OFFICE OF INSPECTOR GENERAL

Catalyst for Improving the Environment

Supplemental Report

Details on Dietary Risk Data in Support of Report No. 2006-P-00028, "Measuring the Impact of the Food Quality Protection Act: Challenges and Opportunities"

August 1, 2006

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Abbreviations

aPAD	Acute Population Adjusted Doses
aRfD	Acute Reference Doses
cPAD	Chronic Population Adjusted Doses
cRfC	Chronic Reference Concentration
cRfD	Chronic Reference Doses
CRS	Chronic Risk Share
DRI	Dietary Risk Index
EPA	U.S. Environmental Protection Agency
FQPA	Food Quality Protection Act
PAD	Population Adjusted Dose
PDP	Pesticide Data Program
PRL_{99}	Projected 99^{th} Residue Level
$cRfC_{sf}$	Single-food Chronic Reference Concentration
USDA	U.S. Department of Agriculture

Methodology on Approach to Track Risk Mitigation Using Dietary Pesticide Residual Data from U.S. Department of Agriculture's Pesticide Data Program

We conducted an analysis of the dietary pesticide residue data from the U.S. Department of Agriculture's (USDA's) Pesticide Data Program (PDP) to evaluate the impact of the Food Quality Protection Act (FQPA) on dietary pesticide exposure risk for children.[1] A methodology was developed to track changes in dietary pesticide risk levels between 1994 to 2003 in USDA's pesticide residue data from the PDP.

The U.S. Environmental Protection Agency (EPA) regulates dietary risks under the FQPA at the 99.9th percentile level of exposure, based on a probabilistic distribution of dietary exposures. Monte Carlo simulation methods are used to generate hundreds of thousands to millions of "eating day episodes" for a person of known weight. Each "eating day" estimate of pesticide exposure is based on the actual foods reported as eaten in USDA's food consumption survey. Each food reported as eaten is linked to a distinct record in the pesticide residue data file for the same food. The computer randomly selects a residue value from the file, such that the most common levels (usually zero residue) are chosen more frequently, and higher residue levels are picked only as frequently as they appeared in PDP sampling. An estimate is made of a person's daily exposure to a given pesticide by multiplying the amount of each food the person consumed (in kilograms) by the concentration of the residue in each food (in parts per million, or milligrams per kilogram). These estimates for a given pesticide are then aggregated across all the foods the person consumed in a given day, and the results are arrayed from the highest to the lowest, based on the milligrams of pesticide consumed per kilogram of body weight.

Under science policies developed to guide implementation of the FQPA, EPA strives to assure that pesticide tolerances are set at levels safe for all population subgroups. Typically, the age group that is exposed to the greatest amount of pesticides per kilogram of body weight is 1-to-2-year-old children. Hence, we focused on children's exposure and risk levels in this report. A tolerance level is regarded as acceptable if the child at the 99.9th percentile level[2] of the exposure distribution curve is exposed to less of a pesticide than allowed, given the weight of the child and the pesticide's acute Population Adjusted Doses (aPAD) or chronic Population Adjusted Doses (cPAD). Risk reduction measures are typically invoked in cases where EPA judges that risks at the 99.9th level are excessive.

Our contractor analyzed the distribution of both food consumption data and pesticide residue levels to produce an estimate of dietary risk that reflects the upper end of the pesticide exposure distribution. By "upper-end," we mean between the 95th and 99.9th levels of exposure. We approximate the 99.9th level of exposure to a given pesticide by combining estimates of food

[1] Some of the analysis work was conducted through a contract with Benbrook Consulting Services, Sandpoint, Idaho.

[2] Hereafter in this report, the 95th, 99th, or 99.9th percentile level of a distribution of values are referred to as just the 95th, 99th, or 99.9th level.

consumption that reflect approximately the 95th level of consumption, with an estimate of pesticide residue levels at about the 99th level of the distribution of positive values.

Dietary Risk Index

Our basic unit of measure used to track pesticide dietary risks is called the Dietary Risk Index (DRI). DRI values or scores are calculated for each pesticide-food combination covered in the annual testing carried out by the PDP. For a given food and year, DRI values for each pesticide found in the food are added together, to form an aggregate, food-level DRI score.

