OFFICE OF CHEMICAL SAFETY AND POLLUTION PREVENTION

WASHINGTON, D.C. 20460

MEMORANDUM

DATE: April 17, 2024

SUBJECT: **Saflufenacil.** Acute and Chronic Aggregate Dietary (Food and Drinking Water) Exposure and Risk Assessments to Support the Registration Review and Human Health Risk Assessment for New Tolerances in/on Mint Commodities and Crop Group Conversions/Expansions.

PC Code: 118203
CAS No.: 372137-35-4
Petition No.: 2E9045
Risk Assessment Type: NA
TXR No.: NA
MRID No.: NA

Task Group No.: 00484712
Parent Case No.: 00478596
Registration No.: 7969-275, 7969-278, 7969-276
Regulatory Action: Section 3
Reg Review Case No.: NA
40 CFR: §180.649

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The conclusions conveyed in this assessment were developed in full compliance with *EPA Scientific Integrity Policy for Transparent and Objective Science*, and EPA Scientific Integrity Program's *Approaches for Expressing and Resolving Differing Scientific Opinions.* The full text of *EPA Scientific Integrity Policy for Transparent and Objective Science*, as updated and approved by the Scientific Integrity Committee and EPA Science Advisor can be found here: https://www.epa.gov/system/files/documents/2023-12/scientific_integrity_policy_2012_accessible.pdf. The full text of the EPA Scientific Integrity Program's *Approaches for Expressing and Resolving Differing Scientific Opinions* can be found here: https://www.epa.gov/scientific-integrity/approaches-expressing-and-resolving-differing-scientific-opinions.

Executive Summary

Acute and chronic aggregate dietary (food and drinking water) exposure and risk assessments were conducted using the Dietary Exposure Evaluation Model software with the Food Commodity Intake Database (DEEM-FCID) Version 4.02. This software uses 2005-2010 food consumption data from the U.S. Department of Agriculture's (USDA's) National Health and Nutrition Examination Survey, What We Eat in America (NHANES/WWEIA). The analyses were conducted to support the Registration Review risk assessment for saflufenacil and human health risk assessment for the proposed new tolerances in/on mint commodities and crop group conversions/expansions. This memorandum was reviewed by two peer reviewers of the DESAC (and the entire DESAC on 27-SEP-2023, per the DESAC Standard Operating Procedure (SOP, 27-JUL-2023).

Unrefined acute and chronic aggregate dietary (food and drinking water) exposure and risk and assessments were performed to support Registration Review and the establishment of permanent tolerances for residues in/on mint and crop group expansions and conversions. These analyses included all the crops with established tolerances. The proposed tolerances do not impact the livestock feeding burden or the established tolerances for meat and dairy commodities. Therefore, there is no increase in the estimated dietary exposure for the general U.S. population and all population subgroups. The assessments used tolerance-level residues with adjustments for metabolites, HED's default processing factors, 100 percent crop treated (PCT) assumptions, and the estimated drinking water concentrations (EDWCs) from acute/chronic water exposures. The petitioner later withdrew the following crop group conversions actions for saflufenacil: Barley subgroup 15-22B, Wheat subgroup 15-22A, Edible-podded bean subgroup 6-22A, Edible-podded pea subgroup 6-22B, Field corn subgroup 15-22C, Forage and hay of legume vegetable group 7-22 (except pea, hay), Forage, hay, stover, and straw of cereal grain group 16-22 (except barley, chia, and wheat straw), Grain sorghum and millet subgroup 15-22E, Pulses, dried shelled bean, except soybean, subgroup 6-22E, Pulses, dried shelled pea subgroup 6-22F, Rice subgroup 15-22F, Succulent shelled bean subgroup 6-22C, Succulent shelled pea subgroup 6-22D, and Sweet corn subgroup 15-22D (Email communication from Maya Wheeler to HED on April 8, 2024; IR-4 correspondence on March 15, 2024)

Although the petitioner later withdrew crop group expansions and conversions, the dietary assessments are not being updated at this time since there are no dietary exposures of concern. However, the dietary assessment will be updated in future actions to show the exclusion of those commodities.

Acute Dietary Exposure Assessment

The unrefined acute dietary (food and drinking water) exposures were not of concern (<100% of the acute population-adjusted dose (aPAD)) for the general U.S. population and all population subgroups. The general U.S. population used <1% of the aPAD at the 95th percentile of exposure. The most highly exposed population subgroup was all infants <1 year old which used <1% of the aPAD at the 95th percentile of exposure.

Chronic Dietary Exposure Assessment

The unrefined chronic dietary (food and drinking water) exposures were not of concern (<100% of the chronic population-adjusted dose (cPAD)) for the general U.S. population and all population subgroups. The general U.S. population used 9.3% of the cPAD. The most highly exposed population subgroup was all infants <1 year old which used 26% of the cPAD.

Cancer Dietary Exposure Assessment

A separate cancer dietary (food and drinking water) exposure and risk assessment is not required because saflufenacil is classified as "not likely to be carcinogenic to humans." (TXR 0056720)

I. 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 (i.e., the dose that HED has concluded will result in no unreasonable adverse health effects). This dose is referred to as the population-adjusted dose (PAD). The PAD is equivalent to the point of departure (POD) divided by all applicable uncertainty factors, including the FQPA Safety Factor.

For acute and non-cancer chronic exposures, HED is concerned when estimated dietary risk exceeds 100% of the PAD. References that discuss the acute and chronic risk assessments in more detail are available on the EPA/pesticides web site: "Available Information on Assessing Exposure from Pesticides, A User's Guide," 21-JUN-2000, web link: https://www.regulations.gov/document?D=EPA-HQ-OPP-2007-0780-0001; or see SOP 99.6 (20-AUG-1999).

The most recent dietary risk assessment for saflufenacil was conducted by O. Gbemigun (D462363, 16-JUN-2021).

II. Residue Information

In 2009, the residues of concern for saflufenacil and metabolites M800H11, and M800H35 in/on cereal grain primary crops, rotational crops, livestock, and drinking water were originally determined by the HED Residues of Concern Knowledgebase Subcommittee (ROCKS; B. Daiss, D359645, 06-JAN-2009). An additional major metabolite (M800H02), that is not included in the tolerance expression, was subsequently identified as a potential residue of concern following post-emergence treatment. Residues of concern are summarized in Table 1 below.

Table 1. Summary of Metabolites and Degradates to be Included in the Risk Assessment and Tolerance Expression.			
Matrix		**Residues Included in Risk Assessment**	**Residues Included in Tolerance Expression**
Plants	Primary Crops (preplant application)*	Saflufenacil + M800H11, M800H35	Saflufenacil + M800H11, M800H35
	Primary Crops (foliar application)	Saflufenacil + M800H11, M800H02, M800H35	
	Rotational Crops	Saflufenacil + M800H11, M800H35	
Livestock	Ruminants	Saflufenacil	Saflufenacil
	Poultry		
Drinking Water		Saflufenacil + M800H01, M800H02, M800H07, M800H08, M800H15, M800H22, Product 8	Not Applicable

* Plus post-emergence foliar application to cereal grains and grasses and to weeds in fruit/nut orchards/groves.

Residues Assumptions Incorporated into the Dietary Assessment: For all registered and proposed commodities, the chronic dietary exposure analysis assumed 100% CT and tolerance-level residues. HED's default processing factors were used, and for those commodities that require processing studies, the processing factor is set to 1 if a separate tolerance was not established (i.e., orange juice). Drinking water was incorporated directly in the dietary assessment DEEM-FCID model in the food categories "water, direct, all sources" and "water, indirect, all sources. Residues in/on all food commodities used in the dietary analyses were based on the previously established tolerances listed in 40 CFR §180.649 and crop group conversions.

