OPP 20040043

Dietary Exposure Resulting from Reldan® Use on Small Grain

Cumulative Dietary Exposure Assessment of Organophosphate Pesticides Including Reldan®

USDA Office of Pest Management Policy
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Introduction

The Environmental Protection Agency (EPA) recently conducted an aggregate and cumulative exposure assessment of organophosphate (OP) pesticides used in public health, agriculture and residential settings[1]. The dietary component of EPA's exposure assessment did not include the use of Reldan® – chlorpyrifos methyl – on stored, small grains such as wheat, oats, or rice. Reldan® is an important pesticide for stored grains and currently has no comparable substitute. The continued use of Reldan®, or an efficacious substitute, is critical in preventing pests from destroying grain reserves, a need that has become even more critical when considering homeland security. The United States Department of Agriculture (USDA) Office of Pest Management Policy reassessed the cumulative dietary exposure for organophosphates including Reldan® to determine whether Reldan® treated grains are significant dietary risk drivers.

Reldan® use at the current application rate or one-half the current application rate does not add significantly to the estimated exposure of the most sensitive sub-group - one and two year-olds - at the 99.9th percentile of exposure. Stored grains treated with Reldan® are not significant risk drivers – stored grains did not appear in the list of commodities significantly contributing to dietary exposure in any of the DEEM-FCID® model runs.

Methods

The EPA's June 2, 2002 aggregate and cumulative exposure assessment of the organophosphates was used as the baseline for comparisons between dietary exposure without Reldan® and dietary exposure at one-half the application rate and the full current application rate. DEEM-FCID® version 1.15 was used to perform the cumulative dietary exposure assessment.

When the EPA released the aggregate and cumulative OP risk assessment they provided the DEEM-FCID® file (OPCRA.R98), along with all of the necessary pesticide residue distribution files (*.rdf) to reproduce their results. USDA used these files to run the "baseline" risk assessment without Reldan®. The EPA also provided the Access database used to generate the pesticide residue distribution files used in the aggregate and cumulative OP risk assessment. USDA used this database to generate new pesticide residue distribution files that included Reldan® at half and full application rates.

Residue Distributions

The pesticide residues used in the EPA's aggregate and cumulative risk assessment are the summation of the residues of all the different pesticides, expressed in units of the index chemical (methamidophos,) detected on a particular commodity. The potency of the various OP pesticide varies making it necessary to express all of the residues on a

similar potency scale before adding them together to produce the "total" pesticide residue for a particular sample of a commodity. The "total" pesticide residue on each Pesticide Data Program (PDP) sample is calculated using the following equation:

$$R = \sum_{i=1}^{n} P_i \times RPF_i \times PF_i$$

where R is the total residue expressed in units of the index chemical; n is the total number of pesticides in the OP cumulative assessment; P is the residue of the i^{th} pesticide detected; RPF is the relative potency factor of the i^{th} for pesticide; and PF is the processing factor for the i^{th} pesticide on a particular commodity and food form.

Simulation of the half and full application rate of Reldan® required recalculation of the residue distribution files for oats, wheat, and rice to include chlropyrifos methyl in the calculation of a "total" OP pesticide residue for each sample. Chlorpyrifos methyl was detected on USDA Pesticide Data Program (PDP) samples of oats, wheat and rice from 1994 to 2000. Although residues were detected on PDP samples, chlorpyrifos methyl on stored grains was not included in the EPA's aggregate and cumulative exposure assessment[1]. The residue distribution files used in DEEM-FCID® for stored grains were recalculated, adding these chorpyrifos methyl (Reldan®) residues into the total cumulative organophosphate residue.

