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**UNITED STATES ENVIRONMENTAL PROTECTION AGENCY**

**WASHINGTON, D.C. 20460**



**OFFICE OF  
PREVENTION, PESTICIDES  
AND TOXIC SUBSTANCES**

**MEMORANDUM**

DATE: 08 - JAN-2007

SUBJECT: **Lactofen** Acute, Chronic, and Cancer Aggregate Dietary and Drinking Water Exposure and Risk Assessments for the Section 3 Registration Action

PC Code: 128888  
DP Number: D333149

Decision Number: 356302

REVIEWER: Christine L. Olinger, Chemist  
Reregistration Branch 1  
Health Effects Division (7509P)

THROUGH: Douglas Dotson, Chemist  
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Dietary Exposure Science Advisory Council (DESAC)  
Health Effects Division (7509P)

And

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TO: Barbara Madden  
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## **Executive Summary**

Acute, chronic, and cancer dietary risk assessments were conducted using the Dietary Exposure Evaluation Model (DEEM-FCID™, Version [2.03]) which uses food consumption data from the U.S. Department of Agriculture's Continuing Surveys of Food Intakes by Individuals (CSFII) from 1994-1996 and 1998. The analyses were performed to support a request for regional registration of lactofen on fruiting vegetables and okra.

All of the assessments assumed tolerance level residues of lactofen in all commodities and that all commodities consumed were treated. The dietary exposures for food alone and food and drinking water are well below the level of concern for all populations for acute and chronic exposures. This is a highly conservative assessment and actual exposure is likely to be lower.

Acifluorfen, a registered herbicide, is an environmental degradate of lactofen and may be found in drinking water as a result of lactofen applications. Therefore, aggregate acute and chronic assessments were conducted assuming tolerance level residues of acifluorfen and modeled estimates of acifluorfen in drinking water as a result of application of lactofen. All of the exposure estimates were below the level of concern for all populations.

## **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 which 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 reference dose (RfD) divided by the Food Quality Protection Act (FQPA) Safety Factor.

For acute and non-cancer chronic exposures, HED is concerned when estimated dietary risk exceeds 100% of the PAD. HED is generally concerned when estimated cancer risk exceeds one in one million (i.e., the risk exceeds  $1 \times 10^{-6}$ ). References which 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," 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 most recent dietary risk assessment for lactofen was conducted by Felecia Fort (10/30/02, DP 269311).

## II. Residue Information

Lactofen is an early season herbicide currently registered for use on cottonseed, peanuts, snap beans and soybeans. The tolerances are listed in 40 CFR 180.432 and were reassessed in 2003. On April 4, 2000, the Metabolism Assessment Review Committee (MARC) determined that the dietary analysis should be based on the parent, lactofen only.

### Residue Data used for Acute, Chronic, and/or Cancer Assessments:

Tolerance levels were used in the acute, chronic, and cancer assessments for lactofen and are listed in Table 1 below.

Table 1. Tolerance Levels Used in Lactofen Dietary Assessment	
Crop	Tolerance Level, ppm
<b>Existing Tolerances</b>	
Beans, Snap	0.01
Cotton, Gin Byproducts	0.02
Cotton, undelinted seed	0.01
Peanut	0.01
Soybean, seed	0.01
<b>Proposed Tolerances</b>	
Fruiting Vegetables	0.02
Okra	0.02

An aggregate assessment for acifluorfen was also conducted because acifluorfen is an environmental degradate of lactofen. Tolerance values for acifluorfen (40 CFR § 180.383) were used and may be found in Table 2.

Table 2. Tolerance Levels Used in Acifluorfen Dietary Assessment	
Crop	Tolerance Level, ppm
Peanut	0.1
Rice, grain	0.1
Soybean	0.1
Strawberry	0.05

No concentration, reduction, or processing factors were used in this assessment, as concentration of residues was not observed in processing studies. Although a tomato processing study was not submitted for lactofen, no residues were detected in exaggerated rate field trials. Therefore, residues exceeding the proposed tolerance would not be expected in tomato processed commodities.

### III. Drinking Water Data

The drinking water residues used in the dietary risk assessment were provided by the Environmental Fate and Effects Division (EFED) in the following memorandum: “Drinking water and aquatic exposure water assessments for IR4 Tolerance petition for the new use (R17) of lactofen on the fruiting vegetable group and okra.” (J. Wolf, D319594, 10/13/06) and incorporated directly into this dietary assessment. Acifluorfen is an environmental degradate of lactofen that could potentially be found in drinking water, and is also an environmental degradate of another registered herbicide, sodium acifluorfen. Therefore, EFED estimated drinking water concentrations for both lactofen and acifluorfen from lactofen applications, and acifluorfen from sodium acifluorfen applications. However, only the contribution from lactofen applications was incorporated into the acifluorfen aggregate assessment as lactofen and sodium acifluorfen are not likely to be used in the same area and the estimated concentrations from the proposed new uses of lactofen were higher than the sodium acifluorfen estimates. Water residues were incorporated in the DEEM-FCID into the food categories “water, direct, all sources” and “water, indirect, all sources.”

The Tier 2 surface water estimated drinking water concentrations (EDWCs) for lactofen and acifluorfen (a degradate of lactofen) were generated with standard Florida pepper and Florida tomato cropping scenarios using PRZM3 and EXAMS, and may be found in Table 3. PRZM simulates pesticide fate and transport as a result of leaching, direct spray drift, runoff and erosion from an agricultural field and EXAMS estimates environmental fate and transport of pesticides in a surface water body for a 30-year period (1961-1990). PRZM and EXAMS were linked by the program PE4-PL (version 01). The EDWC assessment for surface water uses single or multiple sites which typically represent a high-end exposure scenario from pesticide use on a particular cropped or non-cropped site. Ground-water concentrations were estimated using the Tier 1 screening model SCI-GROW and may be found in Table 4. The model and its description are available at the EPA internet site: <http://www.epa.gov/oppefed1/models/water/>.