Table 2. Tolerance Summary for Saflufenacil (40 CFR §180.649) Under Tolerance Petition 2E9045.				
Commodity/ **Correct Commodity Definition**	Established Tolerance (ppm)	Proposed Tolerance (ppm)	HED-Recommended Tolerance (ppm)	Comments
40 CFR 180.649 (a) General. (1) Tolerances are established for residues of saflufenacil, including its metabolites and degradates, in or on the commodities in the table below. Compliance with the tolerance levels specified below is to be determined by measuring only the sum of saflufenacil, 2-chloro-5-[3,6-dihydro-3-methyl-2,6-dioxo-4-(trifluoromethyl)-1(2*H*)-pyrimidinyl]-4-fluoro-*N*-[[methyl(1-methylethyl)amino]sulfonyl]benzamide, and its metabolites *N*-[2-chloro-5-(2,6-dioxo-4-(trifluoromethyl)-3,6-dihydro-1(2*H*)-pyrimidinyl)-4-fluorobenzoyl]-*N*'-isopropylsulfamide and *N*-[4-chloro-2-fluoro-5-({[(isopropylamino)sulfonyl]amino}carbonyl)phenyl]urea, calculated as the stoichiometric equivalent of saflufenacil, in or on the plant commodities.				
Barley subgroup 15-22B		1	1	Crop group expansion based on Barley, grain tolerance at 1.0 ppm.
Barley, grain	1.0	-	remove	
Field corn subgroup 15-22C	-	0.03	0.03	Based on Grain, cereal, group 15 (except barley and wheat grain) tolerance at 0.03 ppm.
Fruit, citrus, group 10-10	-	0.03	0.03	Tolerance based on Fruit, citrus, group 10 tolerance at 0.03 ppm.
Fruit, citrus, group 10	0.03	-	remove	
Fruit, pome, group 11-10	-	0.03	0.03	Tolerance based on Fruit, pome, group 11 tolerance at 0.03 ppm.
Fruit, pome, group 11	0.03	-	remove	
Fruit, stone, group 12-12	-	0.03	0.03	Tolerance based on Fruit, stone, group 12 tolerance at 0.03 ppm.
Fruit, stone, group 12	0.03	-	remove	
Grain, cereal, forage, hay, stover, and straw, group 16-22, except barley, chia,	-	0.1	0.1	Tolerance based on Grain, cereal, forage, fodder, and straw group 16

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Commodity/ **Correct Commodity Definition**	Established Tolerance (ppm)	Proposed Tolerance (ppm)	HED-Recommended Tolerance (ppm)	Comments
wheat, straw				(except barley and wheat straw) tolerance at 0.1 ppm.
Grain, cereal, forage, fodder, and straw group 16 (except barley and wheat straw)	0.1	-	remove	
Grain sorghum and millet subgroup 15-22E		0.03	0.03	Tolerance based on Grain, cereal, group 15 (except barley and wheat grain) tolerance at 0.03 ppm.
Grain, cereal, group 15 (except barley and wheat grain	0.03	-	remove	
Mint, dried leaves	-	0.04	0.03	Tolerance based on mint, dried leaves residue data.
Mint, fresh leaves	-	0.04	0.03	Tolerance based on mint, fresh leaves residue data.
Nut, tree, group 14-12	-	0.03	0.03	Tolerance based on Nut, tree, group 14 tolerance at 0.03 ppm.
Nut, tree, group 14	0.03	-	remove	
Pistachio	0.03	-	remove	
Rice subgroup 15-22F	-	0.03	0.03	Tolerances based on Grain, cereal, group 15 (except barley and wheat grain) tolerance at 0.03 ppm.
Sweet corn subgroup 15-22D	-	0.03	0.03	
Vegetable, legume, bean, edible podded, subgroup 6-22A	-	0.03	0.03	Tolerance based on Vegetable, legume (bean and pea), edible podded, subgroup 6A tolerance at 0.03 ppm.
Vegetable, legume, edible podded, subgroup 6A	0.03	-	remove	
Vegetable, legume, bean, succulent shelled, subgroup 6-22C	-	0.03	0.03	Tolerance based on Pea and bean, succulent shelled, subgroup 6B tolerance at 0.03 ppm.
Pea and bean, succulent shelled, subgroup 6B	0.03	-	remove	
Vegetable, legume, forage and hay, group 7-22, except pea, field, hay	-	0.1	0.1	Tolerance based on Vegetable, foliage of legume, group 7 (except pea, hay) tolerance at 0.1 ppm.
Vegetable, foliage of legume, group 7 (except pea, hay)	0.1	-	remove	
Vegetable, legume, pea, edible podded, subgroup 6-22B	-	0.03	0.03	Tolerance based on Vegetable, legume (bean and pea), edible podded, subgroup 6A tolerance at 0.03 ppm.
Vegetable, legume, edible podded, subgroup 6A	0.03	-	remove	
Vegetable, legume, pea, succulent shelled, subgroup 6-22D	-	0.03	0.03	Tolerance based on Pea and bean, succulent shelled, subgroup 6B tolerance at 0.03 ppm.
Pea and bean, succulent shelled, subgroup 6B	0.03	-	remove	
Vegetable, legume, pulse, bean, dried shelled, except soybean, subgroup 6-22E	-	0.3	0.3	Correct commodity definition. Tolerance based on Pea and bean, dried shelled, except soybean, subgroup 6C tolerance at 0.3 ppm.
Pea and bean, dried shelled, except soybean, subgroup 6C	0.3	-	remove	
Vegetable, legume, pulse, pea, dried shelled, subgroup 6-22F	-	0.3	0.3	Tolerance based on Pea and bean, dried shelled, except soybean, subgroup 6C tolerance at 0.3 ppm.
Pea and bean, dried shelled, except soybean, subgroup 6C	0.3	-	remove	

Table 2. Tolerance Summary for Saflufenacil (40 CFR §180.649) Under Tolerance Petition 2E9045.				
Commodity/ **Correct Commodity Definition**	Established Tolerance (ppm)	Proposed Tolerance (ppm)	HED-Recommended Tolerance (ppm)	Comments
Wheat subgroup 15-22A	-	0.7	0.7	Tolerance based on Wheat, grain tolerance at 0.6 ppm. Increased tolerance level to 0.7 ppm to harmonize with Codex.
Wheat, grain	0.6	-	remove	
Chia, seed	0.6	-	remove	

Previous tolerance-level residues for all commodities were included in the dietary input files except for cottonseed; sunflower subgroup 20B; soybean, seed; vegetable, legume, subgroup 6C, pea and bean (except soybean); and rapeseed subgroup 20A. For these crops, residues were also based on the recommended tolerances; however, a correction factor was applied to the tolerance level to account for the M800H02 metabolite included in the risk assessment as a result of preharvest uses. The additional metabolite, M800H02, was observed in the metabolism studies of preharvest-treated soybean seed, comprising 26.3% of the total radioactive residues (G. Kramer, D381129, 24-MAR-2011).

Since the toxicity of the M800H02 is expected to be comparable to that of the parent compound, it was included in the risk assessment for preharvest uses, but not in the tolerance expression. To account for the exposure to this metabolite, the recommended tolerance level was multiplied by a correction factor of 1.7X, where 1.7 = (Metabolites in Risk Assessment)/(Metabolites in Tolerance Expression).

1.7 = (Saflufenacil + M800H11 + M800H02 + M800H35)/(Saflufenacil + M800H11 + M800H35) = (26.1% + 10.9% + 26.3% + 0%)/(26.1% + 10.9% + 0%)

Therefore, in the acute and chronic assessments, a residue of 0.34 ppm was used for cottonseed; a residue of 1.7 ppm was used for sunflower subgroup 20B; a residue of 0.51 ppm was used for soybean, seed and vegetable, legume, subgroup 6C, pea and bean (except soybean); and a residue of 1.02 ppm was used for rapeseed subgroup 20A (see Table 3).

Table 3. Corrected Residues Used in the Acute and Chronic Assessment.		
Crop Group and/or Commodity	Tolerance (ppm)	Corrected Residue Used in Dietary Assessments[1]
Cottonseed Subgroup 20C	0.2	0.34
Sunflower Subgroup 20B	1	1.7
Soybean, seed	0.3	0.51
Vegetable, Legume, Subgroup 6C, pea and bean (except soybean)	0.3	0.51
Rapeseed Subgroup 20A	0.6	1.02

[1] Tolerance level residues were corrected to account for the addition of the M800H02 metabolite which was observed in the metabolism studies of preharvest-treated soybean seed. The recommended tolerance level was multiplied by a correction factor of 1.7X, where 1.7 = (Metabolites in Risk Assessment)/(Metabolites in Tolerance Expression).

Residues in Fish

The USDA Pesticide Data Program (PDP) monitored pesticide residues in catfish in 2008, 2009, and 2010 and salmon in 2013 and 2014. In general, pesticide residues would not be expected to be found in fish unless the pesticide bioaccumulates or has an aquatic use. To determine whether or not residues are present in fish, HED now routinely checks PDP monitoring data regardless of the pesticide's uses and physicochemical properties. However, PDP did not analyze fish samples for saflufenacil. As a result, residues in fish were not included in the assessment. Due to tolerances, fish and shellfish are included in this assessment.

III. Percent Crop Treated Information

The acute and chronic dietary exposure assessments assumed that 100 PCT for all commodities.

IV. Drinking Water Data

The EDWCs used in the dietary risk assessment were provided by the Environmental Fate and Effects Division (EFED) in the most recent drinking water assessment (DWA) for saflufenacil (M. Ruhman, D414485, 12-MAR-2014). We received a confirmation from EFED that the previous EDWC remain unchanged. (Email correspondence with M. Ruhman, 22-DEC-2022). The EFED-recommended EDWCs were incorporated directly into this dietary assessment. Water residues were incorporated in the DEEM-FCID into the food categories "water, direct, all sources" and "water, indirect, all sources." The sources of EDWCs provided by EFED and EFED's estimates are summarized in Table 4.

Table 4. Tiered EDWCs for Proposed Saflufenacil Uses.

