REVIEWER

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

JUL 25 1989

OFFICE OF
PESTICIDES AND TOXIC SUBSTANCES

MEMORANDUM

SUBJECT: Dietary Exposure Analysis for the Coumaphos Reregistration Using Anticipated Residue Data

FROM: J. Robert Tomerlin, Ph.D. J.R. Tomerlin 7/21/89
Tolerance Assessment System Staff
HED/SACB (H7509C)

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

TO: Lois Rossi, Chief
Reregistration Branch
Special Review Reregistration Division (H7508C)

Action Requested

A preliminary TAS analysis for published uses of coumaphos assuming that 100 per cent of registered commodities contained tolerance level residues resulted in exposure estimates that exceeded the reference dose. Consequently, anticipated residue data were requested and were used in the re-analysis reported here.

Discussion

1. Toxicology Endpoint: The routine chronic TAS analysis used a reference dose (PADI) of 0.0007 mg/kg body weight/day, based upon a NOEL of 0.07 mg/kg body weight/day and an uncertainty factor of 100 from a 2 year rat feeding study. This value has been approved by HED (3/30/89) and Agency (4/20/89) reference dose committees.

An endpoint for the acute inhibition of cholinesterase (ChE) was observed in female rats. Clinical signs were observed within four hours at the lowest dose tested. The LEL from this study was 5 mg/kg body weight (personal communication, W. Greear).

2. Residue Information: Food uses evaluated were published tolerances from 40 CFR 180.189. Anticipated residue (AR) data were developed for meat, poultry, eggs, and milk (M. S. Metzger memo, 7/18/89). We do not have estimates of per cent of the animals that are treated with the pesticide. Average residues were used for the chronic exposure analysis; 95th percentile or maximum residues were used for the acute exposure analysis. Summaries of the residue data used in the analysis are attached as Table 1a and 1b.

3. Chronic 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 Anticipated Residue Contribution (ARC) is calculated using anticipated residues rather than tolerances in the exposure calculaton. The TMRC and ARC information for the overall U.S. population and all 22 TAS population groups is shown in Table 2. The exposure information for the overall U.S. population and the two most highly exposed groups, non-nursing infants and children aged 1 to 6 is shown in the following table.

TMRC and ARC Exposure Summaries for Coumaphos

| | Overall U.S. Population | Non-Nurs. Infants | Children Aged 1 - 6 |
|---|---|---|---|
| TMRC - Using Tolerances and 100% Crop Treated | 0.003011[a]<br>430.2[b] | 0.003972<br>567.5 | 0.005846<br>835.1 |
| ARC - Using Anticipated Residues | 0.000169<br>24.1 | 0.000183<br>26.2 | 0.0.000322<br>46.0 |

[a]Exposure estimate in mg/kg body weight/day.
[b]Estimated exposure expressed as per cent of the PADI.

4. Acute Exposure Analysis: The TAS acute dietary exposure analysis with anticipated residues estimates the distribution of single-day exposures for certain population subgroups. Each distribution represents the exposure profile for the individuals who consumed commodities containing coumaphos residues at the levels shown in Table 1b.

The acute dietary exposure to coumaphos is compared to the NOEL for ChE inhibition of 5 mg/kg body weight from the rat study. The margin of safety (MOS) for acute exposure is calculated as the ratio of the NOEL to the estimated exposure. For example, the estimated MOS for the average U.S. consumer is calculated as:

MOS = NOEL / EXPOSURE (ARC)

= (5 mg/kg) / (0.000798 mg/kg body weight)

= 6300 (approximately)

The exposure profiles for the overall U.S. population and the four TAS population groups for which acute exposure analyses are calculated is shown in Table 3. Note that the minimum average MOS,

experienced by infants, is 3200. The absolute minimum MOS of 500 for any individual occurs in the children group.

5. Comments: Average anticipated residues were used to calculate chronic exposure to coumaphos. However, it was still assumed that 100 per cent of the registered commodities would contain residues. Under this assumption, exposure is not expected to exceed the reference dose for any TAS population group. Note that the reference dose for ChE inhibition is 100. Receipt and review of additional toxicology data may result in a modified reference dose which would in turn affect the percentage of the reference dose occupied by the estimated exposure.

Acute exposure was evaluated with either 95th percentile or maximum residue values. The analysis is conducted for consumers of the commodities only, but assumes that all registered commodities contain coumaphos residues and further assumes that all registered commodities are eaten at one sitting. Even under these stringent assumptions, acute exposure to coumaphos is not expected to result in an MOS less than 500 for any TAS population group.

