



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

WASHINGTON, D.C. 20460

OFFICE OF
PREVENTION, PESTICIDES
AND TOXIC SUBSTANCES

MEMORANDUM

DATE: 8-JUNE-2007

SUBJECT: **Pyrasulfotole.** Acute and Chronic Dietary Exposure and Risk Assessments for Section 3 Registration on Small Cereal Grains. DP# 333435. Decision # 366490. Chemical: 000692.

FROM/TO: Jennifer R. Tyler, Chemist
Registration Action Branch (RAB1)
Health Effects Division (HED) (7509C)

THROUGH: PV Shah, Ph.D., Branch Senior Scientist
RAB1/HED (7509C)

and

David Hrdy, Sr. Biologist
Christina Swartz, Chemist
Dietary Exposure Science Advisory Council (DESAC)/HED (7509C)

Executive Summary

Acute and chronic dietary (food and drinking water) exposure analyses were requested in order to determine the dietary exposure estimates associated with the HED-recommended tolerances for residues of the herbicide pyrasulfotole in/on small cereal grains and livestock commodities. No cancer dietary exposure assessment was performed because pyrasulfotole is not carcinogenic.

An unrefined, acute dietary exposure assessment was performed for the general U.S. population and all other population subgroups (including infants and children) using tolerance-level residues and assuming 100% crop treated (CT) for all proposed uses. Drinking water was incorporated directly into the dietary assessment using the acute concentration for surface water generated by the FQPA Index Reservoir Screening Tool (FIRST) model. The results of this assessment indicate that the acute dietary exposure estimates (95th percentile) are below HED's level of concern [$<100\%$ of the acute Population Adjusted Dose (aPAD)] for the general U.S. population (2% of the aPAD) and all other populations subgroups. The most highly exposed population subgroup is children 1-2 years old at 4% of the cPAD.

An unrefined, chronic dietary exposure assessment was performed for the general U.S. population and various population subgroups using tolerance-level residues and assuming 100% CT for all proposed uses. Drinking water was incorporated directly into the dietary assessment using the chronic concentration for surface water generated by the FIRST model. The results of the assessment concludes that the chronic dietary exposure estimates are below HED's level of concern [$<100\%$ of the chronic Population Adjusted Dose (cPAD)] for the general U.S. population (2% of the cPAD) and all population subgroups. The most highly exposed population subgroup is children 1-2 years old at 7% of the cPAD.

Introduction

Dietary risk assessment incorporates both exposure and toxicity of a given pesticide. For acute and chronic assessments, the risk is expressed as a percentage of a maximum acceptable dose. This is the PAD, which HED has concluded will result in no unreasonable adverse health effects. The PAD is the reference dose (RfD) divided by the FQPA 10x Safety Factor. Dietary risk is expressed as a percentage of the PAD. HED is concerned when estimated dietary risk exceeds 100% of the PAD. References which discuss the acute and chronic risk assessment in more detail are available on the EPA/pesticides web site: "Available Information on Assessing Exposure from Pesticides, A User's Guide", 6/21/2000, web link: http://www.epa.gov/fedrgstr/EPA_PEST/2000/July/Day_12/6061.pdf; or see SOP 99.6 (8/20/99). The current acute and chronic dietary exposure assessments were conducted using the Dietary Exposure Evaluation Model software with the Food Commodity Intake Database (DEEM-FCID™, Version 2.03). This is the first dietary exposure assessment for pyrasulfotole.

Residue Information

Proposed Tolerances: The available residue chemistry database supports the establishment of permanent tolerances for the combined residues of pyrasulfotole and pyrasulfotole-desmethyl in/on the following raw agricultural and livestock commodities:

Wheat, grain	0.02 ppm	Cattle, liver	0.35 ppm
Wheat, straw	0.20 ppm	Goat, meat	0.02 ppm
Wheat, forage	0.20 ppm	Goat, fat	0.02 ppm
Wheat, hay	0.80 ppm	Goat, meat byproducts, except liver	0.06 ppm
Aspirated grain fractions	0.40 ppm	Goat, liver	0.35 ppm
Oat, grain	0.08 ppm	Sheep, meat	0.02 ppm
Oat, straw	0.20 ppm	Sheep, fat	0.02 ppm
Oat, forage	0.10 ppm	Sheep, meat byproducts, except liver	0.06 ppm
Oat, hay	0.50 ppm	Sheep, liver	0.35 ppm
Barley, grain	0.02 ppm	Horse, meat byproducts, except liver	0.05 ppm
Barley, straw	0.20 ppm	Horse, liver	0.30 ppm
Barley, hay	0.30 ppm	Hog, meat	0.02 ppm
Rye, grain	0.02 ppm	Hog, fat	0.02 ppm
Rye, straw	0.20 ppm	Hog, meat byproducts	0.02 ppm
Rye, forage	0.20 ppm	Poultry, meat	0.02 ppm
Milk	0.01 ppm	Poultry, fat	0.02 ppm