Crop	Chemical Species	1-in-10 year Maximum/mean (µg/L)		Long term average Mean (30 yrs.) (µg/L)
		Acute	Chronic	Cancer
Pepper	Lactofen	<b>1.48</b>	0.040	0.033
	Acifluorfen	<b>22.5</b>	3.5	<b>2.0</b>
Tomato	Lactofen	1.13	<b>0.044</b>	<b>0.039</b>
	Acifluorfen	20.9	<b>3.9</b>	1.7

Estimated drinking water concentrations (EDWC) (µg/L) were estimated using linked PRZM/EXAMS and Index Reservoir (IR) and Percent Crop Area (PCA) for surface water. Bolded values were incorporated into the dietary exposure model

Table 4. SCI-GROW Estimates Of Lactofen And Acifluorfen EDWCs In Ground Water From Application of Lactofen	
Chemical	Acute and Chronic (µg/L)
Lactofen	0.006
Acifluorfen	2.00

#### IV. DEEM-FCID™ Program and Consumption Information

Lactofen and acifluorfen acute, chronic, and cancer dietary exposure assessments were conducted using the Dietary Exposure Evaluation Model software with the Food Commodity Intake Database (DEEM-FCID™, Version 2.03), which incorporates consumption data from USDA’s Continuing Surveys of Food Intakes by Individuals (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. For chronic exposure assessment, consumption data are averaged for the entire U.S. population and within population subgroups, but for acute exposure assessment are retained as individual consumption events. Based on analysis of the 1994-96, 98 CSFII 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+ years old.

For 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 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 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

all tiers of analysis. However, for tiers 1 and 2, any significant differences in user vs. per capita exposure and risk are specifically identified and noted in the risk assessment.

## V. Toxicological Information

On February 22, 2000 the Health Effects Division (HED) Hazard Identification Assessment Review Committee (HIARC) evaluated the toxicology database for lactofen, re-assessed the existing reference dose, and selected the doses and toxicological endpoints for dietary and non-dietary exposure risk assessments (C. Olinger, D269621, 10/12/00). A summary of the doses and toxicity endpoints selected for use in the various human health risk assessments for lactofen is presented in Table 5.

In response to the preliminary risk assessment for the Tolerance Reassessment Decision, the registrant submitted a proposed mechanism of toxicity for the carcinogenicity observed in the chronic rodent studies. The Mechanism of Toxicity Assessment Review Committee (MTARC) determined that the carcinogenicity should be assessed using a margin of exposure approach (Robert F. Fricke, 3/12/2001, DP Barcode: D267472). The Cancer Assessment Review Committee (CARC) concurred with the MTARC's conclusion and classified lactofen as likely to be carcinogenic to humans at high enough doses to cause the biochemical and histopathological changes in the liver of rodents, but unlikely to be carcinogenic to humans below doses causing these changes.

<b>Exposure Scenario</b>	<b>Dose Used in Risk Assessment, UF</b>	<b>Hazard and Exposure Based FQPA Safety Factor</b>	<b>Study and Toxicological Effects</b>
Acute Dietary <i>General US pop.</i>	No endpoint has been identified for the general population based on a single exposure to lactofen.		
Acute Dietary <i>Females (13+ years old)</i>	LOAEL = 5 mg/kg/day Acute RfD = 0.017 mg/kg/day <b>aPAD = 0.017 mg/kg/day</b>	UF = <b>100</b> FQPA SF= <b>3x</b> (use of a LOAEL to extrapolate a NOAEL)	Developmental Toxicity Study – Rabbit LOAEL was 5 mg/kg based on decrease in live young per litter accompanied by increases in post implantation loss and in early embryonic death/litter.
Chronic Dietary <i>All Populations</i>	NOAEL= <b>0.79</b> mg/kg/day UF = <b>100</b> <b>Chronic RfD = 0.008</b> mg/kg/day	FQPA SF = <b>1</b> <b>cPAD = 0.008</b> mg/kg/day	Chronic Oral Toxicity Study - Dog LOAEL = 3.96 mg/kg/day based on Increased incidence of proteinaceous casts in the kidneys and statistically significant decreases in the absolute weight of thyroid and adrenal glands in males.
Cancer	Classification: Not likely to be carcinogenic to humans at doses that do not cause the biochemical and histopathological changes in the liver of rodents. The chronic endpoint is protective of the carcinogenic effects so a separate cancer assessment is not needed.		

The toxicological endpoints for acute and chronic dietary exposures are discussed in detail in the revised Health Effects chapter to the Sodium Acifluorfen RED (K. Farwell, 1/15/2002, DP Barcode D279497) and are found in Table 6. Like lactofen, the cancer classification for acifluorfen was changed as a result of the submission of mechanistic studies and is now assessed using an MOE approach (K. Farwell, 7/13/2003, DP Barcode D291742)

<b>Table 6. Summary of Toxicological Doses and Endpoints for Acifluorfen for Use in Dietary Exposure Assessment</b>			
<b>Exposure Scenario</b>	<b>Dose Used in Risk Assessment, UF</b>	<b>Hazard and Exposure Based FQPA Safety Factor</b>	<b>Study and Toxicological Effects</b>
Acute Dietary <i>General US pop.</i>	No endpoint has been identified for the general population based on a single exposure to acifluorfen.		
Acute Dietary <i>Females (13+ years old)</i>	NOAEL = <b>20</b> mg/kg/day UF = <b>100</b> <b>Acute RfD = 0.2</b> mg/kg/day	FQPA SF = <b>10</b> aPAD = 0.02 mg/kg/day (database uncertainty factor for lack of developmental neurotoxicity study)	Developmental Toxicity Study – Rabbit LOAEL = 90 mg/kg/day based on Decreased fetal weight and increased incidences of dilated lateral ventricles of the brain.
Chronic Dietary <i>All Populations</i>	NOAEL= <b>1.25</b> mg/kg/day Chronic RfD = 0.013 mg/kg/day cPAD = 0.0013 mg/kg/day	FQPA SF = <b>10</b> UF <sub>A</sub> = 10x UF <sub>H</sub> = 10x FQPA SF= 10x (database uncertainty factor for lack of developmental neurotoxicity study)	2- Generation Reproduction Study - Rat LOAEL = 25 mg/kg/day based on Kidney lesions (dilatation of tubules in outer medulla)
Cancer	Not likely to be carcinogenic to humans at doses that do not cause biochemical and histopathological changes in livers of. The chronic endpoint is protective of the carcinogenic effects so a separate cancer assessment is not needed.		