Attachments

cc: TAS (Tomerlin, SACB), DEB, Caswell #335, Kocialski (SACB), Greear (TOX-IRSB)

# Table 1

ANTICIPATED RESIDUE INFORMATION FOR CASWELL NUMBER 335 DATE: 07/19/89 PAGE: 1

| CHEMICAL | STUDY TYPE | EFFECTS | REFERENCE DOSES | DATA GAPS/COMMENTS | STATUS |
|---|---|---|---|---|---|
| Coumaphos | 2yr feeding- rat | Plasma ChE inhibition in | PADI UF -->100 | Chronic feeding - dog | HED complete 03/30/89. |
| Caswell #335 | NOEL= 0.0700 mg/kg | females. | OPP RfD= 0.000700 | Reproduction - rat | EPA deferred 04/20/89; |
| CAS No. 56-72-4 | 1.00 ppm | (Actual dose tested) | EPA RfD= 0.000000 | Oncogneicity - mouse | Pending RAC approval of |
| A.I. CODE: 036501 | LEL= 0.3600 mg/kg | | | | RAF ChE report. |
| CFR No. 180.189 | 5.00 ppm | No evidence of oncogenic- | | | WHO TADI withdrawn 1980; |
| | ONCO: Negative- 1 species. | ity in rat. | | | WHO last reviewed 1987. |

| FOOD CODE | FOOD | FOOD FORM | PET.# | TOLERANCE (ppm) | ANTICIPATED RESIDUE (ppm) | AR STATISTIC TYPE | % CROP TREATED | RES. VALUE USED IN TAS RUN (ppm) |
|---|---|---|---|---|---|---|---|---|
| 50000FA | MILK-FAT SOLIDS | 10 RAW-FRESH OR NFS | 306 | P 0.500000 | 0.006000C | | 100.00 | 0.006000 |
| 50000FA | MILK-FAT SOLIDS | 21 COOKED-NFS | 306 | P 0.500000 | 0.006000C | | 100.00 | 0.006000 |
| 50000FA | MILK-FAT SOLIDS | 51 COOKED-CANNED | 306 | P 0.500000 | 0.006000C | | 100.00 | 0.006000 |
| 53001BA | BEEF-MEAT BYP | 21 COOKED-NFS | 299 | P 1.000000 | 0.150000 | | 100.00 | 0.150000 |
| 53001BA | BEEF-MEAT BYP | 26 COOKED-FRESH-PICKLED,CORNED,OR CURED | 299 | P 1.000000 | 0.150000 | | 100.00 | 0.150000 |
| 53001BB | BEEF-OTH ORGAN | 21 COOKED-NFS | 299 | P 1.000000 | 0.100000 | | 100.00 | 0.100000 |
| 53001BB | BEEF-OTH ORGAN | 51 COOKED-CANNED | 299 | P 1.000000 | 0.100000 | | 100.00 | 0.100000 |
| 53001DA | BEEF-DRIED | 21 COOKED-NFS | 299 | P 1.000000 | 0.030000 | | 100.00 | 0.030000 |
| 53001FA | BEEF-FAT | 10 RAW-FRESH OR NFS | 299 | P 1.000000 | 0.150000 | | 100.00 | 0.150000 |
| 53001FA | BEEF-FAT | 21 COOKED-NFS | 299 | P 1.000000 | 0.150000 | | 100.00 | 0.150000 |
| 53001FA | BEEF-FAT | 22 COOKED-FRESH-BAKED | 299 | P 1.000000 | 0.150000 | | 100.00 | 0.150000 |
| 53001FA | BEEF-FAT | 23 COOKED-FRESH-BOILED | 299 | P 1.000000 | 0.150000 | | 100.00 | 0.150000 |
| 53001FA | BEEF-FAT | 24 COOKED-FRESH-BROILED | 299 | P 1.000000 | 0.150000 | | 100.00 | 0.150000 |
| 53001FA | BEEF-FAT | 25 COOKED-FRESH-FRIED | 299 | P 1.000000 | 0.150000 | | 100.00 | 0.150000 |
| 53001KA | BEEF-KIDNEY | 21 COOKED-NFS | 299 | P 1.000000 | 0.040000 | | 100.00 | 0.040000 |
| 53001LA | BEEF-LIVER | 25 COOKED-FRESH-FRIED | 299 | P 1.000000 | 0.100000 | | 100.00 | 0.100000 |
| 53001LA | BEEF-LIVER | 31 COOKED-FRESH OR CANNED | 299 | P 1.000000 | 0.100000 | | 100.00 | 0.100000 |
| 53001MA | BEEF-LEAN | 10 RAW-FRESH OR NFS | 299 | P 1.000000 | 0.030000 | | 100.00 | 0.030000 |
| 53001MA | BEEF-LEAN | 21 COOKED-NFS | 299 | P 1.000000 | 0.030000 | | 100.00 | 0.030000 |
| 53001MA | BEEF-LEAN | 22 COOKED-FRESH-BAKED | 299 | P 1.000000 | 0.030000 | | 100.00 | 0.030000 |
| 53001MA | BEEF-LEAN | 23 COOKED-FRESH-BOILED | 299 | P 1.000000 | 0.030000 | | 100.00 | 0.030000 |
| 53001MA | BEEF-LEAN | 24 COOKED-FRESH-BROILED | 299 | P 1.000000 | 0.030000 | | 100.00 | 0.030000 |
| 53002BA | GOAT-MEAT BYP | 00 NOT SPECIFIED | 299 | P 1.000000 | 0.500000 | | 100.00 | 0.500000 |
| 53002BB | GOAT-OTH ORGAN | 00 NOT SPECIFIED | 299 | P 1.000000 | 0.030000 | | 100.00 | 0.030000 |
| 53002FA | GOAT-FAT | 23 COOKED-FRESH-BOILED | 299 | P 1.000000 | 0.500000 | | 100.00 | 0.500000 |
| 53002FA | GOAT-FAT | 25 COOKED-FRESH-FRIED | 299 | P 1.000000 | 0.500000 | | 100.00 | 0.500000 |
| 53002KA | GOAT-KIDNEY | 00 NOT SPECIFIED | 299 | P 1.000000 | 0.020000 | | 100.00 | 0.020000 |
| 53002LA | GOAT-LIVER | 00 NOT SPECIFIED | 299 | P 1.000000 | 0.030000 | | 100.00 | 0.030000 |
| 53002MA | GOAT-LEAN | 23 COOKED-FRESH-BOILED | 299 | P 1.000000 | 0.040000 | | 100.00 | 0.040000 |
| 53002MA | GOAT-LEAN | 25 COOKED-FRESH-FRIED | 299 | P 1.000000 | 0.040000 | | 100.00 | 0.040000 |
| 53003AA | HORSE | 00 NOT SPECIFIED | 299 | P 1.000000 | 0.150000 | | 100.00 | 0.150000 |
| 53005BA | SHEEP-MEAT BYP | 21 COOKED-NFS | 299 | P 1.000000 | 0.500000 | | 100.00 | 0.500000 |
| 53005BB | SHEEP-OTH ORGAN | 21 COOKED-NFS | 299 | P 1.000000 | 0.040000 | | 100.00 | 0.040000 |
| 53005FA | SHEEP-FAT | 21 COOKED-NFS | 299 | P 1.000000 | 0.500000 | | 100.00 | 0.500000 |
| 53005KA | SHEEP-KIDNEY | 21 COOKED-NFS | 299 | P 1.000000 | 0.040000 | | 100.00 | 0.040000 |
| 53005LA | SHEEP-LIVER | 00 NOT SPECIFIED | 299 | P 1.000000 | 0.030000 | | 100.00 | 0.030000 |
| 53005MA | SHEEP-LEAN | 21 COOKED-NFS | 299 | P 1.000000 | 0.050000 | | 100.00 | 0.050000 |
| 53005MA | SHEEP-LEAN | 31 COOKED-FRESH OR CANNED | 299 | P 1.000000 | 0.050000 | | 100.00 | 0.050000 |
| 53006BA | PORK-MEAT BYP | 21 COOKED-NFS | 299 | P 1.000000 | 0.060000 | | 100.00 | 0.060000 |
| 53006BB | PORK-OTH ORGAN | 21 COOKED-NFS | 299 | P 1.000000 | 0.020000 | | 100.00 | 0.020000 |