The Relative Potency Factor for Chlorpyrifos Methyl

Recalculating the residue distribution files required adjusting the chlorpyrifos methyl residues detected on PDP samples by the appropriate relative potency factor (RPF.) The RPF "converts" the residue of each organophosphate pesticide into equivalent units of the index chemical – methamidiphos. This process is somewhat analogous to using the current exchange rate to convert the currency of one country into that of another country. The June 2 version of the EPA's revised OP cumulative risk assessment used a RPF of 0 for chlorpyrifos methyl, essentially removing it from consideration in the risk assessment. Previously, the EPA used a RPF of 0.012 for chlorpyrifos methyl in their December 2001 exposure assessment[2]. Although not used for stored grains, the EPA reported a new RPF of 0.005 and a Food Quality Protection Act (FQPA) factor of 3 for chlorpyrifos methyl in the Revised OP Cumulative Risk Assessment (Table I.B-8.) This RPF and FQPA factor were used in this dietary exposure assessment resulting in a FQPA-adjusted RPF of 0.015 (0.005*3).

Adjusting the Application Rate

Two different application rates of Reldan® were considered: 1) full application rate and 2) half application rate. The current, full application rate is assumed reflected in the detectable chlorpyrifos methyl residues from the PDP samples. These residues are used in the EPA's OPCRA database to build residue distribution files for use in DEEM-

FCID®. For simulation of the full application rate, the detectable chlorpyrifos methyl residues were adjusted by the FQPA adjusted RPF value of 0.015 when calculating the total residue load, expressed in units of the index chemical, in each PDP sample for oats, wheat or rice.

The half application rate was simulated by adjusted the detectable chlorpyrifos methyl residues in the PDP samples by half of the FQPA adjusted RPF value (0.0075). It is assumed that approximately half the detectable residue would result from applying half the application rate. Adjusting the RPF rather than manually adjusting each chlorpyrifos methyl detectable residue was easier to implement, less prone to error and resulted in the same total residue, expressed as units of the index chemical.

Processing Factors for Commodities Included in the Analysis

PDP samples of wheat, oats and rice are already used in the EPA's revised OP cumulative risk assessment[1]. The EPA provided a bridging table to convert these PDP samples into other commodities and also provided chemical-specific processing factors to convert the detectable residues into different food forms. Processing factors for chlorpyrifos methyl on these commodities were used in the EPA's preliminary OP cumulative risk assessment[2]. These same processing factors were used to generate chlorpyrifos methyl residues for various food forms of wheat, oats, and rice in this dietary assessment (Table 1). Residue distribution files were generated using the EPA's OPCRA Access database[3] for each commodity and food form associated with small grains (Appendix D.) Two sets of residue distribution files were generated for each commodity/food form: 1) residue distribution files at full application rate using FQPA adjusted RPF of 0.015; and 2) residue distribution files at half application rate using FQPA adjusted RPF of 0.0075.

Table 1. Chlorpyrifos methyl Processing Factors for Small Grain Food Forms

Commodity	Food Form	Processing Factor
Rice-bran	Fried	1
Rice-bran	Baked	1
Rice-bran	Cooked: NFS	1
Rice-bran	Uncooked	1
Rice-bran	Canned: NFS	1
Rice-milled (white)	Canned: Cooked	1
Rice-milled (white)	Cooked: NFS	1
Rice-milled (white)	Baked	1
Rice-milled (white)	Boiled	1
Rice-milled (white)	Canned: NFS	1
Rice-milled (white)	Canned: Boiled	1
Rice-milled (white)	Frozen: Cooked	1
Rice-milled (white)	Alcohol/Fermented/Distilled	1
Rice-milled (white)	Fried	1
Rice-rough (brown)	Cooked: NFS	1
Rice-rough (brown)	Alcohol/Fermented/Distilled	1
Rice-rough (brown)	Canned: NFS	1
Rice-rough (brown)	Boiled	1

