLD TRIALS	100.00	0.000000					
POULTRY, OTII-BYP	25 COOKED-FRESH-FRIED	7F0620	0.000000	AVG FLD TRIALS	100.00	0.000000					
POULTRY, ORGAN	25 COOKED-FRESH-FRIED	7F0620	0.000000	AVG FLD TRIALS	100.00	0.000000					
POULTRY, OTHER	21 COOKED-NFS	7F0620	0.000000	AVG FLD TRIALS	100.00	0.000000					
POULTRY, OTHER	10 RAW-FRESH OR NFS	7F0620	0.000000	AVG FLD TRIALS	100.00	0.000000					
EGGS-WHOLE											

Table 1, continued

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Table 2

- *Current TMRC does not include new or pending tolerances.
- **New TMRC includes new, pending, and published tolerances.

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