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# Table 1, continued

ANTICIPATED RESIDUE INFORMATION FOR CASWELL NUMBER 335 DATE: 07/19/89 PAGE: 2

| CHEMICAL | STUDY TYPE | EFFECTS | REFERENCE DOSES | DATA GAPS/COMMENTS | STATUS |
|---|---|---|---|---|---|
| Coumaphos | 2yr feeding- rat | Plasma ChE inhibition in | PADI UF -->100 | Chronic feeding - dog | HED complete 03/30/89. |
| Caswell #335 | NOEL= 0.0700 mg/kg | females. | OPP RfD= 0.000700 | Reproduction - rat | EPA deferred 04/20/89; |
| CAS No. 56-72-4 | 1.00 ppm | (Actual dose tested) | EPA RfD= 0.000000 | Oncogneicity - mouse | Pending RAC approval of |
| A.I. CODE: 036501 | LEL= 0.3600 mg/kg | | | | RAF ChE report. |
| CFR No. 180.189 | 5.00 ppm | No evidence of oncogenic- | | | WHO TADI withdrawn 1980; |
| | ONCO: Negative- 1 species. | ity in rat. | | | WHO last reviewed 1987. |

| FOOD CODE | FOOD | FOOD FORM | PET.# | TOLERANCE (ppm) | ANTICIPATED RESIDUE (ppm) | AR STATISTIC TYPE | % CROP TREATED | RES. VALUE USED IN TAS RUN (ppm) |
|---|---|---|---|---|---|---|---|---|
| 53006BB | PORK-OTH ORGAN | 26 COOKED-FRESH-PICKLED,CORNED,OR CURED | 299 | P 1.000000 | 0.020000 | | 100.00 | 0.020000 |
| 53006FA | PORK-FAT | 10 RAW-FRESH OR NFS | 299 | P 1.000000 | 0.060000 | | 100.00 | 0.060000 |
| 53006FA | PORK-FAT | 21 COOKED-NFS | 299 | P 1.000000 | 0.060000 | | 100.00 | 0.060000 |
| 53006FA | PORK-FAT | 23 COOKED-FRESH-BOILED | 299 | P 1.000000 | 0.060000 | | 100.00 | 0.060000 |
| 53006FA | PORK-FAT | 25 COOKED-FRESH-FRIED | 299 | P 1.000000 | 0.060000 | | 100.00 | 0.060000 |
| 53006FA | PORK-FAT | 26 COOKED-FRESH-PICKLED,CORNED,OR CURED | 299 | P 1.000000 | 0.060000 | | 100.00 | 0.060000 |
| 53006KA | PORK-KIDNEY | 21 COOKED-NFS | 299 | P 1.000000 | 0.020000 | | 100.00 | 0.020000 |
| 53006LA | PORK-LIVER | 21 COOKED-NFS | 299 | P 1.000000 | 0.020000 | | 100.00 | 0.020000 |
| 53006LA | PORK-LIVER | 25 COOKED-FRESH-FRIED | 299 | P 1.000000 | 0.020000 | | 100.00 | 0.020000 |
| 53006MA | PORK-LEAN | 21 COOKED-NFS | 299 | P 1.000000 | 0.030000 | | 100.00 | 0.030000 |
| 53006MA | PORK-LEAN | 25 COOKED-FRESH-FRIED | 299 | P 1.000000 | 0.030000 | | 100.00 | 0.030000 |
| 53006MA | PORK-LEAN | 26 COOKED-FRESH-PICKLED,CORNED,OR CURED | 299 | P 1.000000 | 0.030000 | | 100.00 | 0.030000 |
| 55008BA | TURKEY-BYP | 21 COOKED-NFS | 299 | P 1.000000 | 0.010000 | | 100.00 | 0.010000 |
| 55008BA | TURKEY-BYP | 26 COOKED-FRESH-PICKLED,CORNED,OR CURED | 299 | P 1.000000 | 0.010000 | | 100.00 | 0.010000 |
| 55008LA | TURKEY ORGAN | 21 COOKED-NFS | 299 | P 1.000000 | 0.010000 | | 100.00 | 0.010000 |