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Rice-rough (brown)	Baked	1
Oats	Uncooked	1
Oats	Cooked: NFS	0.36
Oats	Baked	0.36
Oats	Boiled	0.026
Oats	Fried	0.36
Oats	Canned: NFS	0.026
Oats-bran	Uncooked	1
Oats-bran	Cooked: NFS	0.36
Oats-bran	Baked	0.36
Oats-bran	Boiled	0.026
Oats-bran	Fried	0.36
Wheat-rough	Uncooked	0.84
Wheat-rough	Cooked: NFS	0.36
Wheat-rough	Baked	0.36
Wheat-rough	Boiled	0.026
Wheat-rough	Canned: NFS	0.84
Wheat-germ	Cooked: NFS	0.36
Wheat-germ	Baked	0.36
Wheat-germ	Boiled	0.026
Wheat-bran	Uncooked	1
Wheat-bran	Cooked: NFS	0.36
Wheat-bran	Baked	0.36
Wheat-flour	Uncooked	1
Wheat-flour	Cooked: NFS	0.36
Wheat-flour	Baked	0.36
Wheat-flour	Boiled	0.026
Wheat-flour	Fried	0.36
Wheat-flour	Canned: NFS	0.026
Wheat-flour	Canned: Cooked	0.026
Wheat-flour	Canned: Baked	0.026
Wheat-flour	Canned: Boiled	0.026
Wheat-flour	Frozen: NFS	0.36
Wheat-flour	Frozen: Cooked	0.36
Wheat-flour	Frozen: Baked	0.36
Wheat-flour	Frozen: Fried	0.36
Wheat-flour	Cured: Cooked (smoked/picked/saltd)	0.36
Wheat-germ oil	Baked	2.7

Residues used in the analysis

Stored grains are considered blended commodities in the EPA's standard operating procedures for conducting dietary exposure assessments. The average residue detected on a particular food form of a commodity was used as a point estimator of the residue in the DEEM-FCID® model. No Monte Carlo analysis of residues on stored grains was conducted, although residues on other commodities in the aggregate and cumulative analysis were estimated using Monte Carlo techniques. The average residues for most of the stored grains increased when either a half application or full application of Reldan®was included in the calculation of the total residues expressed in units of the

index chemical (Tables 1-3 in Appendix 1). Some averages were unchanged because chlorpyrifos methyl was not detected on those commodities.

Model Parameters

Three model scenarios were analyzed: baseline without Reldan®; half application of Reldan®; and full application of Reldan®. For all of these scenarios, the maximum number of iterations was 1000. Two different random number seeds (10 and 1957) and two different sets of sub-populations (two sub-populations and four sub-populations) were simulated. When two sensitive sub-populations were modeled the sub-populations were: 1) one and two year-old children; and 2) three to five year-old children. When four sub-populations were modeled, the four sub-populations were: 1) one and two year-old children; 2) three to five year-old children; 3) twenty to forty-nine year old adults; and 4) fifty to ninety-nine year old adults. All subpopulations included both males and females, and all regions and seasons included in the Continuing Survey of Food Intakes by Individuals. The maximum number of iterations of 1000, the random number seed of 10 and the use of four sub-populations are consistent with the EPA's June 2 aggregate and cumulative exposure assessment[1].

Results

Cumulative dietary exposure assessments were conducted for three separate scenarios: 1) the "baseline" EPA Revised OP cumulative risk assessment; 2) cumulative OP dietary exposure assessment including Reldan® at full application rate; and 3) cumulative OP dietary exposure assessment including Reldan® at half-application rate.

Model scenarios using the same random number seed and the same number of sub-populations use the exact same sequence of pseudorandom numbers in the Monte Carlo analysis to generate individual exposures. Comparing model runs using the same random number seed and same number of sub-populations should illustrate the difference in exposure due to the additional Reldan residues. Differences in exposure between these runs are slight. The margin of exposure (MOE) does not change with the addition of Reldan. Exposures for either the half or full application of Reldan generally are only 0.000001 mg/kg body weight greater than the baseline exposure for the most sensitive sub-population – one and two year-olds at the 99.9th percentile of the exposure distribution (Table 2).