Cattle, meat	0.02 ppm	Poultry, meat byproducts	0.02 ppm
Cattle, fat	0.02 ppm	Eggs	0.02 ppm
Cattle, meat byproducts, except liver	0.06 ppm		

Nature of the Residue:

Plants: Based on the results of the wheat metabolism studies, pyrasulfotole and pyrasulfotole-desmethyl are the residues of concern for tolerances and risk assessment purposes (Memo, J. Tyler et al., 06/08/07; D328640). This conclusion applies only to the use of pyrasulfotole on small cereal grains. Any future uses on other crops, such as leafy vegetables, or legumes, may require the submission of additional metabolism data.

Livestock: Based on the results of the dairy cattle and laying hen metabolism studies, the residues of concern in livestock for tolerance and risk assessment purposes are parent and the desmethyl metabolite (Memo, J. Tyler et al., 06/08/07; D328640).

Drinking Water: The residues of concern in drinking water for risk assessment purposes are parent only (Memo, J. Tyler et al., 06/08/07; D328640).

Drinking Water Considerations: The Environmental Fate and Effects Division (EFED) provided Estimated Drinking Water Concentrations (EDWCs) of pyrasulfotole in surface and ground water using the FIRST and Screening Concentration in Ground Water (SCI-GROW) models, respectively. The assessment was based on the proposed small cereal grain use, which has a maximum proposed seasonal application rate of 0.045 lb ai/A. EFED calculated the 1- in 10-year peak acute and 1- in 10-year estimated annual mean non-cancer chronic EDWCs for pyrasulfotole in surface water to be 4.0 ppb and 2.8 ppb, respectively. The ground water EDWC for both acute and chronic exposures is estimated as 1.4 ppb.

Percent Crop Treated: For the acute and chronic assessments, it was assumed that 100% of the proposed crops have been treated with pyrasulfotole.

Residue and PDP Data: HED-recommended tolerance level residues were used for all proposed commodities in the acute and chronic assessments.

Processing Factors: The results of the wheat processing study indicate that residues of pyrasulfotole and pyrasulfotole-desmethyl do not appear to concentrate in wheat flour (0.26x), middling (0.38x), shorts (0.56x) and germ (0.70x). Total residues of pyrasulfotole and pyrasulfotole-desmethyl do appear to concentrate in aspirated wheat grain fractions (33x), and wheat bran (1.6x). Based on these processing factors and a highest-average field trial (HAFT) residue of 0.011 ppm from the wheat field trials, a separate tolerance is not needed for wheat, bran, but a tolerance should be established for aspirated grain fractions at 0.40 ppm. In addition, based on the results of the processed food/feed data on wheat, HED concludes that residues of pyrasulfotole and pyrasulfotole-desmethyl are not expected to concentrate in pearled barley, barley flour, oat flour, groats/rolled oats, and rye flour. Therefore, tolerances on these processed commodities are not needed. Because the results of the processing study indicate that residues concentrated in wheat bran, residues can be expected to concentrate in barley bran, oat bran and rye bran as well. Based on the 1.6x processing factor for wheat bran, and a HAFT residue of

0.010 ppm from the barley field trials, the maximum expected residues in barley bran would be 0.016 ppm, which is below the recommended 0.02 ppm tolerance for barley, grain. Therefore, a separate tolerance is not needed for barley, bran. Based on the 1.6x processing factor for wheat bran, and a HAFT residue of 0.109 ppm from the oat field trials, the maximum expected residues in oat bran would be 0.17 ppm, which is above the recommended 0.08 ppm tolerance for oat, grain. Therefore, a separate tolerance should be established for oat, bran at 0.20 ppm. However, according to current HED guidelines, HED does not currently set tolerances on oat, bran. The residue level will be incorporated into the dietary exposure assessment. Based on the 1.6x processing factor for wheat bran, and a HAFT residue of 0.011 ppm from the wheat field trials, the maximum expected residues in rye bran would be 0.018 ppm, which is below the recommended 0.02 ppm tolerance for rye, grain. Therefore, a separate tolerance is not needed for wheat, bran.