| 55008LA | TURKEY ORGAN | 25 COOKED-FRESH-FRIED | 299 | P 1.000000 | 0.010000 | | 100.00 | 0.010000 |
| 55008MA | TURKEY W/O SKIN | 21 COOKED-NFS | 299 | P 1.000000 | 0.060000 | | 100.00 | 0.060000 |
| 55008MA | TURKEY W/O SKIN | 31 COOKED-FRESH OR CANNED | 299 | P 1.000000 | 0.060000 | | 100.00 | 0.060000 |
| 55008MA | TURKEY W/O SKIN | 62 COOKED-FRESH OR FROZEN-BAKED | 299 | P 1.000000 | 0.060000 | | 100.00 | 0.060000 |
| 55008MB | TURKEY+SKIN | 21 COOKED-NFS | 299 | P 1.000000 | 0.060000 | | 100.00 | 0.060000 |
| 55008MB | TURKEY+SKIN | 25 COOKED-FRESH-FRIED | 299 | P 1.000000 | 0.060000 | | 100.00 | 0.060000 |
| 55008MC | TURKEY-UNSPEC | 21 COOKED-NFS | 299 | P 1.000000 | 0.060000 | | 100.00 | 0.060000 |
| 55013BA | POULTRY,OTH-BYP | 00 NOT SPECIFIED | 299 | P 1.000000 | 0.010000 | | 100.00 | 0.010000 |
| 55013LA | POULTRY,ORGAN | 25 COOKED-FRESH-FRIED | 299 | P 1.000000 | 0.010000 | | 100.00 | 0.010000 |
| 55013MA | POULTRY,OTHER | 21 COOKED-NFS | 299 | P 1.000000 | 0.010000 | | 100.00 | 0.010000 |
| 55014AA | EGGS-WHOLE | 10 RAW-FRESH OR NFS | 8F0678 | P 0.100000 | 0.020000 | | 100.00 | 0.020000 |
| 55014AA | EGGS-WHOLE | 21 COOKED-NFS | 8F0678 | P 0.100000 | 0.020000 | | 100.00 | 0.020000 |
| 55014AA | EGGS-WHOLE | 22 COOKED-FRESH-BAKED | 8F0678 | P 0.100000 | 0.020000 | | 100.00 | 0.020000 |
| 55014AA | EGGS-WHOLE | 23 COOKED-FRESH-BOILED | 8F0678 | P 0.100000 | 0.020000 | | 100.00 | 0.020000 |
| 55014AA | EGGS-WHOLE | 25 COOKED-FRESH-FRIED | 8F0678 | P 0.100000 | 0.020000 | | 100.00 | 0.020000 |
| 55014AB | EGGS-WHITE ONLY | 10 RAW-FRESH OR NFS | 8F0678 | P 0.100000 | 0.020000 | | 100.00 | 0.020000 |
| 55014AB | EGGS-WHITE ONLY | 21 COOKED-NFS | 8F0678 | P 0.100000 | 0.020000 | | 100.00 | 0.020000 |
| 55014AB | EGGS-WHITE ONLY | 22 COOKED-FRESH-BAKED | 8F0678 | P 0.100000 | 0.020000 | | 100.00 | 0.020000 |
| 55014AB | EGGS-WHITE ONLY | 62 COOKED-FRESH OR FROZEN-BAKED | 8F0678 | P 0.100000 | 0.020000 | | 100.00 | 0.020000 |
| 55014AB | EGGS-WHITE ONLY | 81 COOKED-FROZEN | 8F0678 | P 0.100000 | 0.020000 | | 100.00 | 0.020000 |
| 55014AC | EGGS-YOLK ONLY | 10 RAW-FRESH OR NFS | 8F0678 | P 0.100000 | 0.020000 | | 100.00 | 0.020000 |
| 55014AC | EGGS-YOLK ONLY | 21 COOKED-NFS | 8F0678 | P 0.100000 | 0.020000 | | 100.00 | 0.020000 |
| 55014AC | EGGS-YOLK ONLY | 25 COOKED-FRESH-FRIED | 8F0678 | P 0.100000 | 0.020000 | | 100.00 | 0.020000 |
| 55014AC | EGGS-YOLK ONLY | 31 COOKED-FRESH OR CANNED | 8F0678 | P 0.100000 | 0.020000 | | 100.00 | 0.020000 |
| 55015BA | CHICKEN-BYP | 00 NOT SPECIFIED | 299 | P 1.000000 | 0.010000 | | 100.00 | 0.010000 |