Table 2. DEEM-FCID® estimates of exposure at the 99.9th percentile of the exposure distribution

			1 & 2 Yr. olds		3 & 5 Yr. olds	
Model Type	Random Seed	Number of Sub-Populations Modeled	Exposure (mg/kg)	MOE	Exposure (mg/kg)	MOE
Baseline	10	2	0.001729	46	0.001485	53

Half rate Reldan	10	2	0.001729	46	0.001486	53
Full rate Reldan	10	2	0.001731	46	0.001487	53
Baseline	1957	2	0.001782	44	0.001490	53
Half rate Reldan	1957	2	0.001782	44	0.001490	53
Full rate Reldan	1957	2	0.001782	44	0.001491	53
Baseline	10	4	0.001761	45	0.001492	53
Half rate Reldan	10	4	0.001760	45	0.001492	53
Full rate Reldan	10	4	0.001761	45	0.001493	53
Baseline	1957	4	0.001754	45	0.001477	54
Half rate Reldan	1957	4	0.001755	45	0.001478	54
Full rate Reldan	1957	4	0.001755	45	0.001478	54

The exposure difference between model scenarios including different Reldan® application rates (0, half or full) is smaller than the exposure difference between the same model scenario using different random number seeds or different numbers of subpopulations. The additional exposure due to Reldan is smaller than the variability inherent in the baseline model.

References

1. Environmental Protection Agency. Office of Pesticide Programs. Revised OP Cumulative Risk Assessment. June 2, 2002. Available at: http://www.epa.gov/pesticides/cumulative/rra-op/

2. Environmental Protection Agency. Office of Pesticide Programs. Preliminary Organophosphate Cumulative Risk Assessment. December 2001. Available at: http://www.epa.gov/pesticides/cumulative/pra-op/

3. Environmental Protection Agency. Office of Pesticide Programs. OPCRA Access Database. June 2, 2002 version available at: http://www.epa.gov/pesticides/cumulative/rra-op/

Appendix A. Residue values used for small grains in the three model runs

Table 2. Total Residue on Oat Food Forms				
Commodity	Food Form	OPCRA	Half Reldan	Full Reldan
15002310 (Oat, bran)	15			
	130	0.0000002	0.00000387	0.0000075
	210	0.0000002	0.00000152	0.0000028
	211	0.0000002	0.00000152	0.0000028
	214	0.0000002	0.00000152	0.0000028
	230	0.0000002	0.00000152	0.0000028
	231	0.0000002	0.00000152	0.0000028
	232	0.0000002	0.000000295	0.00000039
	233	0.0000002	0.00000152	0.0000028
15002320 (Oat, flour)	15			
	230	0.00000027	0.00000027	0.00000027
	240	0.00000027	0.00000027	0.00000027
15002321 (Oat, flour, babyfood)	15			
	230	0.00000027	0.00000027	0.00000027
	240	0.00000027	0.00000027	0.00000027
15002330 (Oats, groats/ rolled oats)	15			
	110	0.00000027	0.00000027	0.00000027
	130	0.00000027	0.00000027	0.00000027
	210	0.00000027	0.00000027	0.00000027
	211	0.00000027	0.00000027	0.00000027
	212	0.00000027	0.00000027	0.00000027
	213	0.00000027	0.00000027	0.00000027
	214	0.00000027	0.00000027	0.00000027
	221	0.00000027	0.00000027	0.00000027
	230	0.00000027	0.00000027	0.00000027
	231	0.00000027	0.00000027	0.00000027
	232	0.00000027	0.00000027	0.00000027
	233	0.00000027	0.00000027	0.00000027
15002331 (Oats, groats/ rolled oats, babyfood)	15			
	240	0.00000027	0.00000027	0.00000027

Table 3. Total Residue on Wheat Food Forms				
Commodity	Food Form	OPCRA	Half Reldan	Full Reldan
15004010 (Wheat grain)	15			
	110	0.000226	0.0006044	0.0009827
	120	0.000226	0.0006044	0.0009827
	210	0.000212	0.0003744	0.0005366
	211	0.000212	0.0003744	0.0005366