DEEM-FCID™ Program and Consumption Information

The pyrasulfotole acute and chronic dietary exposure assessments were conducted using DEEM-FCID™ (Version 2.03), which incorporates consumption data from USDA's CSFII, 1994-1996 and 1998. The 1994-96, 98 data are based on the reported consumption of more than 20,000 individuals over two non-consecutive survey days. Foods "as consumed" (e.g., apple pie) are linked to EPA-defined food commodities (e.g. apples, peeled fruit - cooked; fresh or N/S; baked; or wheat flour - cooked; fresh or N/S, baked) using publicly available recipe translation files developed jointly by USDA/ARS and EPA. Consumption data are averaged for the entire U.S. population and within population subgroups for chronic exposure assessment, but are retained as individual consumption events for acute exposure assessment.

For chronic exposure and risk assessment, an estimate of the residue level in each food or food-form (e.g., orange or orange juice) on the food commodity residue list is multiplied by the average daily consumption estimate for that food/food form. The resulting residue consumption estimate for each food/food form is summed with the residue consumption estimates for all other food/food forms on the commodity residue list to arrive at the total average estimated exposure. Exposure is expressed in mg/kg body weight/day and as a percent of the cPAD. This procedure is performed for each population subgroup.

For acute exposure assessments, individual one-day food consumption data are used on an individual-by-individual basis. The reported consumption amounts of each food item can be multiplied by a residue point estimate and summed to obtain a total daily pesticide exposure for a deterministic (Tier 1 or Tier 2) exposure assessment, or "matched" in multiple random pairings with residue values and then summed in a probabilistic (Tier 3/4) assessment. The resulting distribution of exposures is expressed as a percentage of the aPAD on both a user (i.e., those who reported eating relevant commodities/food forms) and a per-capita (i.e., those who reported eating the relevant commodities as well as those who did not) basis. In accordance with HED policy, per capita exposure and risk are reported for all tiers of analysis. However, for Tiers 1 and 2, significant differences in user vs. per capita exposure and risk are identified and noted in the risk assessment.

Toxicological Information

A summary of the toxicological doses and endpoints selected for dietary exposure assessment is provided in Table 1.

Table 1. Summary of Toxicological Doses and Endpoints for Pyrasulfotole for Use in Dietary Human Health Risk Assessments.				
Exposure Scenario	Point of Departure	Uncertainty/FQPA Safety Factors	RfD, PAD, Level of Concern for Risk Assessment	Study and Relevant Toxicological Effects
Acute Dietary (All populations)	NOAEL = 3.8 mg/kg/day	UF _A = 10X UF _H = 10X UF _{FQPA} = 1X	aRfD = aPAD = 0.038 mg/kg/day	Developmental neurotoxicity (rat; dietary) Offspring LOAEL = 37 mg/kg/day based on delayed preputial separation (males), decreased cerebrum length (PND 21 females), and decreased cerebellum height (PND 21 males)
Chronic Dietary (All populations)	NOAEL = 1.0 mg/kg/day	UF _A = 10X UF _H = 10X UF _{FQPA} = 1X	cRfD = cPAD = 0.01mg/kg/day	Combined chronic toxicity/carcinogenicity (rat; dietary) LOAEL = 10/14 mg/kg/day (M/F) based on corneal opacity, neovascularization of the cornea, inflammation of the cornea, regenerative corneal hyperplasia, corneal atrophy, and/or retinal atrophy (both sexes), and hepatocellular hypertrophy along with increased serum cholesterol (males)
Cancer (oral, dermal, inhalation)	Classification: “Suggestive Evidence of Carcinogenic Potential” based on increased incidences of corneal tumors in male rats (carcinogenicity study) and urinary bladder tumors in male and female mice (carcinogenicity study)			

¹ UF = uncertainty factor, UF_A = extrapolation from animal to human (interspecies), UF_H = potential variation in sensitivity among members of the human population (intraspecies), UF_{FQPA} = FQPA Safety Factor, NOAEL = no observed adverse effect level, LOAEL = lowest observed adverse effect level, RfD = reference dose (a = acute, c = chronic), PAD = population adjusted dose.

Results/Discussion/Conclusions

HED's level of concern is when the exposure is greater than 100% of the PAD. That is, estimated exposures above this level are of concern, while estimated exposures at or below this level are not of concern. The DEEM-FCID™ analysis estimates the dietary exposure of the U.S. population and 26 population subgroups. The results reported in Table 2 are for the U.S. Population, all infants (<1 year old), children 1-2, children 3-5, children 6-12, youth 13-19, females 13-49, males 20-49, and adults 50+ years.

An acute dietary exposure assessment (using tolerance level residues and 100% CT information for all proposed uses) was conducted for the general U.S. population and various population subgroups (including infants and children). Drinking water was incorporated directly in the

dietary assessments using the acute concentration for surface water generated by the FIRST model. The results of the acute assessment indicate that the acute dietary exposure estimates (95th percentile) are below HED's level of concern (<100% of the aPAD) for the general U.S. population (2% of the aPAD) and all populations subgroups. The most highly exposed population subgroup is children 1-2 years old at 4% of the cPAD.