## VI. Results/Discussion

As stated above, for acute and chronic assessments, HED is concerned when dietary risk exceeds 100% of the PAD. The DEEM-FCID™ analyses estimate the dietary exposure of the U.S. population and various population subgroups. The results reported in Table(s) 7, 8, and 9 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+ years.

Results of Acute Dietary Exposure Analysis

No endpoints were identified for the general population so the only assessment was conducted for Females ages 13-49. The results of the acute dietary exposure analyses for lactofen are reported in Tables 7 for food alone and Table 8 for food and drinking water. The results of the acute dietary exposure analyses for acifluorfen are reported in Table 9 for food (from acifluorfen applications and drinking water (as an environmental degradate of lactofen). All exposures are below the level of concern, with the lactofen assessments at less than 1% of the aPAD and the acifluorfen assessment at 6% of the aPAD.

Results of Chronic Dietary Exposure Analysis

The results of the chronic dietary exposure analyses for lactofen are reported in Tables 7 for food alone and Table 8 for food and drinking water. The results of the chronic dietary exposure analyses for acifluorfen are reported in Table 9 for food (from acifluorfen applications and drinking water (as an environmental degradate of lactofen). All exposures are below the level of concern, with the lactofen assessments at less than 1% of the aPAD. The most highly exposed subgroup in the acifluorfen assessment at 37% of the cPAD was infants, less than one year old.

<b>Table 7. Summary of Dietary Exposure and Risk for Lactofen – Food Only</b>				
Population Subgroup	Acute Dietary (95 <sup>th</sup> Percentile)		Chronic Dietary	
	Dietary Exposure (mg/kg/day)	% aPAD	Dietary Exposure (mg/kg/day)	% cPAD
General U.S. Population	N/A	N/A	0.000024	<1
All Infants (< 1 year old)			0.000024	<1
Children 1-2 years old			0.000051	<1
Children 3-5 years old			0.000047	<1
Children 6-12 years old			0.000032	<1
Youth 13-19 years old			0.000022	<1
Adults 20-49 years old			0.000021	<1
Adults 50+ years old			0.000019	<1
<b>Females 13-49 years old</b>			<b>0.000066</b>	<1

**Table 8. Summary of Dietary Exposure and Risk for Lactofen – Food and Drinking Water**

Population Subgroup	Acute Dietary (95 <sup>th</sup> Percentile)		Chronic Dietary	
	Dietary Exposure (mg/kg/day)	% aPAD	Dietary Exposure (mg/kg/day)	% cPAD
General U.S. Population	N/A	N/A	0.000025	<1
All Infants (< 1 year old)			0.000027	<1
Children 1-2 years old			<b>0.000052</b>	<b>&lt;1</b>
Children 3-5 years old			0.000048	<1
Children 6-12 years old			0.000033	<1
Youth 13-19 years old			0.000023	<1
Adults 20-49 years old			0.000022	<1
Adults 50+ years old			0.000020	<1
Females 13-49 years old			<b>0.000066</b>	<b>&lt;1</b>

**Table 9. Summary of Dietary Exposure and Risk for Acifluorfen – Food and Drinking Water (Acifluorfen in Drinking Water From Lactofen Applications)**

Population Subgroup	Acute Dietary (95 <sup>th</sup> Percentile)		Chronic Dietary	
	Dietary Exposure (mg/kg/day)	% aPAD	Dietary Exposure (mg/kg/day)	% cPAD
General U.S. Population	N/A	N/A	0.00017	13
All Infants (< 1 year old)			<b>0.000478</b>	<b>37</b>
Children 1-2 years old			0.000324	25
Children 3-5 years old			0.00031	24
Children 6-12 years old			0.00021	16
Youth 13-19 years old			0.000142	11
Adults 20-49 years old			0.000151	12
Adults 50+ years old			0.000135	10
Females 13-49 years old			<b>0.00119</b>	<b>6.0</b>

**VII. Characterization of Inputs/Outputs**

The acute, chronic, and cancer dietary exposure assessments can be considered highly conservative assessments because they assume all food consumed bears residues at the

tolerance level and all water consumed has lactofen and acifluorfen in it at levels comparable to an agricultural area. Actual exposure to lactofen and acifluorfen is likely to be much lower.

## **VIII. Conclusions**

Acute, chronic, and cancer dietary exposure assessments were conducted for lactofen and acifluorfen, an environmental degradate of lactofen, including existing uses and proposed uses of lactofen on fruiting vegetables and okra. All assessments for food alone, and food plus modeled estimates of drinking water concentrations were below the level of concern. The assessments can be considered highly conservative as they assumed all the subject crops are treated and bear residues at the tolerance level. Actual exposure is likely to be much lower.