Source (Tier: Model)	1-in-10-Year Peak Exposure (ppb)	1-in-10-Year Annual Mean Exposure (ppb)
Surface water (Tier I: Rice Model)	**133** (used in acute analysis)	**120** (used in chronic analysis)
Ground water (Tier II: PRZM GW)	94.6	63.1

[1] The EDWCs recommended for HED dietary assessment are in bold.

The drinking water models and their descriptions are available at the EPA internet site: https://www.epa.gov/pesticide-science-and-assessing-pesticide-risks/models-pesticide-risk-assessment.

V. DEEM-FCID Program and Consumption Information

Saflufenacil acute and chronic dietary exposure assessments were conducted using the DEEM-FCID, Version 4.02, which incorporates 2005-2010 consumption data from USDA's NHANES/WWEIA. The 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. For chronic exposure assessment, consumption data are averaged for the entire U.S. population and within population subgroups. However, for acute exposure assessment, consumption data are retained as

individual consumption events. Based on analysis of the 2005-2010 WWEIA consumption data, which took into account dietary patterns and survey respondents, HED concluded that it is most appropriate to report risk for the following population subgroups: the general U.S. population, all infants (<1 year old), children 1-2, children 3-5, children 6-12, youth 13-19, adults 20-49, females 13-49, and adults 50-99 years old.

For a chronic dietary exposure 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 to produce a residue intake estimate. The resulting residue intake estimate for each food/food form is summed with the residue intake 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 an acute exposure assessment, 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 exposure assessment, or "matched" in multiple random pairings with residue values and then summed in a probabilistic assessment. The resulting distribution of exposures is expressed as a percentage of the aPAD on both a user (i.e., only 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 analyses performed at all levels of refinement. However, for deterministic assessments, any significant differences in user vs. per capita exposure and risk are specifically identified and noted in the risk assessment.

VI. Toxicological Information

The toxicological doses and endpoints selected for acute and chronic dietary risk assessments of saflufenacil are summarized in Table 5.

Table 5. Summary of Toxicological Doses and Endpoints for Saflufenacil for Use in Dietary Human Health Risk Assessments.

Exposure/ Scenario	Point of Departure	Uncertainty/ FQPA SFs	RfD, PAD, LOC for Risk Assessment	Study and Toxicological Effects
Acute Dietary (General Population, including Infants and Children)	NOAEL = 500 mg/kg/day	UF_A = 10X UF_H = 10X FQPA SF = 1X	Acute RfD = 5.0 mg/kg aPAD = 5.0 mg/kg	Acute Neurotoxicity Study (rat) NOAEL = 500 (M) and 2000 (F) mg/kg/day. LOAEL was 2000 mg/kg/day (males) based on the decreased motor activity representing mild and transient systemic toxicity. LOAEL was not established for females.
Chronic Dietary (All Populations)	NOAEL = 4.6 mg/kg/day	UF_A = 10X UF_H = 10X FQPA SF = 1X	Chronic RfD = 0.046 mg/kg/day cPAD = 0.046 mg/kg/day	Chronic/Carcinogenicity (mouse) NOAEL = 4.6 mg/kg bw/d (males) and 18.9 mg/kg bw/d (females). LOAELs = 13.8 mg/kg bw/d (males) and 38.1 mg/kg bw/day (females) based on decreased red blood cells, hemoglobin, and hematocrit and porphyria observed in the satellite group.

Table 5. Summary of Toxicological Doses and Endpoints for Saflufenacil for Use in Dietary Human Health Risk Assessments.	
Cancer (oral, dermal, inhalation)	Classification: not likely to be carcinogenic to humans based on the lack of tumors in the mouse and rat carcinogenicity studies and lack of mutagenicity.

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

VII. Results/Discussion

As stated above, for acute and chronic assessments, HED is concerned when dietary risk estimates exceed 100% of the PAD. The DEEM-FCID analyses estimate the dietary exposure and risk of the general U.S. population and various population subgroups. The results reported in Table 6 are for the general U.S. population, all infants (<1 year old), children 1-2, children 3-5, children 6-12, youth 13-19, females 13-49, adults 20-49, and adults 50-99 years old.

Results of Acute Dietary (Food and Drinking Water) Exposure and Risk Assessment

The results of the acute dietary (food and drinking water) exposure and risk assessment at the 95th percentile of exposure are reported in Table 6 below. The unrefined acute dietary (food and drinking water) exposures were not of concern (<100% of the aPAD) for the general U.S. population and all population subgroups. The general U.S. population used <1% of the aPAD at the 95th percentile of exposure. The most highly exposed population subgroup was all infants <1 year old which used <1% of the aPAD at the 95th percentile of exposure.

Results of Chronic Dietary (Food and Drinking Water) Exposure and Risk Assessment

The results of the chronic dietary (food and drinking water) exposure and risk assessment are reported in Table 6 below. The unrefined chronic dietary (food and drinking water) exposures were not of concern (<100% of the cPAD) for the general U.S. population and all population subgroups. The general U.S. population used 9.3% of the cPAD. The most highly exposed population subgroup was all infants <1 year old which used 26% of the cPAD.

Results of Cancer Dietary (and Drinking Water) Exposure and Risk Assessment

A separate cancer dietary (food and drinking water) exposure and risk assessment is not required because saflufenacil is classified as “not likely to be carcinogenic to humans.”

Table 6. Summary of Dietary (Food and Drinking Water) Exposure Risk for Saflufenacil.*				
Population Subgroup	Acute Dietary (95th Percentile)		Chronic Dietary	
	Dietary Exposure (mg/kg/day)	% aPAD	Dietary Exposure (mg/kg/day)	% cPAD
General U.S. Population	0.010215	<1	0.004296	9.3
All Infants (<1-year old)	**0.029126**	**<1**	**0.011983**	**26**
Children 1-2 years old	0.017401	<1	0.008557	19
Children 3-5 years old	0.013946	<1	0.007414	16
Children 6-12 years old	0.010698	<1	0.004839	11
Youth 13-19 years old	0.008265	<1	0.003377	7.3
Adults 20-49 years old	0.009148	<1	0.003982	8.7
Adults 50-99 years old	0.007698	<1	0.003663	8.0
Females 13-49 years old	0.008880	<1	0.003784	8.2

*The subpopulation(s) with the highest risk estimates are bolded.

VIII. Characterization of Inputs/Outputs

HED has conducted a conservative assessment for the currently registered uses of saflufenacil. The assessment used tolerance-level residues with adjustments for metabolites, HED's default processing factors, 100 PCT, and the EDWCs provided by EFED. Various refinements could be made to the assessment. However, as there are no risk estimates of concern, no refinements were incorporated. The acute and chronic dietary exposure and risk analyses using DEEM-FCID indicates that dietary risks to saflufenacil from food and drinking water are well below HED's levels of concern for this pesticide. Estimated acute dietary risks are ≤1% of the aPAD at the 95th percentile for the general U.S. population and all population subgroups, and estimated chronic dietary risks are ≤26% of the cPAD for the general U.S. population and all population subgroups.

IX. Conclusions

Unrefined acute and chronic aggregate (food and water) dietary risk assessments were conducted for saflufenacil. The assessments used default processing factors, 100 PCT assumptions, and the EDWC from acute/chronic water exposures. The resulting acute and chronic dietary exposure and risk estimates are below HED's level of concern. Cancer dietary risk was not conducted. HED is confident that the assessment does not underestimate risk to the general U.S. population or any population subgroup.

X. List of Attachments

Attachment 1: Acute (Food and Drinking Water) Residue Input file
Attachment 2: Acute Exposure and Risk Estimates
Attachment 3: Chronic (Food and Drinking Water) Residue Input File.
Attachment 4: Chronic Exposure and Risk Estimates.