The chronic dietary exposure assessment (using tolerance level residues and 100% CT information for all proposed uses) was conducted for the general U.S. population and various population subgroups. Drinking water was incorporated directly into the dietary assessment using the chronic concentration for surface water generated by the FIRST model. The results of the chronic assessment indicate that the chronic dietary exposure estimates are below HED's level of concern (<100% of the cPAD) for the general U.S. population (2% of the cPAD) and all population subgroups. The most highly exposed population subgroup is children 1-2 years old at 7% of the cPAD.

Table 2. Summary of Dietary Exposure and Risk for Pyrasulfotole.

Population Subgroup	Acute Dietary ¹		Chronic Dietary ²	
	Dietary Exposure (mg/kg/day)	% aPAD	Dietary Exposure (mg/kg/day)	% cPAD
U.S. Population (total)	0.000633	2	0.000224	2
All Infants (< 1 year old)	0.001259	3	0.000410	4
Children 1-2 years old	0.001393	4	0.000698	7
Children 3-5 years old	0.001053	3	0.000541	5
Children 6-12 years old	0.000691	2	0.000339	3
Youth 13-19 years old	0.000431	1	0.000190	2
Adults 20-49 years old	0.000378	1	0.000168	2
Adults 50+ years old	0.000331	1	0.000160	2
Females 13-49 years old	0.000368	1	0.000161	2

¹ Acute dietary endpoint of 0.038 mg/kg/day applies to the general U.S. population and all population subgroups.

² Chronic dietary endpoint of 0.01 mg/kg/day applies to the general U.S. population and all population subgroups.

List of Attachments

Attachment 1. Residue File for Acute DEEM-FCID™ Analysis – All Populations.

Attachment 2. Acute DEEM-FCID™ Analysis – All Populations.

Attachment 3. Residue File for Chronic DEEM-FCID™ Analysis.

Attachment 4. Chronic DEEM-FCID™ Analysis.

cc (w/ Attachments): J. Tyler, T. White (RD, 7505P); D. Kenny (RD; 7505P)
RDI: DE SAC [C. Swartz (5/30/07), D. Hrdy (5/23/07)]; G. Kramer (06/08/07)
J.Tyler:S-10943:(703)305-5564: 7509C:RAB1

Attachment 1. Residue File for Acute DEEM-FCID™ Analysis – All Populations.

Filename: C:\Documents and Settings\jtyler\My Documents\JenWork\Pyrasulfatole\DEEM\000692a.R98
 Chemical: Pyrasulfatole
 RfD(Chronic): .01 mg/kg bw/day NOEL(Chronic): 1 mg/kg bw/day
 RfD(Acute): .038 mg/kg bw/day NOEL(Acute): 3.8 mg/kg bw/day
 Date created/last modified: 06-06-2007/13:33:06/8 Program ver. 2.03
 Comment: Proposed use on small cereal grains. FQPA Safety Factor=1x; therefore, aRfD=aPAD and cRfD=cPAD.