	212	0.000212	0.000224	0.0002357
	213	0.000212	0.0003744	0.0005366
	214	0.000212	0.0003744	0.0005366
	215	0.000212	0.000224	0.000224
	221	0.000212	0.0003744	0.0005366
	223	0.000212	0.0003744	0.0005366
	230	0.000212	0.0003744	0.0005366
	231	0.000212	0.0003744	0.0005366
	232	0.000212	0.000224	0.000224
	233	0.000212	0.0003744	0.0005366
	240	0.00017	0.0005483	0.0009266
15004011 (Wheat grain, babyfood)	15			
	230	0.000226	0.0006044	0.0009827
	240	0.00017	0.0005483	0.0009266
15004020 (Wheat, flour)	15			
	110	0.000116	0.0005659	0.0010163
	120	0.000135	0.0002776	0.0004362
	130	0.000116	0.0005659	0.0010163
	150	0.000135	0.0002776	0.0004362
	210	0.000112	0.0002741	0.0004362
	211	0.000116	0.0002776	0.0004362
	212	0.000104	0.0001157	0.0001274
	213	0.000116	0.0002776	0.0004362
	214	0.000116	0.0002776	0.0004362
	215	0.000104	0.0001157	0.0001274
	220	0.000112	0.0002741	0.0004362
	221	0.000116	0.0002776	0.0004362
	222	0.000112	0.0002741	0.0004362
	223	0.000116	0.0002776	0.0004362
	224	0.000112	0.0002741	0.0004362
	230	0.000112	0.0002741	0.0004362
	231	0.000116	0.0002776	0.0004362
	232	0.000104	0.0001157	0.0001274
	233	0.000116	0.0002776	0.0004362
	240	0.00011	0.0001212	0.0001329
	242	0.000102	0.0001133	0.0001329
	250	0.000104	0.0002776	0.0004362
	251	0.000116	0.0002776	0.0004362
	252	0.000104	0.0001157	0.0001274
	253	0.000116	0.0002776	0.0004362
15004021 (Wheat flour, babyfood)	15			
	110	0.000116	0.0005659	0.0010163
	130	0.000116	0.0005659	0.0010163
	211	0.000116	0.0002776	0.0004362
	230	0.000112	0.0002741	0.0004362
	231	0.000116	0.0002776	0.0004362
	240	0.00011	0.0001212	0.0001329
15004030 (Wheat germ)	15			

	210	0.000303	0.0004651	0.0006273
	211	0.000321	0.0004831	0.0006452
	212	0.000125	0.000137	0.0001487
	230	0.000303	0.0004651	0.0006273
	232	0.000125	0.000137	0.0001487
15004040 (Wheat bran)	15			
	130	0.00033	0.0007806	0.001231
	210	0.000319	0.0004816	0.0006437
	211	0.000319	0.0004816	0.0006437
	212	0.000319	0.0004816	0.0006437
	213	0.000319	0.0004816	0.0006437
	214	0.000319	0.0004816	0.0006437
	221	0.000319	0.0004816	0.0006437
	230	0.000319	0.0004816	0.0006437
	231	0.000319	0.0004816	0.0006437
	232	0.000319	0.0004816	0.0006437
	233	0.000319	0.0004816	0.0006437

Table 4. Total Residue on Rice Food Forms

Commodity	Food Form	OPCRA	Half Reldan	Full Reldan
15003230 Rice, white	All	0.00000311	0.00000324	0.00000336
15003231 Rice, white, babyfood	All	0.00000311	0.00000324	0.00000336
15003240 Rice, brown	All	0.00000311	0.00000324	0.00000336
15003241 Rice, brown, babyfood	All	0.00000311	0.00000324	0.00000336
15003250 Rice flour	All	0.00000311	0.00000324	0.00000336
15003251 Rice flour, babyfood	All	0.00000311	0.00000324	0.00000336
15003260 Rice bran	All	0.00000311	0.00000324	0.00000336
15003261 Rice bran, babyfood	All	0.00000311	0.00000324	0.00000336