Attachment 1: Acute (Food and Drinking Water) Residue Input file

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Filename: C:\Models\318\SAFLUFENACIL R.10 FILES\saflufenacil ACUTE.R10
Chemical: Saflufenacil  on  mint and others
RfD(Chronic): .046 mg/kg bw/day  NOEL(Chronic): 0 mg/kg bw/day
RfD(Acute): 5 mg/kg bw/day  NOEL(Acute):  0 mg/kg bw/day
Date created/last modified: 10-06-2023/11:15:44       Program ver. 4.02, 05-10-c
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EPA Code	Crop Grp	Commodity Name	Def Res (ppm)	Adj.Factors #1	#2	Comment
0600347000	6	Soybean, seed	0.510000	1.000	1.000	
0600348000	6	Soybean, flour	0.300000	2.200	1.000	
0600348001	6	Soybean, flour-babyfood	0.300000	2.200	1.000	
0600349000	6	Soybean, soy milk	0.510000	1.000	1.000	
0600349001	6	Soybean, soy milk-babyfood or in	0.510000	1.000	1.000	
0600350000	6	Soybean, oil	0.510000	1.000	1.000	
0600350001	6	Soybean, oil-babyfood	0.510000	1.000	1.000	
0601043000	6A	Bean, snap, succulent	0.030000	1.000	1.000	
0601043001	6A	Bean, snap, succulent-babyfood	0.030000	1.000	1.000	
0601257000	6A	Pea, edible podded, succulent	0.030000	1.000	1.000	
0601349500	6AB	Soybean, vegetable	0.030000	1.000	1.000	
0602031000	6B	Bean, broad, succulent	0.030000	1.000	1.000	
0602033000	6B	Bean, cowpea, succulent	0.030000	1.000	1.000	
0602037000	6B	Bean, lima, succulent	0.030000	1.000	1.000	
0602255000	6B	Pea, succulent	0.030000	1.000	1.000	
0602255001	6B	Pea, succulent-babyfood	0.030000	1.000	1.000	
0602259000	6B	Pea, pigeon, succulent	0.030000	1.000	1.000	
0603030000	6C	Bean, black, seed	0.510000	1.000	1.000	
0603032000	6C	Bean, broad, seed	0.510000	1.000	1.000	
0603034000	6C	Bean, cowpea, seed	0.510000	1.000	1.000	
0603035000	6C	Bean, great northern, seed	0.510000	1.000	1.000	
0603036000	6C	Bean, kidney, seed	0.510000	1.000	1.000	
0603038000	6C	Bean, lima, seed	0.510000	1.000	1.000	
0603039000	6C	Bean, mung, seed	0.510000	1.000	1.000	
0603040000	6C	Bean, navy, seed	0.510000	1.000	1.000	
0603041000	6C	Bean, pink, seed	0.510000	1.000	1.000	
0603042000	6C	Bean, pinto, seed	0.510000	1.000	1.000	
0603098000	6C	Chickpea, seed	0.510000	1.000	1.000	
0603098001	6C	Chickpea, seed-babyfood	0.510000	1.000	1.000	
0603099000	6C	Chickpea, flour	0.510000	1.000	1.000	
0603182000	6C	Guar, seed	0.510000	1.000	1.000	
0603182001	6C	Guar, seed-babyfood	0.510000	1.000	1.000	
0603203000	6C	Lentil, seed	0.510000	1.000	1.000	
0603256000	6C	Pea, dry	0.510000	1.000	1.000	
0603256001	6C	Pea, dry-babyfood	0.510000	1.000	1.000	
0603258000	6C	Pea, pigeon, seed	0.510000	1.000	1.000	
1001106000	10A	Citron	0.030000	1.000	1.000	
1001107000	10A	Citrus hybrids	0.030000	1.000	1.000	
1001108000	10A	Citrus, oil	0.030000	1.000	1.000	
1001240000	10A	Orange	0.030000	1.000	1.000	
1001241000	10A	Orange, juice	0.030000	1.000	1.000	empiri
		Full comment: empirical data show no concentration of residues.				
1001241001	10A	Orange, juice-babyfood	0.030000	1.000	1.000	empiri
		Full comment: empirical data show no concentration of residues.				
1001242000	10A	Orange, peel	0.030000	3.300	1.000	
1001369000	10A	Tangerine	0.030000	1.000	1.000	
1001370000	10A	Tangerine, juice	0.030000	1.000	1.000	empiri
		Full comment: empirical data show no concentration of residues.				
1002197000	10B	Kumquat	0.030000	1.000	1.000	
1002199000	10B	Lemon	0.030000	1.000	1.000	
1002200000	10B	Lemon, juice	0.030000	1.000	1.000	empiri
		Full comment: empirical data show no concentration of residues.				
1002200001	10B	Lemon, juice-babyfood	0.030000	1.000	1.000	empiri
		Full comment: empirical data show no concentration of residues.				
1002201000	10B	Lemon, peel	0.030000	3.300	1.000	
1002206000	10B	Lime	0.030000	1.000	1.000	
1002207000	10B	Lime, juice	0.030000	1.000	1.000	empiri
		Full comment: empirical data show no concentration of residues.				

1002207001	10B	Lime, juice-babyfood	0.030000	1.000	1.000	empiri
		Full comment: empirical data show no concentration of residues.				
1003180000	10C	Grapefruit	0.030000	1.000	1.000	
1003181000	10C	Grapefruit, juice	0.030000	1.000	1.000	empiri
		Full comment: empirical data show no concentration of residues.				
1003307000	10C	Pummelo	0.030000	1.000	1.000	
1100007000	11	Apple, fruit with peel	0.030000	1.000	1.000	
1100008000	11	Apple, peeled fruit	0.030000	1.000	1.000	
1100008001	11	Apple, peeled fruit-babyfood	0.030000	1.000	1.000	
1100009000	11	Apple, dried	0.030000	8.000	1.000	
1100009001	11	Apple, dried-babyfood	0.030000	8.000	1.000	
1100010000	11	Apple, juice	0.030000	1.300	1.000	
1100010001	11	Apple, juice-babyfood	0.030000	1.300	1.000	
1100011000	11	Apple, sauce	0.030000	1.000	1.000	
1100011001	11	Apple, sauce-babyfood	0.030000	1.000	1.000	
1100129000	11	Crabapple	0.030000	1.000	1.000	
1100210000	11	Loquat	0.030000	1.000	1.000	
1100266000	11	Pear	0.030000	1.000	1.000	
1100266001	11	Pear-babyfood	0.030000	1.000	1.000	
1100267000	11	Pear, dried	0.030000	6.250	1.000	
1100268000	11	Pear, juice	0.030000	1.300	1.000	
1100268001	11	Pear, juice-babyfood	0.030000	1.300	1.000	
1100310000	11	Quince	0.030000	1.000	1.000	
1201090000	12A	Cherry	0.030000	1.000	1.000	
1201090001	12A	Cherry-babyfood	0.030000	1.000	1.000	
1201091000	12A	Cherry, juice	0.030000	1.500	1.000	
1201091001	12A	Cherry, juice-babyfood	0.030000	1.500	1.000	
1202012000	12B	Apricot	0.030000	1.000	1.000	
1202012001	12B	Apricot-babyfood	0.030000	1.000	1.000	
1202013000	12B	Apricot, dried	0.030000	6.000	1.000	
1202014000	12B	Apricot, juice	0.030000	1.300	1.000	
1202014001	12B	Apricot, juice-babyfood	0.030000	1.300	1.000	
1202230000	12B	Nectarine	0.030000	1.000	1.000	
1202260000	12B	Peach	0.030000	1.000	1.000	
1202260001	12B	Peach-babyfood	0.030000	1.000	1.000	
1202261000	12B	Peach, dried	0.030000	7.000	1.000	
1202261001	12B	Peach, dried-babyfood	0.030000	7.000	1.000	
1202262000	12B	Peach, juice	0.030000	1.300	1.000	
1202262001	12B	Peach, juice-babyfood	0.030000	1.300	1.000	
1203285000	12C	Plum	0.030000	1.000	1.000	
1203285001	12C	Plum-babyfood	0.030000	1.000	1.000	
1203286000	12C	Plum, prune, fresh	0.030000	1.000	1.000	
1203286001	12C	Plum, prune, fresh-babyfood	0.030000	1.000	1.000	
1203287000	12C	Plum, prune, dried	0.030000	5.000	1.000	
1203287001	12C	Plum, prune, dried-babyfood	0.030000	5.000	1.000	
1203288000	12C	Plum, prune, juice	0.030000	1.400	1.000	
1203288001	12C	Plum, prune, juice-babyfood	0.030000	1.400	1.000	
1301055000	13A	Blackberry	0.040000	1.000	1.000	
1301056000	13A	Blackberry, juice	0.040000	1.200	1.000	
1301056001	13A	Blackberry, juice-babyfood	0.040000	1.200	1.000	
1301058000	13A	Boysenberry	0.040000	1.000	1.000	
1301208000	13A	Loganberry	0.040000	1.000	1.000	
1301320000	13A	Raspberry	0.040000	1.000	1.000	
1301320001	13A	Raspberry-babyfood	0.040000	1.000	1.000	
1301321000	13A	Raspberry, juice	0.040000	1.200	1.000	
1301321001	13A	Raspberry, juice-babyfood	0.040000	1.200	1.000	
1304175000	13D	Grape	0.030000	1.000	1.000	
1304176000	13D	Grape, juice	0.030000	1.200	1.000	
1304176001	13D	Grape, juice-babyfood	0.030000	1.200	1.000	
1304178000	13D	Grape, raisin	0.030000	4.300	1.000	
1304179000	13D	Grape, wine and sherry	0.030000	1.200	1.000	
1400003000	14	Almond	0.030000	1.000	1.000	
1400003001	14	Almond-babyfood	0.030000	1.000	1.000	
1400004000	14	Almond, oil	0.030000	2.800	1.000	
1400004001	14	Almond, oil-babyfood	0.030000	2.800	1.000	
1400059000	14	Brazil nut	0.030000	1.000	1.000	
1400068000	14	Butternut	0.030000	1.000	1.000	
1400081000	14	Cashew	0.030000	1.000	1.000	
1400092000	14	Chestnut	0.030000	1.000	1.000	
1400111000	14	Coconut, meat	0.030000	1.000	1.000	