EPA Code	Crop Grp	Commodity Name	Def Res (ppm)	Adj.Factors #1	Adj.Factors #2	Comment
15000250	15	Barley, pearled barley	0.020000	1.000	1.000	
15000251	15	Barley, pearled barley-babyfood	0.020000	1.000	1.000	
15000260	15	Barley, flour	0.020000	1.000	1.000	
15000261	15	Barley, flour-babyfood	0.020000	1.000	1.000	
15000270	15	Barley, bran	0.020000	1.000	1.000	
21000440	M	Beef, meat	0.020000	1.000	1.000	
21000441	M	Beef, meat-babyfood	0.020000	1.000	1.000	
21000450	M	Beef, meat, dried	0.020000	1.000	1.000	
21000460	M	Beef, meat byproducts	0.060000	1.000	1.000	
21000461	M	Beef, meat byproducts-babyfood	0.060000	1.000	1.000	
21000470	M	Beef, fat	0.020000	1.000	1.000	
21000471	M	Beef,fat-babyfood	0.020000	1.000	1.000	
21000480	M	Beef, kidney	0.060000	1.000	1.000	
21000490	M	Beef, liver	0.350000	1.000	1.000	
21000491	M	Beef, liver-babyfood	0.350000	1.000	1.000	
40000930	P	Chicken, meat	0.020000	1.000	1.000	
40000931	P	Chicken, meat-babyfood	0.020000	1.000	1.000	
40000940	P	Chicken, liver	0.020000	1.000	1.000	
40000950	P	Chicken, meat byproducts	0.020000	1.000	1.000	
40000951	P	Chicken, meat byproducts-babyfoo	0.020000	1.000	1.000	
40000960	P	Chicken, fat	0.020000	1.000	1.000	
40000961	P	Chicken, fat-babyfood	0.020000	1.000	1.000	
40000970	P	Chicken, skin	0.020000	1.000	1.000	
40000971	P	Chicken, skin-babyfood	0.020000	1.000	1.000	
70001450	P	Egg, whole	0.020000	1.000	1.000	
70001451	P	Egg, whole-babyfood	0.020000	1.000	1.000	
70001460	P	Egg, white	0.020000	1.000	1.000	
70001461	P	Egg, white (solids)-babyfood	0.020000	1.000	1.000	
70001470	P	Egg, yolk	0.020000	1.000	1.000	
70001471	P	Egg, yolk-babyfood	0.020000	1.000	1.000	
23001690	M	Goat, meat	0.020000	1.000	1.000	
23001700	M	Goat, meat byproducts	0.060000	1.000	1.000	
23001710	M	Goat, fat	0.020000	1.000	1.000	
23001720	M	Goat, kidney	0.060000	1.000	1.000	
23001730	M	Goat, liver	0.350000	1.000	1.000	
24001890	M	Horse, meat	0.020000	1.000	1.000	
28002210	M	Meat, game	0.020000	1.000	1.000	
27002220	D	Milk, fat	0.010000	1.000	1.000	
27002221	D	Milk, fat - baby food/infant for	0.010000	1.000	1.000	
27012230	D	Milk, nonfat solids	0.010000	1.000	1.000	
27012231	D	Milk, nonfat solids-baby food/in	0.010000	1.000	1.000	
27022240	D	Milk, water	0.010000	1.000	1.000	
27022241	D	Milk, water-babyfood/infant form	0.010000	1.000	1.000	
27032251	D	Milk, sugar (lactose)-baby food/	0.010000	1.000	1.000	
15002310	15	Oat, bran	0.200000	1.000	1.000	
15002320	15	Oat, flour	0.080000	1.000	1.000	
15002321	15	Oat, flour-babyfood	0.080000	1.000	1.000	
15002330	15	Oat, groats/rolled oats	0.080000	1.000	1.000	
15002331	15	Oat, groats/rolled oats-babyfood	0.080000	1.000	1.000	

25002900	M	Pork, meat	0.020000	1.000	1.000	
25002901	M	Pork, meat-babyfood	0.020000	1.000	1.000	
25002910	M	Pork, skin	0.020000	1.000	1.000	
25002920	M	Pork, meat byproducts	0.020000	1.000	1.000	
25002921	M	Pork, meat byproducts-babyfood	0.020000	1.000	1.000	
25002930	M	Pork, fat	0.020000	1.000	1.000	
25002931	M	Pork, fat-babyfood	0.020000	1.000	1.000	
25002940	M	Pork, kidney	0.020000	1.000	1.000	
25002950	M	Pork, liver	0.020000	1.000	1.000	
60003010	P	Poultry, other, meat	0.020000	1.000	1.000	
60003020	P	Poultry, other, liver	0.020000	1.000	1.000	
60003030	P	Poultry, other, meat byproducts	0.020000	1.000	1.000	
60003040	P	Poultry, other, fat	0.020000	1.000	1.000	
60003050	P	Poultry, other, skin	0.020000	1.000	1.000	
29003120	M	Rabbit, meat	0.020000	1.000	1.000	
15003280	15	Rye, grain	0.020000	1.000	1.000	
15003290	15	Rye, flour	0.020000	1.000	1.000	
26003390	M	Sheep, meat	0.020000	1.000	1.000	
26003391	M	Sheep, meat-babyfood	0.020000	1.000	1.000	
26003400	M	Sheep, meat byproducts	0.060000	1.000	1.000	
26003410	M	Sheep, fat	0.020000	1.000	1.000	
26003411	M	Sheep, fat-babyfood	0.020000	1.000	1.000	
26003420	M	Sheep, kidney	0.060000	1.000	1.000	
26003430	M	Sheep, liver	0.350000	1.000	1.000	
15003810	15	Triticale, flour	0.020000	1.000	1.000	
15003811	15	Triticale, flour-babyfood	0.020000	1.000	1.000	
50003820	P	Turkey, meat	0.020000	1.000	1.000	
50003821	P	Turkey, meat-babyfood	0.020000	1.000	1.000	
50003830	P	Turkey, liver	0.020000	1.000	1.000	
50003831	P	Turkey, liver-babyfood	0.020000	1.000	1.000	
50003840	P	Turkey, meat byproducts	0.020000	1.000	1.000	
50003841	P	Turkey, meat byproducts-babyfood	0.020000	1.000	1.000	
50003850	P	Turkey, fat	0.020000	1.000	1.000	
50003851	P	Turkey, fat-babyfood	0.020000	1.000	1.000	
50003860	P	Turkey, skin	0.020000	1.000	1.000	
50003861	P	Turkey, skin-babyfood	0.020000	1.000	1.000	
86010000	O	Water, direct, all sources	0.004000	1.000	1.000	4.0 pp
		Full comment: 4.0 ppb surface water EDWC				
86020000	O	Water, indirect, all sources	0.004000	1.000	1.000	4.0 pp
		Full comment: 4.0 ppb surface water EDWC				
15004010	15	Wheat, grain	0.020000	1.000	1.000	
15004011	15	Wheat, grain-babyfood	0.020000	1.000	1.000	
15004020	15	Wheat, flour	0.020000	1.000	1.000	
15004021	15	Wheat, flour-babyfood	0.020000	1.000	1.000	
15004030	15	Wheat, germ	0.020000	1.000	1.000	
15004040	15	Wheat, bran	0.020000	1.000	1.000	