## **IX. List of Attachments**

- Acute Food Residue Input File - Lactofen
- Acute Food plus Water Residue Input File - Lactofen
- Acute Food Results File - Lactofen
- Acute Food plus Water Results File - Lactofen
- Acute Food plus Water Residue Input File - Acifluorfen
- Acute Food plus Water Results File - Acifluorfen
- Chronic Food Residue Input File - Lactofen
- Chronic Food plus Water Residue Input File - Lactofen
- Chronic Food Results File - Lactofen
- Chronic Food plus Water Results File - Lactofen
- Chronic Food plus Water Residue Input File – Acifluorfen – General Population
- Chronic Food plus Water Results File – Acifluorfen – General Population

cc: Colinger

Acute Food Residue Input File – Lactofen

Filename: C:\Documents and Settings\colinger\My Documents\LACTOFEN\Chem\DEEMPRIA2006\LactofenAcuteTier1Fruitingveggiefoodonly.R98  
 Chemical: Lactofen  
 RfD(Chronic): .008 mg/kg bw/day NOEL(Chronic): 0 mg/kg bw/day  
 RfD(Acute): .017 mg/kg bw/day NOEL(Acute): 0 mg/kg bw/day  
 Date created/last modified: 12-21-2006/11:00:21/8 Program ver. 2.03  
 Comment: Food Only; Acute endpoint 5 LOAEL; 3x FQPA

EPA Code	Crop Grp	Commodity Name	Def Res (ppm)	Adj.Factors #1	Adj.Factors #2	Comment
06010430	6A	Bean, snap, succulent	0.010000	1.000	1.000	
06010431	6A	Bean, snap, succulent-babyfood	0.010000	1.000	1.000	
95001280	O	Cottonseed, oil	0.010000	1.000	1.000	
95001281	O	Cottonseed, oil-babyfood	0.010000	1.000	1.000	
08001480	8	Eggplant	0.020000	1.000	1.000	
08002340	8	Okra	0.020000	1.000	1.000	
95002630	O	Peanut	0.010000	1.000	1.000	
95002640	O	Peanut, butter	0.010000	1.000	1.000	
95002650	O	Peanut, oil	0.010000	1.000	1.000	
08002700	8	Pepper, bell	0.020000	1.000	1.000	
08002701	8	Pepper, bell-babyfood	0.020000	1.000	1.000	
08002710	8	Pepper, bell, dried	0.020000	1.000	1.000	
08002711	8	Pepper, bell, dried-babyfood	0.020000	1.000	1.000	
08002720	8	Pepper, nonbell	0.020000	1.000	1.000	
08002721	8	Pepper, nonbell-babyfood	0.020000	1.000	1.000	
08002730	8	Pepper, nonbell, dried	0.020000	1.000	1.000	
06003470	6	Soybean, seed	0.010000	1.000	1.000	
06003480	6	Soybean, flour	0.010000	1.000	1.000	
06003481	6	Soybean, flour-babyfood	0.010000	1.000	1.000	
06003490	6	Soybean, soy milk	0.010000	1.000	1.000	
06003491	6	Soybean, soy milk-babyfood or in	0.010000	1.000	1.000	
06003500	6	Soybean, oil	0.010000	1.000	1.000	
06003501	6	Soybean, oil-babyfood	0.010000	1.000	1.000	
08003740	8	Tomatillo	0.020000	1.000	1.000	
08003750	8	Tomato	0.020000	1.000	1.000	
08003751	8	Tomato-babyfood	0.020000	1.000	1.000	
08003760	8	Tomato, paste	0.020000	1.000	1.000	
08003761	8	Tomato, paste-babyfood	0.020000	1.000	1.000	
08003770	8	Tomato, puree	0.020000	1.000	1.000	
08003771	8	Tomato, puree-babyfood	0.020000	1.000	1.000	
08003780	8	Tomato, dried	0.020000	1.000	1.000	
08003781	8	Tomato, dried-babyfood	0.020000	1.000	1.000	
08003790	8	Tomato, juice	0.020000	1.000	1.000	

Acute Food plus Water Residue Input File – Lactofen

Filename: C:\Documents and Settings\colinger\My Documents\LACTOFEN\Chem\DEEMPRIA2006\LactofenTier1AcuteFruitingveggiefoodandwaterLOAEL 5.R98

Chemical: Lactofen

RfD(Chronic): .008 mg/kg bw/day NOEL(Chronic): 0 mg/kg bw/day

RfD(Acute): .017 mg/kg bw/day NOEL(Acute): 0 mg/kg bw/day

Date created/last modified: 11-09-2006/13:28:43/8

Program ver. 2.03

Comment: Food and water; surface at 1.48; acute at 0.017 - 5 LOAEL, 3X FQPA

EPA Code	Crop Grp	Commodity Name	Def Res (ppm)	Adj.Factors #1	Adj.Factors #2	Comment
06010430	6A	Bean, snap, succulent	0.010000	1.000	1.000	
06010431	6A	Bean, snap, succulent-babyfood	0.010000	1.000	1.000	
95001280	0	Cottonseed, oil	0.010000	1.000	1.000	
95001281	0	Cottonseed, oil-babyfood	0.010000	1.000	1.000	
08001480	8	Eggplant	0.020000	1.000	1.000	
08002340	8	Okra	0.020000	1.000	1.000	
95002630	0	Peanut	0.010000	1.000	1.000	
95002640	0	Peanut, butter	0.010000	1.000	1.000	
95002650	0	Peanut, oil	0.010000	1.000	1.000	
08002700	8	Pepper, bell	0.020000	1.000	1.000	
08002701	8	Pepper, bell-babyfood	0.020000	1.000	1.000	
08002710	8	Pepper, bell, dried	0.020000	1.000	1.000	
08002711	8	Pepper, bell, dried-babyfood	0.020000	1.000	1.000	
08002720	8	Pepper, nonbell	0.020000	1.000	1.000	
08002721	8	Pepper, nonbell-babyfood	0.020000	1.000	1.000	
08002730	8	Pepper, nonbell, dried	0.020000	1.000	1.000	
06003470	6	Soybean, seed	0.010000	1.000	1.000	
06003480	6	Soybean, flour	0.010000	1.000	1.000	
06003481	6	Soybean, flour-babyfood	0.010000	1.000	1.000	
06003490	6	Soybean, soy milk	0.010000	1.000	1.000	
06003491	6	Soybean, soy milk-babyfood or in	0.010000	1.000	1.000	
06003500	6	Soybean, oil	0.010000	1.000	1.000	
06003501	6	Soybean, oil-babyfood	0.010000	1.000	1.000	
08003740	8	Tomatillo	0.020000	1.000	1.000	
08003750	8	Tomato	0.020000	1.000	1.000	
08003751	8	Tomato-babyfood	0.020000	1.000	1.000	
08003760	8	Tomato, paste	0.020000	1.000	1.000	
08003761	8	Tomato, paste-babyfood	0.020000	1.000	1.000	
08003770	8	Tomato, puree	0.020000	1.000	1.000	
08003771	8	Tomato, puree-babyfood	0.020000	1.000	1.000	
08003780	8	Tomato, dried	0.020000	1.000	1.000	
08003781	8	Tomato, dried-babyfood	0.020000	1.000	1.000	
08003790	8	Tomato, juice	0.020000	1.000	1.000	
86010000	0	Water, direct, all sources	0.001480	1.000	1.000	
86020000	0	Water, indirect, all sources	0.001480	1.000	1.000	