1400111001	14	Coconut, meat-babyfood	0.030000	1.000	1.000
1400112000	14	Coconut, dried	0.030000	1.000	1.000
1400113000	14	Coconut, milk	0.030000	1.000	1.000
1400114000	14	Coconut, oil	0.030000	1.000	1.000
1400114001	14	Coconut, oil-babyfood	0.030000	1.000	1.000
1400155000	14	Hazelnut	0.030000	1.000	1.000
1400156000	14	Hazelnut, oil	0.030000	1.800	1.000
1400185000	14	Hickory nut	0.030000	1.000	1.000
1400213000	14	Macadamia nut	0.030000	1.000	1.000
1400269000	14	Pecan	0.030000	1.000	1.000
1400278000	14	Pine nut	0.030000	1.000	1.000
1400282000	14	Pistachio	0.030000	1.000	1.000
1400391000	14	Walnut	0.030000	1.000	1.000
1500025000	15	Barley, pearled barley	1.000000	1.000	1.000
1500025001	15	Barley, pearled barley-babyfood	1.000000	1.000	1.000
1500026000	15	Barley, flour	1.000000	1.000	1.000
1500026001	15	Barley, flour-babyfood	1.000000	1.000	1.000
1500027000	15	Barley, bran	1.500000	1.000	1.000
1500065000	15	Buckwheat	0.030000	1.000	1.000
1500066000	15	Buckwheat, flour	0.030000	1.000	1.000
1500120000	15	Corn, field, flour	0.030000	1.000	1.000
1500120001	15	Corn, field, flour-babyfood	0.030000	1.000	1.000
1500121000	15	Corn, field, meal	0.030000	1.000	1.000
1500121001	15	Corn, field, meal-babyfood	0.030000	1.000	1.000
1500122000	15	Corn, field, bran	0.030000	21.400	1.000
1500123000	15	Corn, field, starch	0.030000	1.000	1.000
1500123001	15	Corn, field, starch-babyfood	0.030000	1.000	1.000
1500124000	15	Corn, field, syrup	0.030000	1.000	1.000
1500124001	15	Corn, field, syrup-babyfood	0.030000	1.000	1.000
1500125000	15	Corn, field, oil	0.030000	1.000	1.000
1500125001	15	Corn, field, oil-babyfood	0.030000	1.000	1.000
1500126000	15	Corn, pop	0.030000	1.000	1.000
1500127000	15	Corn, sweet	0.030000	1.000	1.000
1500127001	15	Corn, sweet-babyfood	0.030000	1.000	1.000
1500226000	15	Millet, grain	0.030000	1.000	1.000
1500231000	15	Oat, bran	0.030000	7.700	1.000
1500232000	15	Oat, flour	0.030000	1.000	1.000
1500232001	15	Oat, flour-babyfood	0.030000	1.000	1.000
1500233000	15	Oat, groats/rolled oats	0.030000	1.000	1.000
1500233001	15	Oat, groats/rolled oats-babyfood	0.030000	1.000	1.000
1500323000	15	Rice, white	0.030000	1.000	1.000
1500323001	15	Rice, white-babyfood	0.030000	1.000	1.000
1500324000	15	Rice, brown	0.030000	1.250	1.000
1500324001	15	Rice, brown-babyfood	0.030000	1.250	1.000
1500325000	15	Rice, flour	0.030000	1.250	1.000
1500325001	15	Rice, flour-babyfood	0.030000	1.250	1.000
1500326000	15	Rice, bran	0.030000	1.000	1.000
1500326001	15	Rice, bran-babyfood	0.030000	1.000	1.000
1500328000	15	Rye, grain	0.030000	1.000	1.000
1500329000	15	Rye, flour	0.030000	1.000	1.000
1500344000	15	Sorghum, grain	0.030000	1.000	1.000
1500345000	15	Sorghum, syrup	0.030000	1.000	1.000
1500381000	15	Triticale, flour	0.600000	1.000	1.000
1500381001	15	Triticale, flour-babyfood	0.600000	1.000	1.000
1500401000	15	Wheat, grain	0.600000	1.000	1.000
1500401001	15	Wheat, grain-babyfood	0.600000	1.000	1.000
1500402000	15	Wheat, flour	0.600000	1.000	1.000
1500402001	15	Wheat, flour-babyfood	0.600000	1.000	1.000
1500403000	15	Wheat, germ	0.600000	1.000	1.000
1500404000	15	Wheat, bran	0.600000	1.000	1.000
1500405000	15	Wild rice	0.030000	1.000	1.000
1800002000	18	Alfalfa, seed	0.100000	1.000	1.000
2001163000	20A	Flax seed, oil	1.020000	2.200	1.000
2001319000	20A	Rapeseed, oil	1.020000	1.000	1.000
2001319001	20A	Rapeseed, oil-babyfood	1.020000	1.000	1.000
2001336000	20A	Sesame, seed	1.020000	1.000	1.000
2001336001	20A	Sesame, seed-babyfood	1.020000	1.000	1.000
2001337000	20A	Sesame, oil	1.020000	1.000	1.000
2001337001	20A	Sesame, oil-babyfood	1.020000	1.000	1.000
2002330000	20B	Safflower, oil	1.700000	1.000	1.000

2002330001	20B	Safflower, oil-babyfood	1.700000	1.000	1.000
2002364000	20B	Sunflower, seed	1.700000	1.000	1.000
2002365000	20B	Sunflower, oil	1.700000	1.000	1.000
2002365001	20B	Sunflower, oil-babyfood	1.700000	1.000	1.000
2003128000	20C	Cottonseed, oil	0.340000	1.000	1.000
2003128001	20C	Cottonseed, oil-babyfood	0.340000	1.000	1.000
2301235000	23A	Olive	0.030000	1.000	1.000
2301236000	23A	Olive, oil	0.030000	1.000	1.000
2302153000	23B	Fig	0.040000	1.000	1.000
2302154000	23B	Fig, dried	0.040000	1.000	1.000
2402023000	24B	Banana	0.030000	1.000	1.000
2402023001	24B	Banana-babyfood	0.030000	1.000	1.000
2402024000	24B	Banana, dried	0.030000	4.800	1.000
2402024001	24B	Banana, dried-babyfood	0.030000	4.800	1.000
2402215000	24B	Mango	0.030000	1.000	1.000
2402216000	24B	Mango, dried	0.030000	5.900	1.000
2402217000	24B	Mango, juice	0.030000	2.000	1.000
2402217001	24B	Mango, juice-babyfood	0.030000	2.000	1.000
2402283000	24B	Plantain	0.030000	1.000	1.000
2402284000	24B	Plantain, dried	0.030000	4.800	1.000
2402289000	24B	Pomegranate	0.030000	1.000	1.000
3100044000	31	Beef, meat	0.020000	1.000	1.000
3100044001	31	Beef, meat-babyfood	0.020000	1.000	1.000
3100045000	31	Beef, meat, dried	0.020000	1.920	1.000
3100046000	31	Beef, meat byproducts	0.300000	1.000	1.000
3100046001	31	Beef, meat byproducts-babyfood	0.300000	1.000	1.000
3100047000	31	Beef, fat	0.040000	1.000	1.000
3100047001	31	Beef, fat-babyfood	0.040000	1.000	1.000
3100048000	31	Beef, kidney	0.300000	1.000	1.000
3100049000	31	Beef, liver	50.000000	1.000	1.000
3100049001	31	Beef, liver-babyfood	50.000000	1.000	1.000
3200169000	32	Goat, meat	0.020000	1.000	1.000
3200170000	32	Goat, meat byproducts	0.300000	1.000	1.000
3200171000	32	Goat, fat	0.040000	1.000	1.000
3200172000	32	Goat, kidney	0.300000	1.000	1.000
3200173000	32	Goat, liver	50.000000	1.000	1.000
3300189000	33	Horse, meat	0.020000	1.000	1.000
3400290000	34	Pork, meat	0.010000	1.000	1.000
3400290001	34	Pork, meat-babyfood	0.010000	1.000	1.000
3400291000	34	Pork, skin	0.010000	1.000	1.000
3400292000	34	Pork, meat byproducts	0.020000	1.000	1.000
3400292001	34	Pork, meat byproducts-babyfood	0.020000	1.000	1.000
3400293000	34	Pork, fat	0.010000	1.000	1.000
3400293001	34	Pork, fat-babyfood	0.010000	1.000	1.000
3400294000	34	Pork, kidney	0.010000	1.000	1.000
3400295000	34	Pork, liver	2.000000	1.000	1.000
3500339000	35	Sheep, meat	0.020000	1.000	1.000
3500339001	35	Sheep, meat-babyfood	0.020000	1.000	1.000
3500340000	35	Sheep, meat byproducts	0.300000	1.000	1.000
3500341000	35	Sheep, fat	0.040000	1.000	1.000
3500341001	35	Sheep, fat-babyfood	0.040000	1.000	1.000
3500342000	35	Sheep, kidney	0.300000	1.000	1.000
3500343000	35	Sheep, liver	50.000000	1.000	1.000
3600222000	36	Milk, fat	0.010000	1.000	1.000
3600222001	36	Milk, fat-baby food/infant formu	0.010000	1.000	1.000
3600223000	36	Milk, nonfat solids	0.010000	1.000	1.000
3600223001	36	Milk, nonfat solids-baby food/in	0.010000	1.000	1.000
3600224000	36	Milk, water	0.010000	1.000	1.000
3600224001	36	Milk, water-babyfood/infant form	0.010000	1.000	1.000
3600225001	36	Milk, sugar (lactose)-baby food/	0.010000	1.000	1.000
3900312000	39	Rabbit, meat	0.010000	1.000	1.000
8000157000	80	Fish-freshwater finfish	0.010000	1.000	1.000
8000158000	80	Fish-freshwater finfish, farm ra	0.010000	1.000	1.000
8000159000	80	Fish-saltwater finfish, tuna	0.010000	1.000	1.000
8000160000	80	Fish-saltwater finfish, other	0.010000	1.000	1.000
8000161000	80	Fish-shellfish, crustacean	0.010000	1.000	1.000
8601000000	86A	Water, direct, all sources	0.133000	1.000	1.000
8602000000	86B	Water, indirect, all sources	0.133000	1.000	1.000
9500115000	O	Coffee, roasted bean	0.030000	1.000	1.000
9500116000	O	Coffee, instant	0.030000	1.000	1.000