# Table 1, continued

ANTICIPATED RESIDUE INFORMATION FOR CASWELL NUMBER 335 DATE: 07/19/89 PAGE: 3

| CHEMICAL | STUDY TYPE | EFFECTS | REFERENCE DOSES | DATA GAPS/COMMENTS | STATUS |
|---|---|---|---|---|---|
| Coumaphos<br>Caswell #335<br>CAS No. 56-72-4<br>A.I. CODE: 036501<br>CFR No. 180.189 | 2yr feeding- rat<br>NOEL= 0.0700 mg/kg<br>1.00 ppm<br>LEL= 0.3600 mg/kg<br>5.00 ppm<br>ONCO: Negative- 1 species. | Plasma ChE inhibition in females.<br>(Actual dose tested)<br>No evidence of oncogenicity in rat. | PADI UF -->100<br>OPP RfD= 0.000700<br>EPA RfD= 0.000000 | Chronic feeding - dog<br>Reproduction - rat<br>Oncogneicity - mouse | HED complete 03/30/89.<br>EPA deferred 04/20/89;<br>Pending RAC approval of RAF ChE report.<br>WHO TADI withdrawn 1980;<br>WHO last reviewed 1987. |

| FOOD CODE | FOOD | FOOD FORM | PET.# | TOLERANCE (ppm) | ANTICIPATED RESIDUE (ppm) | AR STATISTIC TYPE | % CROP TREATED | RES. VALUE USED IN TAS RUN (ppm) |
|---|---|---|---|---|---|---|---|---|
| 55015LA | CHICKEN-ORGAN | 21 COOKED-NFS | 299 | P 1.000000 | 0.010000 | | 100.00 | 0.010000 |
| 55015LA | CHICKEN-ORGAN | 25 COOKED-FRESH-FRIED | 299 | P 1.000000 | 0.010000 | | 100.00 | 0.010000 |
| 55015LA | CHICKEN-ORGAN | 26 COOKED-FRESH-PICKLED,CORNED,OR CURED | 299 | P 1.000000 | 0.010000 | | 100.00 | 0.010000 |
| 55015MA | CHICKEN-W/O SKIN | 21 COOKED-NFS | 299 | P 1.000000 | 0.060000 | | 100.00 | 0.060000 |
| 55015MA | CHICKEN-W/O SKIN | 22 COOKED-FRESH-BAKED | 299 | P 1.000000 | 0.060000 | | 100.00 | 0.060000 |
| 55015MA | CHICKEN-W/O SKIN | 25 COOKED-FRESH-FRIED | 299 | P 1.000000 | 0.060000 | | 100.00 | 0.060000 |
| 55015MA | CHICKEN-W/O SKIN | 31 COOKED-FRESH OR CANNED | 299 | P 1.000000 | 0.060000 | | 100.00 | 0.060000 |
| 55015MA | CHICKEN-W/O SKIN | 53 COOKED-CANNED-BOILED | 299 | P 1.000000 | 0.060000 | | 100.00 | 0.060000 |
| 55015MP | CHICKEN+SKIN | 21 COOKED-NFS | 299 | P 1.000000 | 0.060000 | | 100.00 | 0.060000 |
| 55015MP | CHICKEN+SKIN | 25 COOKED-FRESH-FRIED | 299 | P 1.000000 | 0.060000 | | 100.00 | 0.060000 |