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Acute Food Results File – Lactofen

U.S. Environmental Protection Agency Ver. 2.02  
DEEM-FCID ACUTE Analysis for LACTOFEN (1994-98 data)  
Residue file: LactofenAcuteTier1Fruitingveggiefoodonly.R98  
Adjustment factor #2 NOT used.  
Analysis Date: 12-21-2006/11:08:19      Residue file dated: 12-21-2006/11:05:29/8  
Daily totals for food and foodform consumption used.  
Run Comment: "Food Only; Acute endpoint 5 LOAEL; 3x FQPA"  
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Summary calculations (per capita):

	95th Percentile		99th Percentile		99.9th Percentile	
	Exposure	% aRfD	Exposure	% aRfD	Exposure	% aRfD
	-----	-----	-----	-----	-----	-----
Females 13-49 yrs:	0.000066	0.39	0.000109	0.64	0.000231	1.36

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Acute Food plus Water Results File – Lactofen

U.S. Environmental Protection Agency Ver. 2.02  
DEEM-FCID ACUTE Analysis for LACTOFEN (1994-98 data)  
Residue file: LactofenTier1AcuteFruitingveggiefoodandwaterLOAEL5.R98  
Adjustment factor #2 NOT used.  
Analysis Date: 12-21-2006/11:09:37      Residue file dated: 12-21-2006/11:04:52/8  
Daily totals for food and foodform consumption used.  
Run Comment: "Food and water; surface at 1.48; acute at 0.017 - 5 LOAEL, 3X F  
QPA"

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Summary calculations (per capita):

	95th Percentile		99th Percentile		99.9th Percentile	
	Exposure	% aRfD	Exposure	% aRfD	Exposure	% aRfD
	-----	-----	-----	-----	-----	-----
Females 13-49 yrs:	0.000112	0.66	0.000168	0.99	0.000330	1.94

**Acute Food plus Water Residue Input File – Acifluorfen**

Filename: C:\Documents and Settings\colinger\My Documents\LACTOFEN\Chem\DEEMPRIA2006\AcifluorfenTier1AcuteFoodandWater.R98  
 Chemical: Acifluorfen  
 RfD(Chronic): .004 mg/kg bw/day NOEL(Chronic): 1.25 mg/kg bw/day  
 RfD(Acute): .02 mg/kg bw/day NOEL(Acute): 0 mg/kg bw/day  
 Date created/last modified: 10-23-2006/10:22:37/8 Program ver. 2.03  
 Comment: Acifluorfen Tolerance and Water from Lactofen Applications - Water at 22.5 ppb

EPA Code	Crop Grp	Commodity Name	Def Res (ppm)	Adj.Factors #1	Adj.Factors #2	Comment
95002630	0	Peanut	0.100000	1.000	1.000	
95002640	0	Peanut, butter	0.100000	1.000	1.000	
95002650	0	Peanut, oil	0.100000	1.000	1.000	
15003230	15	Rice, white	0.100000	1.000	1.000	
15003231	15	Rice, white-babyfood	0.100000	1.000	1.000	
15003240	15	Rice, brown	0.100000	1.000	1.000	
15003241	15	Rice, brown-babyfood	0.100000	1.000	1.000	
15003250	15	Rice, flour	0.100000	1.000	1.000	
15003251	15	Rice, flour-babyfood	0.100000	1.000	1.000	
15003260	15	Rice, bran	0.100000	1.000	1.000	
15003261	15	Rice, bran-babyfood	0.100000	1.000	1.000	
06003470	6	Soybean, seed	0.100000	1.000	1.000	
06003480	6	Soybean, flour	0.100000	1.000	1.000	
06003481	6	Soybean, flour-babyfood	0.100000	1.000	1.000	
06003490	6	Soybean, soy milk	0.100000	1.000	1.000	
06003491	6	Soybean, soy milk-babyfood or in	0.100000	1.000	1.000	
06003500	6	Soybean, oil	0.100000	1.000	1.000	
06003501	6	Soybean, oil-babyfood	0.100000	1.000	1.000	
95003590	0	Strawberry	0.050000	1.000	1.000	
95003591	0	Strawberry-babyfood	0.050000	1.000	1.000	
95003600	0	Strawberry, juice	0.050000	1.000	1.000	
95003601	0	Strawberry, juice-babyfood	0.050000	1.000	1.000	
86010000	0	Water, direct, all sources	0.022500	1.000	1.000	
86020000	0	Water, indirect, all sources	0.022500	1.000	1.000	

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### Acute Food plus Water Results File – Acifluorfen