9500177000	O	Grape, leaves	0.030000	1.000	1.000
9500275000	O	Peppermint	0.030000	1.000	1.000
9500276000	O	Peppermint, oil	0.030000	1.000	1.000
9500311000	O	Quinoa, grain	0.700000	1.000	1.000
9500352000	O	Spearmint	0.030000	1.000	1.000
9500353000	O	Spearmint, oil	0.030000	1.000	1.000
9500362000	O	Sugarcane, sugar	0.050000	1.000	1.000
9500362001	O	Sugarcane, sugar-babyfood	0.050000	1.000	1.000
9500363000	O	Sugarcane, molasses	0.080000	1.000	1.000
9500363001	O	Sugarcane, molasses-babyfood	0.080000	1.000	1.000

Attachment 2: DEEM-FCID Acute Exposure and Risk Estimates

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                                                                    Ver. 4.02, 05-10-c
DEEM-FCID ACUTE Analysis for SAFLUFENACIL  ON  MINT AND OTHERS
                                                                 NHANES 2005-2010 2-Day
Residue file: saflufenacil ACUTE.R10              Adjustment factor #2 NOT used.
Analysis Date: 10-06-2023/11:23:28    Residue file dated: 10-06-2023/11:15:44
RAC/FF intake summed over 24 hours
Run Comment: ""
================================================================================