Table 1a: 95th Percentile or Maximum Residues
Used in the Acute Exposure Analysis

| Food Code | Antic. Res | Abbrev Food Name |
|---|---|---|
| 50000FA10 | 0.0200 | MILK-FAT SOLIDS |
| 50000FA21 | 0.0200 | MILK-FAT SOLIDS |
| 50000FA51 | 0.0200 | MILK-FAT SOLIDS |
| 53001BA21 | 0.4000 | BEEF-MEAT BYP |
| 53001BA26 | 0.4000 | BEEF-MEAT BYP |
| 53001BB21 | 0.1000 | BEEF-OTH ORGAN |
| 53001BB51 | 0.1000 | BEEF-OTH ORGAN |
| 53001DA21 | 0.0500 | BEEF-DRIED |
| 53001FA10 | 0.4000 | BEEF-FAT |
| 53001FA21 | 0.4000 | BEEF-FAT |
| 53001FA22 | 0.4000 | BEEF-FAT |
| 53001FA23 | 0.4000 | BEEF-FAT |
| 53001FA24 | 0.4000 | BEEF-FAT |
| 53001FA25 | 0.4000 | BEEF-FAT |
| 53001KA21 | 0.0400 | BEEF-KIDNEY |
| 53001LA25 | 0.1000 | BEEF-LIVER |
| 53001LA31 | 0.1000 | BEEF-LIVER |
| 53001MA10 | 0.0500 | BEEF-LEAN |
| 53001MA21 | 0.0500 | BEEF-LEAN |
| 53001MA22 | 0.0500 | BEEF-LEAN |
| 53001MA23 | 0.0500 | BEEF-LEAN |
| 53001MA24 | 0.0500 | BEEF-LEAN |
| 53002BA00 | 1.0000 | GOAT-MEAT BYP |
| 53002BB00 | 0.0300 | GOAT-OTH ORGAN |
| 53002FA23 | 1.0000 | GOAT-FAT |
| 53002FA25 | 1.0000 | GOAT-FAT |
| 53002KA00 | 0.0300 | GOAT-KIDNEY |
| 53002LA00 | 0.0300 | GOAT-LIVER |
| 53002MA23 | 0.2000 | GOAT-LEAN |
| 53002MA25 | 0.2000 | GOAT-LEAN |
| 53003AA00 | 0.4000 | HORSE |
| 53005BA21 | 1.0000 | SHEEP-MEAT BYP |
| 53005BB21 | 0.0900 | SHEEP-OTH ORGAN |
| 53005FA21 | 1.0000 | SHEEP-FAT |
| 53005KA21 | 0.0900 | SHEEP-KIDNEY |
| 53005LA00 | 0.0900 | SHEEP-LIVER |

Table 1a: 95th Percentile or Maximum Residues Used in the Acute Exposure Analysis, con't