Appendix B. "Baseline" EPA Cumulative Dietary Exposure Assessment

Random number seed = 10; Four subpopulations

```
U.S. Department of Agriculture                                        Ver. 1.15
DEEM-FCID ACUTE Analysis for CUMULATIVE OP EXPOSURE                 (1994-98 data)
Residue file: OPCRA.R98                                  Adjustment factor #2 used.
Analysis Date: 02-21-2003/16:44:51    Residue file dated: 05-09-2002/14:13:15/19
NOEL (Acute) =    0.080000 mg/kg body-wt/day
Daily totals for food and foodform consumption used.
MC iterations = 1000      MC list in residue file      MC seed = 10
Run Comment: "OPCRA: Baseline Assessment with FQPA factors"
================================================================================

Summary calculations (per capita):

                     95th Percentile      99th Percentile      99.9th Percentile
                    Exposure     MOE     Exposure     MOE     Exposure     MOE
                   ---------- -------  ---------- -------  ---------- -------
Custom demographics 1: Kids 1-2:
                    0.000226      353    0.000623      128    0.001761       45
Custom demographics 2: Kids 3-5:
                    0.000183      437    0.000504      158    0.001492       53
Custom demographics 3: Adults 20 - 49:
                    0.000062     1286    0.000182      439    0.000546      146
Custom demographics 4: Adults 50+:
                    0.000070     1136    0.000198      403    0.000573      139
```

Random number seed = 10; Two subpopulations

```
U.S. Department of Agriculture                                        Ver. 1.15
DEEM-FCID ACUTE Analysis for CUMULATIVE OP EXPOSURE                 (1994-98 data)
Residue file: OPCRA.R98                                  Adjustment factor #2 used.
Analysis Date: 02-23-2003/16:09:37    Residue file dated: 05-09-2002/14:13:15/19
NOEL (Acute) =    0.080000 mg/kg body-wt/day
Daily totals for food and foodform consumption used.
MC iterations = 1000      MC list in residue file      MC seed = 10
Run Comment: "OPCRA: Baseline Assessment with FQPA factors"
================================================================================

Summary calculations (per capita):

                     95th Percentile      99th Percentile      99.9th Percentile
                    Exposure     MOE     Exposure     MOE     Exposure     MOE
                   ---------- -------  ---------- -------  ---------- -------
Custom demographics 1: kids 1-2:
                    0.000225      354    0.000621      128    0.001729       46
Custom demographics 2: kids 3-5:
                    0.000183      438    0.000504      158    0.001485       53
```

Appendix C. Cumulative Orgaonphosphate Dietary Exposure Assessment including Reldan at half-application rate

Random number seed = 10; Two subpopulations

```
U.S. Department of Agriculture                                    Ver. 1.15
DEEM-FCID ACUTE Analysis for CUMULATIVE OP EXPOSURE WITH HALF APPLICATION OF
RELDAN
                                                                (1994-98 data)
Residue file: HalfPER.R98                          Adjustment factor #2 used.
Analysis Date: 02-25-2003/13:24:53    Residue file dated: 02-23-2003/14:04:06/19
NOEL (Acute) =    0.080000 mg/kg body-wt/day
Daily totals for food and foodform consumption used.
MC iterations = 1000      MC list in residue file     MC seed = 10
Run Comment: "OPCRA: Baseline Assessment with FQPA factors including half appl
ication of Reldan"
================================================================================

Summary calculations (per capita):

                      95th Percentile      99th Percentile      99.9th Percentile
                     Exposure     MOE     Exposure     MOE     Exposure     MOE
                     ---------- --------  ---------- --------  ---------- --------
Custom demographics 1: kids 1-2:
                     0.000227       352    0.000624       128    0.001760        45
Custom demographics 2: kids 3-5:
                     0.000183       436    0.000505       158    0.001492        53
Custom demographics 3: adults 20-49:
                     0.000062      1282    0.000182       438    0.000546       146
Custom demographics 4: adults 50-99:
                     0.000071      1133    0.000198       403    0.000573       139
```