Summary calculations--per capita:
```

	95th Percentile Exposure	95th Percentile % aRfD	99th Percentile Exposure	99th Percentile % aRfD	99.9th Percentile Exposure	99.9th Percentile % aRfD
Total US Population:						
	0.010215	0.20	0.017000	0.34	0.043557	0.87
All Infants:						
	0.029126	0.58	0.038583	0.77	0.050712	1.01
Children 1-2:						
	0.017401	0.35	0.038011	0.76	0.112438	2.25
Children 3-5:						
	0.013946	0.28	0.019359	0.39	0.032635	0.65
Children 6-12:						
	0.010698	0.21	0.015633	0.31	0.023199	0.46
Youth 13-19:						
	0.008265	0.17	0.012236	0.24	0.016607	0.33
Adults 20-49:						
	0.009143	0.18	0.013126	0.26	0.025954	0.52
Adults 50-99:						
	0.007698	0.15	0.011621	0.23	0.041974	0.84
Female 13-49:						
	0.008880	0.18	0.012493	0.25	0.026069	0.52

Attachment 3: DEEM-FCID Chronic Residue File

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Filename: C:\Models\318\SAFLUFENACIL R.10 FILES\CHRONIC.R10
Chemical: Saflufenacil DRA
RfD(Chronic): .046 mg/kg bw/day  NOEL(Chronic): 0 mg/kg bw/day
RfD(Acute): 5 mg/kg bw/day  NOEL(Acute):  0 mg/kg bw/day
Date created/last modified: 10-06-2023/10:36:52       Program ver. 4.02, 05-10-c
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EPA Code	Crop Grp	Commodity Name	Def Res (ppm)	Adj.Factors #1	#2	Comment
0600347000	6	Soybean, seed	0.510000	1.000	1.000	
0600348000	6	Soybean, flour	0.300000	2.200	1.000	
0600348001	6	Soybean, flour-babyfood	0.300000	2.200	1.000	
0600349000	6	Soybean, soy milk	0.510000	1.000	1.000	
0600349001	6	Soybean, soy milk-babyfood or in	0.510000	1.000	1.000	
0600350000	6	Soybean, oil	0.510000	1.000	1.000	
0600350001	6	Soybean, oil-babyfood	0.510000	1.000	1.000	
0601043000	6A	Bean, snap, succulent	0.030000	1.000	1.000	
0601043001	6A	Bean, snap, succulent-babyfood	0.030000	1.000	1.000	
0601257000	6A	Pea, edible podded, succulent	0.030000	1.000	1.000	
0601349500	6AB	Soybean, vegetable	0.030000	1.000	1.000	
0602031000	6B	Bean, broad, succulent	0.030000	1.000	1.000	
0602033000	6B	Bean, cowpea, succulent	0.030000	1.000	1.000	
0602037000	6B	Bean, lima, succulent	0.030000	1.000	1.000	
0602255000	6B	Pea, succulent	0.030000	1.000	1.000	
0602255001	6B	Pea, succulent-babyfood	0.030000	1.000	1.000	
0602259000	6B	Pea, pigeon, succulent	0.030000	1.000	1.000	
0603030000	6C	Bean, black, seed	0.510000	1.000	1.000	
0603032000	6C	Bean, broad, seed	0.510000	1.000	1.000	
0603034000	6C	Bean, cowpea, seed	0.510000	1.000	1.000	
0603035000	6C	Bean, great northern, seed	0.510000	1.000	1.000	
0603036000	6C	Bean, kidney, seed	0.510000	1.000	1.000	
0603038000	6C	Bean, lima, seed	0.510000	1.000	1.000	
0603039000	6C	Bean, mung, seed	0.510000	1.000	1.000	
0603040000	6C	Bean, navy, seed	0.510000	1.000	1.000	
0603041000	6C	Bean, pink, seed	0.510000	1.000	1.000	
0603042000	6C	Bean, pinto, seed	0.510000	1.000	1.000	
0603098000	6C	Chickpea, seed	0.510000	1.000	1.000	
0603098001	6C	Chickpea, seed-babyfood	0.510000	1.000	1.000	
0603099000	6C	Chickpea, flour	0.510000	1.000	1.000	
0603182000	6C	Guar, seed	0.510000	1.000	1.000	
0603182001	6C	Guar, seed-babyfood	0.510000	1.000	1.000	
0603203000	6C	Lentil, seed	0.510000	1.000	1.000	
0603256000	6C	Pea, dry	0.510000	1.000	1.000	
0603256001	6C	Pea, dry-babyfood	0.510000	1.000	1.000	
0603258000	6C	Pea, pigeon, seed	0.510000	1.000	1.000	
1001106000	10A	Citron	0.030000	1.000	1.000	
1001107000	10A	Citrus hybrids	0.030000	1.000	1.000	
1001108000	10A	Citrus, oil	0.030000	1.000	1.000	
1001240000	10A	Orange	0.030000	1.000	1.000	
1001241000	10A	Orange, juice	0.030000	2.000	1.000	
1001241001	10A	Orange, juice-babyfood	0.030000	2.000	1.000	
1001242000	10A	Orange, peel	0.030000	3.300	1.000	
1001369000	10A	Tangerine	0.030000	1.000	1.000	
1001370000	10A	Tangerine, juice	0.030000	2.300	1.000	
1002197000	10B	Kumquat	0.030000	1.000	1.000	
1002199000	10B	Lemon	0.030000	1.000	1.000	
1002200000	10B	Lemon, juice	0.030000	2.000	1.000	
1002200001	10B	Lemon, juice-babyfood	0.030000	2.000	1.000	
1002201000	10B	Lemon, peel	0.030000	3.300	1.000	
1002206000	10B	Lime	0.030000	1.000	1.000	
1002207000	10B	Lime, juice	0.030000	2.000	1.000	
1002207001	10B	Lime, juice-babyfood	0.030000	2.000	1.000	
1003180000	10C	Grapefruit	0.030000	1.000	1.000	
1003181000	10C	Grapefruit, juice	0.030000	2.100	1.000	
1003307000	10C	Pummelo	0.030000	1.000	1.000	
1100007000	11	Apple, fruit with peel	0.030000	1.000	1.000	
1100008000	11	Apple, peeled fruit	0.030000	1.000	1.000	

1100008001	11	Apple, peeled fruit-babyfood	0.030000	1.000	1.000
1100009000	11	Apple, dried	0.030000	8.000	1.000
1100009001	11	Apple, dried-babyfood	0.030000	8.000	1.000
1100010000	11	Apple, juice	0.030000	1.300	1.000
1100010001	11	Apple, juice-babyfood	0.030000	1.300	1.000
1100011000	11	Apple, sauce	0.030000	1.000	1.000
1100011001	11	Apple, sauce-babyfood	0.030000	1.000	1.000
1100129000	11	Crabapple	0.030000	1.000	1.000
1100210000	11	Loquat	0.030000	1.000	1.000
1100266000	11	Pear	0.030000	1.000	1.000
1100266001	11	Pear-babyfood	0.030000	1.000	1.000
1100267000	11	Pear, dried	0.030000	6.250	1.000
1100268000	11	Pear, juice	0.030000	1.300	1.000
1100268001	11	Pear, juice-babyfood	0.030000	1.300	1.000
1100310000	11	Quince	0.030000	1.000	1.000
1201090000	12A	Cherry	0.030000	1.000	1.000
1201090001	12A	Cherry-babyfood	0.030000	1.000	1.000
1201091000	12A	Cherry, juice	0.030000	1.500	1.000
1201091001	12A	Cherry, juice-babyfood	0.030000	1.500	1.000
1202012000	12B	Apricot	0.030000	1.000	1.000
1202012001	12B	Apricot-babyfood	0.030000	1.000	1.000
1202013000	12B	Apricot, dried	0.030000	6.000	1.000
1202014000	12B	Apricot, juice	0.030000	1.300	1.000
1202014001	12B	Apricot, juice-babyfood	0.030000	1.300	1.000
1202230000	12B	Nectarine	0.030000	1.000	1.000
1202260000	12B	Peach	0.030000	1.000	1.000
1202260001	12B	Peach-babyfood	0.030000	1.000	1.000
1202261000	12B	Peach, dried	0.030000	7.000	1.000
1202261001	12B	Peach, dried-babyfood	0.030000	7.000	1.000
1202262000	12B	Peach, juice	0.030000	1.300	1.000
1202262001	12B	Peach, juice-babyfood	0.030000	1.300	1.000
1203285000	12C	Plum	0.030000	1.000	1.000
1203285001	12C	Plum-babyfood	0.030000	1.000	1.000
1203286000	12C	Plum, prune, fresh	0.030000	1.000	1.000
1203286001	12C	Plum, prune, fresh-babyfood	0.030000	1.000	1.000
1203287000	12C	Plum, prune, dried	0.030000	5.000	1.000
1203287001	12C	Plum, prune, dried-babyfood	0.030000	5.000	1.000
1203288000	12C	Plum, prune, juice	0.030000	1.400	1.000
1203288001	12C	Plum, prune, juice-babyfood	0.030000	1.400	1.000
1301055000	13A	Blackberry	0.040000	1.000	1.000
1301056000	13A	Blackberry, juice	0.040000	1.200	1.000
1301056001	13A	Blackberry, juice-babyfood	0.040000	1.200	1.000
1301058000	13A	Boysenberry	0.040000	1.000	1.000
1301208000	13A	Loganberry	0.040000	1.000	1.000
1301320000	13A	Raspberry	0.040000	1.000	1.000
1301320001	13A	Raspberry-babyfood	0.040000	1.000	1.000
1301321000	13A	Raspberry, juice	0.040000	1.200	1.000
1301321001	13A	Raspberry, juice-babyfood	0.040000	1.200	1.000
1304175000	13D	Grape	0.030000	1.000	1.000
1304176000	13D	Grape, juice	0.030000	1.000	1.000
1304176001	13D	Grape, juice-babyfood	0.030000	1.000	1.000
1304178000	13D	Grape, raisin	0.030000	4.300	1.000
1304179000	13D	Grape, wine and sherry	0.030000	1.000	1.000
1304195000	13D	Kiwifruit, fuzzy	0.030000	1.000	1.000
1400003000	14	Almond	0.030000	1.000	1.000
1400003001	14	Almond-babyfood	0.030000	1.000	1.000
1400004000	14	Almond, oil	0.030000	2.800	1.000
1400004001	14	Almond, oil-babyfood	0.030000	2.800	1.000
1400059000	14	Brazil nut	0.030000	1.000	1.000
1400068000	14	Butternut	0.030000	1.000	1.000
1400081000	14	Cashew	0.030000	1.000	1.000
1400092000	14	Chestnut	0.030000	1.000	1.000
1400111000	14	Coconut, meat	0.030000	1.000	1.000
1400111001	14	Coconut, meat-babyfood	0.030000	1.000	1.000
1400112000	14	Coconut, dried	0.030000	1.000	1.000
1400113000	14	Coconut, milk	0.030000	1.000	1.000
1400114000	14	Coconut, oil	0.030000	1.000	1.000
1400114001	14	Coconut, oil-babyfood	0.030000	1.000	1.000
1400155000	14	Hazelnut	0.030000	1.000	1.000
1400156000	14	Hazelnut, oil	0.030000	1.800	1.000

1400185000	14	Hickory nut	0.030000	1.000	1.000
1400213000	14	Macadamia nut	0.030000	1.000	1.000
1400269000	14	Pecan	0.030000	1.000	1.000
1400278000	14	Pine nut	0.030000	1.000	1.000
1400282000	14	Pistachio	0.030000	1.000	1.000
1400391000	14	Walnut	0.030000	1.000	1.000
1500025000	15	Barley, pearled barley	1.000000	1.000	1.000
1500025001	15	Barley, pearled barley-babyfood	1.000000	1.000	1.000
1500026000	15	Barley, flour	1.000000	1.000	1.000
1500026001	15	Barley, flour-babyfood	1.000000	1.000	1.000
1500027000	15	Barley, bran	1.500000	1.000	1.000
1500065000	15	Buckwheat	0.030000	1.000	1.000