U.S. Environmental Protection Agency Ver. 2.02  
DEEM-FCID ACUTE Analysis for ACIFLUORFEN (1994-98 data)  
Residue file: AcifluorfenTier1AcuteFoodandWater.R98  
Adjustment factor #2 NOT used.  
Analysis Date: 10-23-2006/10:25:02      Residue file dated: 10-23-2006/10:22:37/8  
Daily totals for food and foodform consumption used.  
Run Comment: "Acifluorfen Tolerance and Water from Lactofen Applications - Water at 22.5 ppb"

=====  
Summary calculations (per capita):

	95th Percentile		99th Percentile		99.9th Percentile	
	Exposure	% aRfD	Exposure	% aRfD	Exposure	% aRfD
	-----	-----	-----	-----	-----	-----
Females 13-49 yrs:	0.001190	5.95	0.001925	9.62	0.003200	16.00

Chronic Food Residue Input File – Lactofen

Filename: C:\Documents and Settings\colinger\My Documents\LACTOFEN\Chem\DEEMPRIA2006\LactofenTier1Fruitingveggie.R98  
 Chemical: Lactofen  
 RfD(Chronic): .008 mg/kg bw/day NOEL(Chronic): .3 mg/kg bw/day  
 RfD(Acute): .04 mg/kg bw/day NOEL(Acute): 0 mg/kg bw/day  
 Date created/last modified: 10-26-2006/14:26:02/8 Program ver. 2.03  
 Comment: Food Only

EPA Code	Crop Grp	Commodity Name	Def Res (ppm)	Adj.Factors #1	Adj.Factors #2	Comment
06010430	6A	Bean, snap, succulent	0.010000	1.000	1.000	
06010431	6A	Bean, snap, succulent-babyfood	0.010000	1.000	1.000	
95001280	O	Cottonseed, oil	0.010000	1.000	1.000	
95001281	O	Cottonseed, oil-babyfood	0.010000	1.000	1.000	
08001480	8	Eggplant	0.020000	1.000	1.000	
08002340	8	Okra	0.020000	1.000	1.000	
95002630	O	Peanut	0.010000	1.000	1.000	
95002640	O	Peanut, butter	0.010000	1.000	1.000	
08002700	8	Pepper, bell	0.020000	1.000	1.000	
08002701	8	Pepper, bell-babyfood	0.020000	1.000	1.000	
08002710	8	Pepper, bell, dried	0.020000	1.000	1.000	
08002711	8	Pepper, bell, dried-babyfood	0.020000	1.000	1.000	
08002720	8	Pepper, nonbell	0.020000	1.000	1.000	
08002721	8	Pepper, nonbell-babyfood	0.020000	1.000	1.000	
08002730	8	Pepper, nonbell, dried	0.020000	1.000	1.000	
06003470	6	Soybean, seed	0.010000	1.000	1.000	
06003480	6	Soybean, flour	0.010000	1.000	1.000	
06003481	6	Soybean, flour-babyfood	0.010000	1.000	1.000	
06003490	6	Soybean, soy milk	0.010000	1.000	1.000	
06003491	6	Soybean, soy milk-babyfood or in	0.010000	1.000	1.000	
06003500	6	Soybean, oil	0.010000	1.000	1.000	
06003501	6	Soybean, oil-babyfood	0.010000	1.000	1.000	
08003740	8	Tomatillo	0.020000	1.000	1.000	
08003750	8	Tomato	0.020000	1.000	1.000	
08003751	8	Tomato-babyfood	0.020000	1.000	1.000	
08003760	8	Tomato, paste	0.020000	1.000	1.000	
08003761	8	Tomato, paste-babyfood	0.020000	1.000	1.000	
08003770	8	Tomato, puree	0.020000	1.000	1.000	
08003771	8	Tomato, puree-babyfood	0.020000	1.000	1.000	
08003780	8	Tomato, dried	0.020000	1.000	1.000	
08003781	8	Tomato, dried-babyfood	0.020000	1.000	1.000	
08003790	8	Tomato, juice	0.020000	1.000	1.000	

Chronic Food plus Water Residue Input File – Lactofen

Filename: C:\Documents and Settings\colinger\My Documents\LACTOFEN\Chem\DEEMPRIA2006\LactofenTier1ChronicFruitingveggiefoodandwater.R98