Attachment 2. Acute DEEM-FCID™ Analysis – General U.S. Population, Including Infants and Children.

U.S. Environmental Protection Agency Ver. 2.02
 DEEM-FCID ACUTE Analysis for PYRASULFOTOLE (1994-98 data)
 Residue file: 000692a.R98 Adjustment factor #2 NOT used.
 Analysis Date: 06-06-2007/13:34:48 Residue file dated: 06-06-2007/13:33:06/8
 NOEL (Acute) = 3.800000 mg/kg body-wt/day
 Daily totals for food and foodform consumption used.
 Run Comment: "Proposed use on small cereal grains. FQPA Safety Factor=1x; the
 refore, aRfD=aPAD and cRfD=cPAD."
 =====

Summary calculations (per capita):

95th Percentile			99th Percentile			99.9th Percentile		
Exposure	% aRfD	MOE	Exposure	% aRfD	MOE	Exposure	% aRfD	MOE

U.S. Population:								
0.000633	1.67	6005	0.001039	2.74	3655	0.001747	4.60	2175
All infants:								
0.001259	3.31	3018	0.001913	5.04	1985	0.002750	7.24	1382
Children 1-2 yrs:								
0.001393	3.67	2727	0.001847	4.86	2057	0.002698	7.10	1408
Children 3-5 yrs:								
0.001053	2.77	3610	0.001434	3.77	2649	0.002675	7.04	1420
Children 6-12 yrs:								
0.000691	1.82	5502	0.000922	2.43	4119	0.001358	3.57	2797
Youth 13-19 yrs:								
0.000431	1.13	8818	0.000635	1.67	5981	0.001056	2.78	3600
Adults 20-49 yrs:								
0.000378	0.99	10060	0.000535	1.41	7096	0.000885	2.33	4292
Adults 50+ yrs:								
0.000331	0.87	11476	0.000439	1.15	8664	0.000966	2.54	3933
Females 13-49 yrs:								
0.000368	0.97	10330	0.000518	1.36	7340	0.000888	2.34	4277

Attachment 3: Residue File for Chronic DEEM-FCID™ Analysis.

Filename: C:\Documents and Settings\jtyler\My Documents\JenWork\Pyrasulfatole\DEEM\000692c.R98
 Chemical: Pyrasulfatole
 RfD(Chronic): .01 mg/kg bw/day NOEL(Chronic): 1 mg/kg bw/day
 RfD(Acute): .038 mg/kg bw/day NOEL(Acute): 3.8 mg/kg bw/day
 Date created/last modified: 06-06-2007/13:33:53/8 Program ver. 2.03
 Comment: Proposed use on small cereal grains. FQPA safety factor=1x; therefore, aRfD=aPAD and cRfD=cPAD.