Random number seed = 10; Four subpopulations

```
U.S. Department of Agriculture                                    Ver. 1.15
DEEM-FCID ACUTE Analysis for CUMULATIVE OP EXPOSURE WITH HALF APPLICATION OF
RELDAN
                                                                (1994-98 data)
Residue file: HalfPER.R98                          Adjustment factor #2 used.
Analysis Date: 02-23-2003/14:13:35    Residue file dated: 02-23-2003/14:04:06/19
NOEL (Acute) =    0.080000 mg/kg body-wt/day
Daily totals for food and foodform consumption used.
MC iterations = 1000      MC list in residue file     MC seed = 10
Run Comment: "OPCRA: Baseline Assessment with FQPA factors including half appl
ication of Reldan"
================================================================================

Summary calculations (per capita):

                      95th Percentile      99th Percentile      99.9th Percentile
                     Exposure     MOE     Exposure     MOE     Exposure     MOE
                     ---------- --------  ---------- --------  ---------- --------
Custom demographics 1: Kids 1-2:
                     0.000226       353    0.000621       128    0.001729        46
Custom demographics 2: Kids 3-5:
                     0.000183       436    0.000505       158    0.001486        53
```

Appendix D. Cumulative Organophosphate Dietary Exposure Assessment including Reldan at full application rate.

Random number seed = 10; Four subpopulations

```
U.S. Department of Agriculture                                    Ver. 1.15
DEEM-FCID ACUTE Analysis for CUMULATIVE OP EXPOSURE WITH FULL APPLICATION OF
RELDAN
                                                                  (1994-98 data)
Residue file: FullPER.R98                          Adjustment factor #2 used.
Analysis Date: 02-25-2003/15:28:24    Residue file dated: 02-23-2003/14:04:49/19
NOEL (Acute) =    0.080000 mg/kg body-wt/day
Daily totals for food and foodform consumption used.
MC iterations = 1000      MC list in residue file     MC seed = 10
Run Comment: "OPCRA: Baseline Assessment with FQPA factors including full appl
ication of Reldan"
================================================================================

Summary calculations (per capita):

                     95th Percentile      99th Percentile      99.9th Percentile
                    Exposure     MOE     Exposure     MOE     Exposure     MOE
                   ---------- --------  ---------- --------  ---------- --------
Custom demographics 1: kids 1-2:
                    0.000227      351    0.000624      128    0.001761       45
Custom demographics 2: kids 3-5:
                    0.000184      434    0.000505      158    0.001493       53
Custom demographics 3: adults 20-49:
                    0.000063     1277    0.000183      438    0.000547      146
Custom demographics 4: adults 50-99:
                    0.000071     1130    0.000199      402    0.000573      139
```

Random number seed = 10; Two subpopulations

```
U.S. Department of Agriculture                                    Ver. 1.15
DEEM-FCID ACUTE Analysis for CUMULATIVE OP EXPOSURE WITH FULL APPLICATION OF
RELDAN
                                                                  (1994-98 data)
Residue file: FullPER.R98                          Adjustment factor #2 used.
Analysis Date: 02-23-2003/14:23:19    Residue file dated: 02-23-2003/14:04:49/19
NOEL (Acute) =    0.080000 mg/kg body-wt/day
Daily totals for food and foodform consumption used.
MC iterations = 1000      MC list in residue file     MC seed = 10
Run Comment: "OPCRA: Baseline Assessment with FQPA factors including full appl
ication of Reldan"
================================================================================

Summary calculations (per capita):

                     95th Percentile      99th Percentile      99.9th Percentile
                    Exposure     MOE     Exposure     MOE     Exposure     MOE
                   ---------- --------  ---------- --------  ---------- --------
Custom demographics 1: Kids 1-2:
                    0.000227      353    0.000622      128    0.001731       46
Custom demographics 2: Kids 3-5:
                    0.000184      435    0.000505      158    0.001487       53
```

Appendix E. DEEM-FCID files