Chemical: Lactofen

RfD(Chronic): .008 mg/kg bw/day NOEL(Chronic): .3 mg/kg bw/day

RfD(Acute): .17 mg/kg bw/day NOEL(Acute): 0 mg/kg bw/day

Date created/last modified: 10-17-2006/10:09:53/8

Program ver. 2.03

Comment: Food and water; acute with 10x; surface at 1.48

EPA Code	Crop Grp	Commodity Name	Def Res (ppm)	Adj.Factors #1	Adj.Factors #2	Comment
06010430	6A	Bean, snap, succulent	0.010000	1.000	1.000	
06010431	6A	Bean, snap, succulent-babyfood	0.010000	1.000	1.000	
95001280	O	Cottonseed, oil	0.010000	1.000	1.000	
95001281	O	Cottonseed, oil-babyfood	0.010000	1.000	1.000	
08001480	8	Eggplant	0.020000	1.000	1.000	
08002340	8	Okra	0.020000	1.000	1.000	
95002630	O	Peanut	0.010000	1.000	1.000	
95002640	O	Peanut, butter	0.010000	1.000	1.000	
08002700	8	Pepper, bell	0.020000	1.000	1.000	
08002701	8	Pepper, bell-babyfood	0.020000	1.000	1.000	
08002710	8	Pepper, bell, dried	0.020000	1.000	1.000	
08002711	8	Pepper, bell, dried-babyfood	0.020000	1.000	1.000	
08002720	8	Pepper, nonbell	0.020000	1.000	1.000	
08002721	8	Pepper, nonbell-babyfood	0.020000	1.000	1.000	
08002730	8	Pepper, nonbell, dried	0.020000	1.000	1.000	
06003470	6	Soybean, seed	0.010000	1.000	1.000	
06003480	6	Soybean, flour	0.010000	1.000	1.000	
06003481	6	Soybean, flour-babyfood	0.010000	1.000	1.000	
06003490	6	Soybean, soy milk	0.010000	1.000	1.000	
06003491	6	Soybean, soy milk-babyfood or in	0.010000	1.000	1.000	
06003500	6	Soybean, oil	0.010000	1.000	1.000	
06003501	6	Soybean, oil-babyfood	0.010000	1.000	1.000	
08003740	8	Tomatillo	0.020000	1.000	1.000	
08003750	8	Tomato	0.020000	1.000	1.000	
08003751	8	Tomato-babyfood	0.020000	1.000	1.000	
08003760	8	Tomato, paste	0.020000	1.000	1.000	
08003761	8	Tomato, paste-babyfood	0.020000	1.000	1.000	
08003770	8	Tomato, puree	0.020000	1.000	1.000	
08003771	8	Tomato, puree-babyfood	0.020000	1.000	1.000	
08003780	8	Tomato, dried	0.020000	1.000	1.000	
08003781	8	Tomato, dried-babyfood	0.020000	1.000	1.000	
08003790	8	Tomato, juice	0.020000	1.000	1.000	
86010000	O	Water, direct, all sources	0.000044	1.000	1.000	
86020000	O	Water, indirect, all sources	0.000044	1.000	1.000	

**Chronic Food Results File – Lactofen**

U.S. Environmental Protection Agency Ver. 2.00  
 DEEM-FCID Chronic analysis for LACTOFEN (1994-98 data)  
 Residue file name: C:\Documents and Settings\colinger\My  
 Documents\LACTOFEN\Chem\DEEMPRIA2006\LactofenTier1Fruitingveggie.R98  
Adjustment factor #2 NOT used.  
 Analysis Date 10-26-2006/14:28:39 Residue file dated: 10-26-2006/14:26:02/8  
 Reference dose (RfD, Chronic) = .008 mg/kg bw/day  
 COMMENT 1: Food Only

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Total exposure by population subgroup

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Population Subgroup	Total Exposure	
	mg/kg body wt/day	Percent of Rfd
-----		
U.S. Population (total)	0.000024	0.3%
U.S. Population (spring season)	0.000023	0.3%
U.S. Population (summer season)	0.000025	0.3%
U.S. Population (autumn season)	0.000024	0.3%
U.S. Population (winter season)	0.000024	0.3%
Northeast region	0.000024	0.3%
Midwest region	0.000024	0.3%
Southern region	0.000023	0.3%
Western region	0.000026	0.3%
Hispanics	0.000029	0.4%
Non-hispanic whites	0.000024	0.3%
Non-hispanic blacks	0.000022	0.3%
Non-hisp/non-white/non-black	0.000028	0.3%
All infants (< 1 year)	0.000024	0.3%
Nursing infants	0.000010	0.1%
Non-nursing infants	0.000029	0.4%
Children 1-6 yrs	0.000047	0.6%
Children 7-12 yrs	0.000031	0.4%
Females 13-19 (not preg or nursing)	0.000021	0.3%
Females 20+ (not preg or nursing)	0.000020	0.2%
Females 13-50 yrs	0.000022	0.3%
Females 13+ (preg/not nursing)	0.000022	0.3%
Females 13+ (nursing)	0.000022	0.3%
Males 13-19 yrs	0.000024	0.3%
Males 20+ yrs	0.000022	0.3%
Seniors 55+	0.000019	0.2%
Children 1-2 yrs	0.000051	0.6%
Children 3-5 yrs	0.000047	0.6%
Children 6-12 yrs	0.000032	0.4%
Youth 13-19 yrs	0.000022	0.3%
Adults 20-49 yrs	0.000021	0.3%
Adults 50+ yrs	0.000019	0.2%
Females 13-49 yrs	0.000020	0.3%

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**Chronic Food plus Water Results File – Lactofen**

U.S. Environmental Protection Agency Ver. 2.00  
 DEEM-FCID Chronic analysis for LACTOFEN (1994-98 data)  
 Residue file name: C:\Documents and Settings\colinger\My  
 Documents\LACTOFEN\Chem\DEEMPRIA2006\LactofenTier1ChronicFruitingveggiefoodandwater.R9  
 8 Adjustment factor #2 NOT used.  
 Analysis Date 10-17-2006/10:12:28 Residue file dated: 10-17-2006/10:09:53/8  
 Reference dose (RfD, Chronic) = .008 mg/kg bw/day  
 COMMENT 1: Food and water; acute with 10x; Water at 0.044 ppb

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 Total exposure by population subgroup  
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Population Subgroup	Total Exposure	
	mg/kg body wt/day	Percent of Rfd
U.S. Population (total)	0.000025	0.3%
U.S. Population (spring season)	0.000024	0.3%
U.S. Population (summer season)	0.000026	0.3%
U.S. Population (autumn season)	0.000025	0.3%
U.S. Population (winter season)	0.000025	0.3%
Northeast region	0.000025	0.3%
Midwest region	0.000025	0.3%
Southern region	0.000024	0.3%
Western region	0.000027	0.3%
Hispanics	0.000030	0.4%
Non-hispanic whites	0.000025	0.3%
Non-hispanic blacks	0.000023	0.3%
Non-hisp/non-white/non-black	0.000029	0.4%
All infants (< 1 year)	0.000027	0.3%
Nursing infants	0.000012	0.1%
Non-nursing infants	0.000033	0.4%
Children 1-6 yrs	0.000048	0.6%
Children 7-12 yrs	0.000032	0.4%
Females 13-19 (not preg or nursing)	0.000021	0.3%
Females 20+ (not preg or nursing)	0.000020	0.3%
Females 13-50 yrs	0.000023	0.3%
Females 13+ (preg/not nursing)	0.000023	0.3%
Females 13+ (nursing)	0.000023	0.3%
Males 13-19 yrs	0.000025	0.3%
Males 20+ yrs	0.000023	0.3%
Seniors 55+	0.000020	0.3%
Children 1-2 yrs	0.000052	0.7%
Children 3-5 yrs	0.000048	0.6%
Children 6-12 yrs	0.000033	0.4%
Youth 13-19 yrs	0.000023	0.3%
Adults 20-49 yrs	0.000022	0.3%
Adults 50+ yrs	0.000020	0.3%
Females 13-49 yrs	0.000021	0.3%