EPA Code	Crop Grp	Commodity Name	Def Res (ppm)	Adj. Factors #1	Adj. Factors #2	Comment
15000250	15	Barley, pearled barley	0.020000	1.000	1.000	
15000251	15	Barley, pearled barley-babyfood	0.020000	1.000	1.000	
15000260	15	Barley, flour	0.020000	1.000	1.000	
15000261	15	Barley, flour-babyfood	0.020000	1.000	1.000	
15000270	15	Barley, bran	0.020000	1.000	1.000	
21000440	M	Beef, meat	0.020000	1.000	1.000	
21000441	M	Beef, meat-babyfood	0.020000	1.000	1.000	
21000450	M	Beef, meat, dried	0.020000	1.000	1.000	
21000460	M	Beef, meat byproducts	0.060000	1.000	1.000	
21000461	M	Beef, meat byproducts-babyfood	0.060000	1.000	1.000	
21000470	M	Beef, fat	0.020000	1.000	1.000	
21000471	M	Beef, fat-babyfood	0.020000	1.000	1.000	
21000480	M	Beef, kidney	0.060000	1.000	1.000	
21000490	M	Beef, liver	0.350000	1.000	1.000	
21000491	M	Beef, liver-babyfood	0.350000	1.000	1.000	
40000930	P	Chicken, meat	0.020000	1.000	1.000	
40000931	P	Chicken, meat-babyfood	0.020000	1.000	1.000	
40000940	P	Chicken, liver	0.020000	1.000	1.000	
40000950	P	Chicken, meat byproducts	0.020000	1.000	1.000	
40000951	P	Chicken, meat byproducts-babyfoo	0.020000	1.000	1.000	
40000960	P	Chicken, fat	0.020000	1.000	1.000	
40000961	P	Chicken, fat-babyfood	0.020000	1.000	1.000	
40000970	P	Chicken, skin	0.020000	1.000	1.000	
40000971	P	Chicken, skin-babyfood	0.020000	1.000	1.000	
70001450	P	Egg, whole	0.020000	1.000	1.000	
70001451	P	Egg, whole-babyfood	0.020000	1.000	1.000	
70001460	P	Egg, white	0.020000	1.000	1.000	
70001461	P	Egg, white (solids)-babyfood	0.020000	1.000	1.000	
70001470	P	Egg, yolk	0.020000	1.000	1.000	
70001471	P	Egg, yolk-babyfood	0.020000	1.000	1.000	
23001690	M	Goat, meat	0.020000	1.000	1.000	
23001700	M	Goat, meat byproducts	0.060000	1.000	1.000	
23001710	M	Goat, fat	0.020000	1.000	1.000	
23001720	M	Goat, kidney	0.060000	1.000	1.000	
23001730	M	Goat, liver	0.350000	1.000	1.000	
24001890	M	Horse, meat	0.020000	1.000	1.000	
28002210	M	Meat, game	0.020000	1.000	1.000	
27002220	D	Milk, fat	0.010000	1.000	1.000	
27002221	D	Milk, fat - baby food/infant for	0.010000	1.000	1.000	
27012230	D	Milk, nonfat solids	0.010000	1.000	1.000	
27012231	D	Milk, nonfat solids-baby food/in	0.010000	1.000	1.000	
27022240	D	Milk, water	0.010000	1.000	1.000	
27022241	D	Milk, water-babyfood/infant form	0.010000	1.000	1.000	
27032251	D	Milk, sugar (lactose)-baby food/	0.010000	1.000	1.000	
15002310	15	Oat, bran	0.200000	1.000	1.000	
15002320	15	Oat, flour	0.080000	1.000	1.000	
15002321	15	Oat, flour-babyfood	0.080000	1.000	1.000	
15002330	15	Oat, groats/rolled oats	0.080000	1.000	1.000	
15002331	15	Oat, groats/rolled oats-babyfood	0.080000	1.000	1.000	