| Food Code | Antic. Res | Abbrev Food Name |
|---|---|---|
| 53005MA21 | 0.2500 | SHEEP-LEAN |
| 53005MA31 | 0.2500 | SHEEP-LEAN |
| 53006BA21 | 0.6000 | PORK-MEAT BYP |
| 53006BB21 | 0.0200 | PORK-OTH ORGAN |
| 53006BB26 | 0.0200 | PORK-OTH ORGAN |
| 53006FA10 | 0.6000 | PORK-FAT |
| 53006FA21 | 0.6000 | PORK-FAT |
| 53006FA23 | 0.6000 | PORK-FAT |
| 53006FA25 | 0.6000 | PORK-FAT |
| 53006FA26 | 0.6000 | PORK-FAT |
| 53006KA21 | 0.0200 | PORK-KIDNEY |
| 53006LA21 | 0.0200 | PORK-LIVER |
| 53006LA25 | 0.0200 | PORK-LIVER |
| 53006MA21 | 0.2000 | PORK-LEAN |
| 53006MA25 | 0.2000 | PORK-LEAN |
| 53006MA26 | 0.2000 | PORK-LEAN |
| 55008BA21 | 0.0300 | TURKEY-BYP |
| 55008BA26 | 0.0300 | TURKEY-BYP |
| 55008LA21 | 0.0300 | TURKEY ORGAN |
| 55008LA25 | 0.0300 | TURKEY ORGAN |
| 55008MA21 | 0.6000 | TURKEY W/O SKIN |
| 55008MA31 | 0.6000 | TURKEY W/O SKIN |
| 55008MA62 | 0.6000 | TURKEY W/O SKIN |
| 55008MB21 | 0.6000 | TURKEY+SKIN |
| 55008MB25 | 0.6000 | TURKEY+SKIN |
| 55008MC21 | 0.6000 | TURKEY-UNSPEC |
| 55013BA00 | 0.0300 | POULTRY,OTH-BYP |
| 55013LA25 | 0.0300 | POULTRY,ORGAN |
| 55013MA21 | 0.0300 | POULTRY,OTHER |
| 55014AA10 | 0.0800 | EGGS-WHOLE |
| 55014AA21 | 0.0800 | EGGS-WHOLE |
| 55014AA22 | 0.0800 | EGGS-WHOLE |
| 55014AA23 | 0.0800 | EGGS-WHOLE |
| 55014AA25 | 0.0800 | EGGS-WHOLE |
| 55014AB10 | 0.0800 | EGGS-WHITE ONLY |
| 55014AB21 | 0.0800 | EGGS-WHITE ONLY |

Table 1a: 95th Percentile or Maximum Residues Used in the Acute Exposure Analysis, con't

| Food Code | Antic. Res | Abbrev Food Name |
|---|---|---|
| 55014AB22 | 0.0800 | EGGS-WHITE ONLY |
| 55014AB62 | 0.0800 | EGGS-WHITE ONLY |
| 55014AB81 | 0.0800 | EGGS-WHITE ONLY |
| 55014AC10 | 0.0800 | EGGS-YOLK ONLY |
| 55014AC21 | 0.0800 | EGGS-YOLK ONLY |
| 55014AC25 | 0.0800 | EGGS-YOLK ONLY |
| 55014AC31 | 0.0800 | EGGS-YOLK ONLY |
| 55015BA00 | 0.0300 | CHICKEN-BYP |
| 55015LA21 | 0.0300 | CHICKEN-ORGAN |
| 55015LA25 | 0.0300 | CHICKEN-ORGAN |
| 55015LA26 | 0.0300 | CHICKEN-ORGAN |
| 55015MA21 | 0.6000 | CHICKEN-W/O SKIN |
| 55015MA22 | 0.6000 | CHICKEN-W/O SKIN |
| 55015MA25 | 0.6000 | CHICKEN-W/O SKIN |
| 55015MA31 | 0.6000 | CHICKEN-W/O SKIN |
| 55015MA53 | 0.6000 | CHICKEN-W/O SKIN |
| 55015MB21 | 0.6000 | CHICKEN+SKIN |
| 55015MB25 | 0.6000 | CHICKEN+SKIN |

# Table 2

TOLERANCE ASSESSMENT SYSTEM ROUTINE CHRONIC ANALYSIS DATE: 07/19/89 PAGE: 1

| CHEMICAL INFORMATION | STUDY TYPE | EFFECTS | REFERENCE DOSES | DATA GAPS/COMMENTS | STATUS |
|---|---|---|---|---|---|
| Coumaphos | 2yr feeding - rat | Plasma ChE inhibition in | PADI UF -->100 | Chronic feeding - dog | HED complete 03/30/89. |
| Caswell #335 | NOEL= 0.0700 mg/kg | females. | OPP RfD= 0.000700 | Reproduction - rat | EPA deferred 04/20/89; |
| CAS No. 56-72-4 | 1.00 ppm | (Actual dose tested) | EPA RfD= 0.000000 | Oncogneicity - mouse | Pending RAC approval of |
| A.I. CODE: 036501 | LEL= 0.3600 mg/kg | | | | RAF ChE report. |
| CFR No. 180.189 | 5.00 ppm | No evidence of oncogenic- | | | WHO TADI withdrawn 1980; |
| | ONCO: Negative- 1 species. | ity in rat. | | | WHO last reviewed 1987. |