**Chronic Food plus Water Residue Input File – Acifluorfen – General Population**

Filename: C:\Documents and Settings\colinger\My

Documents\LACTOFEN\Chem\DEEMPRIA2006\AcifluorfenTier1ChronicFoodandWatergenpop.R98

Chemical: Acifluorfen

RfD(Chronic): .0013 mg/kg bw/day NOEL(Chronic): 0 mg/kg bw/day

RfD(Acute): .02 mg/kg bw/day NOEL(Acute): 0 mg/kg bw/day

Date created/last modified: 11-07-2006/09:22:39/8

Program ver. 2.03

Comment: Acifluorfen Tolerance and Water from Lactofen Applications - Water at 3.9 ppb

EPA Code	Crop Grp	Commodity Name	Def Res (ppm)	Adj.Factors #1	Adj.Factors #2	Comment
95002630	O	Peanut	0.100000	1.000	1.000	
95002640	O	Peanut, butter	0.100000	1.000	1.000	
95002650	O	Peanut, oil	0.100000	1.000	1.000	
15003230	15	Rice, white	0.100000	1.000	1.000	
15003231	15	Rice, white-babyfood	0.100000	1.000	1.000	
15003240	15	Rice, brown	0.100000	1.000	1.000	
15003241	15	Rice, brown-babyfood	0.100000	1.000	1.000	
15003250	15	Rice, flour	0.100000	1.000	1.000	
15003251	15	Rice, flour-babyfood	0.100000	1.000	1.000	
15003260	15	Rice, bran	0.100000	1.000	1.000	
15003261	15	Rice, bran-babyfood	0.100000	1.000	1.000	
06003470	6	Soybean, seed	0.100000	1.000	1.000	
06003480	6	Soybean, flour	0.100000	1.000	1.000	
06003481	6	Soybean, flour-babyfood	0.100000	1.000	1.000	
06003490	6	Soybean, soy milk	0.100000	1.000	1.000	
06003491	6	Soybean, soy milk-babyfood or in	0.100000	1.000	1.000	
06003500	6	Soybean, oil	0.100000	1.000	1.000	
06003501	6	Soybean, oil-babyfood	0.100000	1.000	1.000	
95003590	O	Strawberry	0.050000	1.000	1.000	
95003591	O	Strawberry-babyfood	0.050000	1.000	1.000	
95003600	O	Strawberry, juice	0.050000	1.000	1.000	
95003601	O	Strawberry, juice-babyfood	0.050000	1.000	1.000	
86010000	O	Water, direct, all sources	0.003900	1.000	1.000	
86020000	O	Water, indirect, all sources	0.003900	1.000	1.000	

**Chronic Food plus Water Results File – Acifluorfen – General Population**

U.S. Environmental Protection Agency Ver. 2.00  
 DEEM-FCID Chronic analysis for ACIFLUORFEN (1994-98 data)  
 Residue file name: C:\Documents and Settings\colinger\My  
 Documents\LACTOFEN\Chem\DEEMPRIA2006\AcifluorfenTier1ChronicFoodandWatergenpop.R98  
 Adjustment factor #2 NOT used.  
 Analysis Date 11-07-2006/09:23:29 Residue file dated: 11-07-2006/09:22:39/8  
 Reference dose (RfD, Chronic) = .0013 mg/kg bw/day  
 COMMENT 1: Acifluorfen Tolerance and Water from Lactofen Applications - Water at 3.9  
 ppb

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                        Total exposure by population subgroup
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                                Total Exposure
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Population Subgroup	mg/kg body wt/day	Percent of Rfd
U.S. Population (total)	0.000170	13.1%
U.S. Population (spring season)	0.000172	13.2%
U.S. Population (summer season)	0.000177	13.6%
U.S. Population (autumn season)	0.000165	12.7%
U.S. Population (winter season)	0.000167	12.8%
Northeast region	0.000165	12.7%
Midwest region	0.000166	12.7%
Southern region	0.000159	12.2%
Western region	0.000197	15.2%
Hispanics	0.000200	15.4%
Non-hispanic whites	0.000158	12.1%
Non-hispanic blacks	0.000168	12.9%
Non-hisp/non-white/non-black	0.000305	23.5%
All infants (< 1 year)	0.000478	36.8%
Nursing infants	0.000192	14.7%
Non-nursing infants	0.000587	45.1%
Children 1-6 yrs	0.000308	23.7%
Children 7-12 yrs	0.000201	15.4%
Females 13-19 (not preg or nursing)	0.000128	9.8%
Females 20+ (not preg or nursing)	0.000141	10.8%
Females 13-50 yrs	0.000151	11.6%
Females 13+ (preg/not nursing)	0.000172	13.3%
Females 13+ (nursing)	0.000205	15.8%
Males 13-19 yrs	0.000156	12.0%
Males 20+ yrs	0.000150	11.5%
Seniors 55+	0.000133	10.2%
Children 1-2 yrs	0.000324	24.9%
Children 3-5 yrs	0.000310	23.9%
Children 6-12 yrs	0.000211	16.2%
Youth 13-19 yrs	0.000142	10.9%
Adults 20-49 yrs	0.000151	11.6%
Adults 50+ yrs	0.000135	10.4%
Females 13-49 yrs	0.000143	11.0%

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