1500066000	15	Buckwheat, flour	0.030000	1.000	1.000
1500120000	15	Corn, field, flour	0.030000	1.000	1.000
1500120001	15	Corn, field, flour-babyfood	0.030000	1.000	1.000
1500121000	15	Corn, field, meal	0.030000	1.000	1.000
1500121001	15	Corn, field, meal-babyfood	0.030000	1.000	1.000
1500122000	15	Corn, field, bran	0.030000	21.400	1.000
1500123000	15	Corn, field, starch	0.030000	1.000	1.000
1500123001	15	Corn, field, starch-babyfood	0.030000	1.000	1.000
1500124000	15	Corn, field, syrup	0.030000	1.000	1.000
1500124001	15	Corn, field, syrup-babyfood	0.030000	1.000	1.000
1500125000	15	Corn, field, oil	0.030000	1.000	1.000
1500125001	15	Corn, field, oil-babyfood	0.030000	1.000	1.000
1500126000	15	Corn, pop	0.030000	1.000	1.000
1500127000	15	Corn, sweet	0.030000	1.000	1.000
1500127001	15	Corn, sweet-babyfood	0.030000	1.000	1.000
1500226000	15	Millet, grain	0.030000	1.000	1.000
1500231000	15	Oat, bran	0.030000	7.700	1.000
1500232000	15	Oat, flour	0.030000	1.000	1.000
1500232001	15	Oat, flour-babyfood	0.030000	1.000	1.000
1500233000	15	Oat, groats/rolled oats	0.030000	1.000	1.000
1500233001	15	Oat, groats/rolled oats-babyfood	0.030000	1.000	1.000
1500323000	15	Rice, white	0.030000	1.000	1.000
1500323001	15	Rice, white-babyfood	0.030000	1.000	1.000
1500324000	15	Rice, brown	0.030000	1.250	1.000
1500324001	15	Rice, brown-babyfood	0.030000	1.250	1.000
1500325000	15	Rice, flour	0.030000	1.250	1.000
1500325001	15	Rice, flour-babyfood	0.030000	1.250	1.000
1500326000	15	Rice, bran	0.030000	1.000	1.000
1500326001	15	Rice, bran-babyfood	0.030000	1.000	1.000
1500328000	15	Rye, grain	0.030000	1.000	1.000
1500329000	15	Rye, flour	0.030000	1.000	1.000
1500344000	15	Sorghum, grain	0.030000	1.000	1.000
1500345000	15	Sorghum, syrup	0.030000	1.000	1.000
1500381000	15	Triticale, flour	0.600000	1.000	1.000
1500381001	15	Triticale, flour-babyfood	0.600000	1.000	1.000
1500401000	15	Wheat, grain	0.600000	1.000	1.000
1500401001	15	Wheat, grain-babyfood	0.600000	1.000	1.000
1500402000	15	Wheat, flour	0.600000	1.000	1.000
1500402001	15	Wheat, flour-babyfood	0.600000	1.000	1.000
1500403000	15	Wheat, germ	0.600000	1.000	1.000
1500404000	15	Wheat, bran	0.600000	1.000	1.000
1500405000	15	Wild rice	0.030000	1.000	1.000
1800002000	18	Alfalfa, seed	0.100000	1.000	1.000
2001162900	20A	Flax, seed	1.020000	1.000	1.000
2001163000	20A	Flax seed, oil	1.020000	2.200	1.000
2001319000	20A	Rapeseed, oil	1.020000	1.000	1.000
2001319001	20A	Rapeseed, oil-babyfood	1.020000	1.000	1.000
2001336000	20A	Sesame, seed	1.020000	1.000	1.000
2001336001	20A	Sesame, seed-babyfood	1.020000	1.000	1.000
2001337000	20A	Sesame, oil	1.020000	1.000	1.000
2001337001	20A	Sesame, oil-babyfood	1.020000	1.000	1.000
2002330000	20B	Safflower, oil	1.700000	1.000	1.000
2002330001	20B	Safflower, oil-babyfood	1.700000	1.000	1.000
2002364000	20B	Sunflower, seed	1.700000	1.000	1.000
2002365000	20B	Sunflower, oil	1.700000	1.000	1.000
2002365001	20B	Sunflower, oil-babyfood	1.700000	1.000	1.000
2003128000	20C	Cottonseed, oil	0.340000	1.000	1.000
2003128001	20C	Cottonseed, oil-babyfood	0.340000	1.000	1.000

2301235000	23A	Olive	0.030000	1.000	1.000
2301236000	23A	Olive, oil	0.030000	1.000	1.000
2302153000	23B	Fig	0.040000	1.000	1.000
2302154000	23B	Fig, dried	0.040000	1.000	1.000
2402023000	24B	Banana	0.030000	1.000	1.000
2402023001	24B	Banana-babyfood	0.030000	1.000	1.000
2402024000	24B	Banana, dried	0.030000	4.800	1.000
2402024001	24B	Banana, dried-babyfood	0.030000	4.800	1.000
2402215000	24B	Mango	0.030000	1.000	1.000
2402216000	24B	Mango, dried	0.030000	5.900	1.000
2402217000	24B	Mango, juice	0.030000	2.000	1.000
2402217001	24B	Mango, juice-babyfood	0.030000	2.000	1.000
2402283000	24B	Plantain	0.030000	1.000	1.000
2402284000	24B	Plantain, dried	0.030000	4.800	1.000
2402289000	24B	Pomegranate	0.030000	1.000	1.000
3100044000	31	Beef, meat	0.020000	1.000	1.000
3100044001	31	Beef, meat-babyfood	0.020000	1.000	1.000
3100045000	31	Beef, meat, dried	0.020000	1.920	1.000
3100046000	31	Beef, meat byproducts	0.300000	1.000	1.000
3100046001	31	Beef, meat byproducts-babyfood	0.300000	1.000	1.000
3100047000	31	Beef, fat	0.050000	1.000	1.000
3100047001	31	Beef, fat-babyfood	0.040000	1.000	1.000
3100048000	31	Beef, kidney	0.300000	1.000	1.000
3100049000	31	Beef, liver	50.000000	1.000	1.000
3100049001	31	Beef, liver-babyfood	50.000000	1.000	1.000
3200169000	32	Goat, meat	50.000000	1.000	1.000
3200170000	32	Goat, meat byproducts	0.300000	1.000	1.000
3200171000	32	Goat, fat	0.040000	1.000	1.000
3200172000	32	Goat, kidney	0.300000	1.000	1.000
3200173000	32	Goat, liver	50.000000	1.000	1.000
3300189000	33	Horse, meat	0.020000	1.000	1.000
3400290000	34	Pork, meat	0.010000	1.000	1.000
3400290001	34	Pork, meat-babyfood	0.010000	1.000	1.000
3400291000	34	Pork, skin	0.010000	1.000	1.000
3400292000	34	Pork, meat byproducts	0.020000	1.000	1.000
3400292001	34	Pork, meat byproducts-babyfood	0.020000	1.000	1.000
3400293000	34	Pork, fat	0.010000	1.000	1.000
3400293001	34	Pork, fat-babyfood	0.010000	1.000	1.000
3400294000	34	Pork, kidney	0.020000	1.000	1.000
3400295000	34	Pork, liver	2.000000	1.000	1.000
3500339000	35	Sheep, meat	0.020000	1.000	1.000
3500339001	35	Sheep, meat-babyfood	0.020000	1.000	1.000
3500340000	35	Sheep, meat byproducts	0.300000	1.000	1.000
3500341000	35	Sheep, fat	0.040000	1.000	1.000
3500341001	35	Sheep, fat-babyfood	0.040000	1.000	1.000
3500342000	35	Sheep, kidney	0.300000	1.000	1.000
3500343000	35	Sheep, liver	50.000000	1.000	1.000
3600222000	36	Milk, fat	0.010000	1.000	1.000
3600222001	36	Milk, fat-baby food/infant formu	0.010000	1.000	1.000
3600223000	36	Milk, nonfat solids	0.010000	1.000	1.000
3600223001	36	Milk, nonfat solids-baby food/in	0.010000	1.000	1.000
3600224000	36	Milk, water	0.010000	1.000	1.000
3600224001	36	Milk, water-babyfood/infant form	0.010000	1.000	1.000
3600225001	36	Milk, sugar (lactose)-baby food/	0.010000	1.000	1.000
3900312000	39	Rabbit, meat	0.010000	1.000	1.000
8000157000	80	Fish-freshwater finfish	0.010000	1.000	1.000
8000158000	80	Fish-freshwater finfish, farm ra	0.010000	1.000	1.000
8000159000	80	Fish-saltwater finfish, tuna	0.010000	1.000	1.000
8000160000	80	Fish-saltwater finfish, other	0.010000	1.000	1.000
8000161000	80	Fish-shellfish, crustacean	0.010000	1.000	1.000
8601000000	86A	Water, direct, all sources	0.120000	1.000	1.000
8602000000	86B	Water, indirect, all sources	0.120000	1.000	1.000
9500115000	O	Coffee, roasted bean	0.030000	1.000	1.000
9500116000	O	Coffee, instant	0.030000	1.000	1.000
9500177000	O	Grape, leaves	0.030000	1.000	1.000
9500275000	O	Peppermint	0.030000	1.000	1.000
9500276000	O	Peppermint, oil	0.030000	1.000	1.000
9500311000	O	Quinoa, grain	0.700000	1.000	1.000
9500352000	O	Spearmint	0.030000	1.000	1.000
9500353000	O	Spearmint, oil	0.030000	1.000	1.000

9500362000	O	Sugarcane, sugar	0.050000	1.000	1.000
9500362001	O	Sugarcane, sugar-babyfood	0.050000	1.000	1.000
9500363000	O	Sugarcane, molasses	0.080000	1.000	1.000
9500363001	O	Sugarcane, molasses-babyfood	0.080000	1.000	1.000

Attachment 4: DEEM-FCID Chronic Exposure and Risk Estimates

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Evaluation Copy                                                  Ver. 4.02, 05-10-c
DEEM-FCID Chronic analysis for SAFLUFENACIL DRA            NHANES 2005-2010 2-day
Residue file name: C:\Models\318\SAFLUFENACIL R.10 FILES\CHRONIC.R10
                                                 Adjustment factor #2 NOT used.
Analysis Date 10-06-2023/11:19:09     Residue file dated: 10-06-2023/11:18:41
Reference dose (RfD, Chronic) = .046 mg/kg bw/day
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                  Total exposure by population subgroup
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Population Subgroup	Total Exposure mg/kg body wt/day	Total Exposure Percent of Rfd
Total US Population	0.004296	9.3%
Hispanic	0.004358	9.5%
Non-Hisp-White	0.004289	9.3%
Non-Hisp-Black	0.003852	8.4%
Non-Hisp-Other	0.005159	11.2%
Nursing Infants	0.003954	8.6%
Non-Nursing Infants	0.015667	34.1%
Female 13+ PREG	0.004226	9.2%
Children 1-6	0.007659	16.7%
Children 7-12	0.004557	9.9%
Male 13-19	0.003401	7.4%
Female 13-19/NP	0.003353	7.3%
Male 20+	0.003901	8.5%
Female 20+/NP	0.003784	8.2%
Seniors 55+	0.003540	7.7%
All Infants	0.011983	26.1%
Female 13-50	0.003789	8.2%
Children 1-2	0.008557	18.6%
Children 3-5	0.007414	16.1%
Children 6-12	0.004839	10.5%
Youth 13-19	0.003377	7.3%
Adults 20-49	0.003982	8.7%
Adults 50-99	0.003663	8.0%
Female 13-49	0.003784	8.2%

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