25002900	M	Pork, meat	0.020000	1.000	1.000	
25002901	M	Pork, meat-babyfood	0.020000	1.000	1.000	
25002910	M	Pork, skin	0.020000	1.000	1.000	
25002920	M	Pork, meat byproducts	0.020000	1.000	1.000	
25002921	M	Pork, meat byproducts-babyfood	0.020000	1.000	1.000	
25002930	M	Pork, fat	0.020000	1.000	1.000	
25002931	M	Pork, fat-babyfood	0.020000	1.000	1.000	
25002940	M	Pork, kidney	0.020000	1.000	1.000	
25002950	M	Pork, liver	0.020000	1.000	1.000	
60003010	P	Poultry, other, meat	0.020000	1.000	1.000	
60003020	P	Poultry, other, liver	0.020000	1.000	1.000	
60003030	P	Poultry, other, meat byproducts	0.020000	1.000	1.000	
60003040	P	Poultry, other, fat	0.020000	1.000	1.000	
60003050	P	Poultry, other, skin	0.020000	1.000	1.000	
29003120	M	Rabbit, meat	0.020000	1.000	1.000	
15003280	15	Rye, grain	0.020000	1.000	1.000	
15003290	15	Rye, flour	0.020000	1.000	1.000	
26003390	M	Sheep, meat	0.020000	1.000	1.000	
26003391	M	Sheep, meat-babyfood	0.020000	1.000	1.000	
26003400	M	Sheep, meat byproducts	0.060000	1.000	1.000	
26003410	M	Sheep, fat	0.020000	1.000	1.000	
26003411	M	Sheep, fat-babyfood	0.020000	1.000	1.000	
26003420	M	Sheep, kidney	0.060000	1.000	1.000	
26003430	M	Sheep, liver	0.350000	1.000	1.000	
15003810	15	Triticale, flour	0.020000	1.000	1.000	
15003811	15	Triticale, flour-babyfood	0.020000	1.000	1.000	
50003820	P	Turkey, meat	0.020000	1.000	1.000	
50003821	P	Turkey, meat-babyfood	0.020000	1.000	1.000	
50003830	P	Turkey, liver	0.020000	1.000	1.000	
50003831	P	Turkey, liver-babyfood	0.020000	1.000	1.000	
50003840	P	Turkey, meat byproducts	0.020000	1.000	1.000	
50003841	P	Turkey, meat byproducts-babyfood	0.020000	1.000	1.000	
50003850	P	Turkey, fat	0.020000	1.000	1.000	
50003851	P	Turkey, fat-babyfood	0.020000	1.000	1.000	
50003860	P	Turkey, skin	0.020000	1.000	1.000	
50003861	P	Turkey, skin-babyfood	0.020000	1.000	1.000	
86010000	O	Water, direct, all sources	0.002800	1.000	1.000	2.8 pp
		Full comment: 2.8 ppb surface water EDWC				
86020000	O	Water, indirect, all sources	0.002800	1.000	1.000	2.8 pp
		Full comment: 2.8 ppb surface water EDWC				
15004010	15	Wheat, grain	0.020000	1.000	1.000	
15004011	15	Wheat, grain-babyfood	0.020000	1.000	1.000	
15004020	15	Wheat, flour	0.020000	1.000	1.000	
15004021	15	Wheat, flour-babyfood	0.020000	1.000	1.000	
15004030	15	Wheat, germ	0.020000	1.000	1.000	
15004040	15	Wheat, bran	0.020000	1.000	1.000	

Attachment 4: Chronic DEEM-FCID™ Analysis.

U.S. Environmental Protection Agency
 DEEM-FCID Chronic analysis for PYRASULFOTOLE
 Residue file name: C:\Documents and Settings\jtyler\My
 Documents\JenWork\Pyrasulfatole\DEEM\000692c.R98

Ver. 2.00
 (1994-98 data)

Adjustment factor #2 NOT used.

Analysis Date 06-06-2007/13:35:21 Residue file dated: 06-06-2007/13:33:53/8
 Reference dose (RfD, Chronic) = .01 mg/kg bw/day

COMMENT 1: Proposed use on small cereal grains. FQPA safety factor=1x; therefore,
 aRfD=aPAD and cRfD=cPAD.

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Total exposure by population subgroup

Population Subgroup	Total Exposure	
	mg/kg body wt/day	Percent of Rfd
U.S. Population (total)	0.000224	2.2%
U.S. Population (spring season)	0.000222	2.2%
U.S. Population (summer season)	0.000224	2.2%
U.S. Population (autumn season)	0.000227	2.3%
U.S. Population (winter season)	0.000221	2.2%
Northeast region	0.000221	2.2%
Midwest region	0.000233	2.3%
Southern region	0.000209	2.1%
Western region	0.000239	2.4%
Hispanics	0.000255	2.6%
Non-hispanic whites	0.000218	2.2%
Non-hispanic blacks	0.000222	2.2%
Non-hisp/non-white/non-black	0.000246	2.5%
All infants (< 1 year)	0.000410	4.1%
Nursing infants	0.000155	1.6%
Non-nursing infants	0.000506	5.1%
Children 1-6 yrs	0.000580	5.8%
Children 7-12 yrs	0.000318	3.2%
Females 13-19 (not preg or nursing)	0.000166	1.7%
Females 20+ (not preg or nursing)	0.000158	1.6%
Females 13-50 yrs	0.000177	1.8%
Females 13+ (preg/not nursing)	0.000192	1.9%
Females 13+ (nursing)	0.000227	2.3%
Males 13-19 yrs	0.000211	2.1%
Males 20+ yrs	0.000172	1.7%
Seniors 55+	0.000160	1.6%
Children 1-2 yrs	0.000698	7.0%
Children 3-5 yrs	0.000541	5.4%
Children 6-12 yrs	0.000339	3.4%
Youth 13-19 yrs	0.000190	1.9%
Adults 20-49 yrs	0.000168	1.7%
Adults 50+ yrs	0.000160	1.6%
Females 13-49 yrs	0.000161	1.6%