| POPULATION SUBGROUP | TOTAL TMRC (MG/KG BODY WEIGHT/DAY) CURRENT TMRC* | NEW TMRC** | NEW TMRC AS PERCENT OF RFD | DIFFERENCE AS PERCENT OF RFD | EFFECT OF ANTICIPATED RESIDUES ARC | %RFD |
|---|---|---|---|---|---|---|
| U.S. POPULATION - 48 STATES | 0.003011 | 0.003011 | 430.190571 | 0.000000 | 0.000169 | 24.12257 |
| U.S. POPULATION - SPRING SEASON | 0.003000 | 0.003000 | 428.584429 | 0.000000 | 0.000169 | 24.09471 |
| U.S. POPULATION - SUMMER SEASON | 0.003047 | 0.003047 | 435.254714 | 0.000000 | 0.000172 | 24.51114 |
| U.S. POPULATION - FALL SEASON | 0.003046 | 0.003046 | 435.089571 | 0.000000 | 0.000170 | 24.33229 |
| U.S. POPULATION - WINTER SEASON | 0.002953 | 0.002953 | 421.832000 | 0.000000 | 0.000165 | 23.55271 |
| NORTHEAST REGION | 0.003066 | 0.003066 | 438.026286 | 0.000000 | 0.000172 | 24.58343 |
| NORTH CENTRAL REGION | 0.003027 | 0.003027 | 432.417143 | 0.000000 | 0.000166 | 23.73214 |
| SOUTHERN REGION | 0.002970 | 0.002970 | 424.293857 | 0.000000 | 0.000168 | 23.99414 |
| WESTERN REGION | 0.002986 | 0.002986 | 426.570714 | 0.000000 | 0.000170 | 24.29657 |
| HISPANICS | 0.003729 | 0.003729 | 532.708714 | 0.000000 | 0.000212 | 30.23271 |
| NON-HISPANIC WHITES | 0.002916 | 0.002916 | 416.523429 | 0.000000 | 0.000163 | 23.25157 |
| NON-HISPANIC BLACKS | 0.003238 | 0.003238 | 462.603143 | 0.000000 | 0.000186 | 26.50714 |
| NON-HISPANIC OTHERS | 0.003468 | 0.003468 | 495.496571 | 0.000000 | 0.000191 | 27.22614 |
| NURSING INFANTS (< 1 YEAR OLD) | 0.001835 | 0.001835 | 262.130286 | 0.000000 | 0.000088 | 12.62900 |
| NON-NURSING INFANTS (< 1 YEAR OLD) | 0.003972 | 0.003972 | 567.466429 | 0.000000 | 0.000183 | 26.17029 |
| FEMALES (13+ YEARS, PREGNANT) | 0.002119 | 0.002119 | 302.680429 | 0.000000 | 0.000115 | 16.42786 |
| FEMALES 13+ YEARS, NURSING | 0.002221 | 0.002221 | 317.285714 | 0.000000 | 0.000126 | 18.01486 |
| CHILDREN (1-6 YEARS OLD) | 0.005846 | 0.005846 | 835.109143 | 0.000000 | 0.000322 | 46.04471 |
| CHILDREN (7-12 YEARS OLD) | 0.004222 | 0.004222 | 603.100286 | 0.000000 | 0.000233 | 33.25143 |
| MALES (13-19 YEARS OLD) | 0.003276 | 0.003276 | 468.040714 | 0.000000 | 0.000181 | 25.89671 |
| FEMALES (13-19 YEARS OLD, NOT PREG. OR NURSING) | 0.002625 | 0.002625 | 375.022000 | 0.000000 | 0.000146 | 20.80314 |
| MALES (20 YEARS AND OLDER) | 0.002682 | 0.002682 | 383.128429 | 0.000000 | 0.000153 | 21.79029 |
| FEMALES (20 YEARS AND OLDER, NOT PREG. OR NURS) | 0.002208 | 0.002208 | 315.429429 | 0.000000 | 0.000127 | 18.13914 |

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

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Table 3: Acute Exposure Summary for Coumaphos

| | % User Days | Mean Daily Residue Contribution per User Day | |
|---|---|---|---|
| | | MG/KG/DAY | Average MOS |
| U.S. Population: | 99.7 | 0.000798 | 6300 |
| Infants: | 89.3 | 0.001059 | 4700 |
| Children: | 99.9 | 0.001563 | 3200 |
| Females: | 99.8 | 0.000613 | 8200 |
| Males: | 99.9 | 0.000725 | 6900 |

Estimated % of user days with residue contribution exceeding the exposure X in UG/KG, where X =

| | 0 | 0.001 | 0.002 | 0.003 | 0.004 | 0.005 | 0.006 | 0.007 | 0.008 | 0.009 | 0.01 | 0.015 | 0.02 | 0.025 | 0.05 | 0.075 | 0.1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| U.S. Population: | 100 | 26 | 7 | 3 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Infants: | 100 | 31 | 18 | 11 | 6 | 4 | 2 | 2 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Children: | 100 | 54 | 25 | 13 | 7 | 4 | 2 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Females: | 100 | 18 | 3 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Males: | 100 | 23 | 5 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| MOS | | 5000 | 2500 | 1667 | 1250 | 1000 | 833 | 715 | 625 | 556 | 500 | 333 | 250 | 200 | 100 | 67 | 50 |

NOTE: The distributions shown above represent the exposure encountered by people who consume food containing coumaphos residues at levels specified in the accompanying memorandum and tables.