Single-food and aggregate DRI scores are calculated for three sets of residue data: food grown, harvested, and processed in the United States (domestic production); residue in food that is imported into the United States; and all samples tested by the PDP in a given year (domestic plus imported samples, plus samples of unknown origin). Trends over time in aggregate food-level DRI scores provide insights into changes in overall risk levels and the relative share of total risk accounted for by residues in imports versus domestic foods.

Our contractor calculated DRIs using assumptions, methods, and data as close as possible to those called for in FQPA science policies and adhered to in recent EPA dietary risk assessments.

The DRI is calculated from two variables:

- "Percent Positive" - How frequently a pesticide residue is found in a food; and
- "Chronic Risk Share" - The level of risk associated with the residues of a pesticide found in a food, taking into account the pesticide's toxicity, the amount of food typically eaten by children, and the mean of the residues found in positive samples.

The basic formula to calculate the DRI score for a given pesticide-food combination is

DRI = (Percent Positive) x (Chronic Risk Share)

The "Percent Positive" variable is calculated from PDP data and equals the number of positive samples tested in a given year, divided by the total number of samples. For each pesticide-food combination, there are up to three "Percent Positive" values: one representing the results for domestic samples, one for imports, and one for all samples combined.[3]

DRI values can be calculated based on acute Reference Doses (aRfD) and aPAD, as well as chronic Reference Doses (cRfD) and cPAD. The analysis of dietary risk trends in this report is based on chronic risks, because EPA has not established aRfD for a majority of pesticides.

[3] Each year, the PDP tests a few samples of "unknown origin." These samples are excluded from both the domestic production and imports analyses, but are included in the "combined" analyses. This is why the sum of samples, and the sum of positives in the domestic plus imported samples, sometimes is less than the number of samples and positives in the combined analysis.

Chronic Risk Share

The Chronic Risk Share (CRS) is a new analytical concept developed for this report. It is designed to help answer a simple question – "How risky are the residues found in a given food?" The CRS is a measure of the degree to which the residues found in the food, as reported in PDP results, fill up the pesticide's "risk cup" for a person of known weight.[4]

A CRS for a given pesticide-food combination is calculated from two components. The first is called the "Projected 99th Residue Level" (or PRL_{99}), which is an estimate of the residue level found in the food at about the 99th percentile level of the distribution of residues ranked from the lowest to the highest.

The second component used to calculate the CRS is the pesticide's single-food chronic Reference Concentration (cRfC). Four variables are needed to calculate a single-food cRfC for a person of known weight – the average amount of food consumed by the person; the weight of the person; the toxicity of the pesticide; and the magnitude of exposures from other foods, beverages, or pesticide uses around the home, schools, or other residential settings. A single-food cRfC is an estimate of the concentration of a pesticide that can be present in a serving of a given food, without exceeding the person's chronic PAD. The CRS for a given pesticide-food combination is calculated as follows

$$\mathbf{CRS} = \frac{(\mathbf{PRL_{99}})}{(\textbf{Single-Food cRfC})}$$

In cases where the PRL^{99} exceeds the applicable single-food cRfC, the value of the CRS will be greater than one. In such cases, a small portion of the people consuming the food in a given day is likely to receive a dose of the pesticide above the level EPA regards as acceptable. The smaller the value of the CRS, the less worrisome the dietary risks stemming from the residues present in a given food. For example, if even the 99th percentile residue level accounts for only one-tenth of the pesticide's single food cRfC, there is little reason for concern from dietary exposure, especially when EPA is confident that it has fully accounted for all other routes of exposure in setting the single-food cRfC.

[4] EPA introduced the "risk cup" concept to help explain the impact of the FQPA on the allowable level of exposure to a given pesticide through all routes of exposure, taking into account whether any other pesticides pose risks through a common mechanism of action. The "risk cup" is a graphical representation of the acceptable amount of exposure to a given pesticide for a person of known weight. The size of the risk cup is typically reported in milligrams of pesticide per day, and is based on the pesticide's inherent toxicity and the average weight of a child exposed to the pesticide.

Projected 99th Residue Levels

The Consumers Union[5] studied the distribution of residue levels found in 53 food-pesticide combinations based on PDP testing in 1997 (Consumers Union/Natural Resources Defense Council, 1999).[6] For each pesticide food combination, the Consumers Union identified the minimum and maximum residue, the mean of the positives, and the residue level at the 99.9th, 99th, and 95th levels of the distribution. Ratios were also calculated showing the difference between the 99.9th level and the mean, the 99th level and the mean, and the 95th level and the mean.

The average difference between the 99.9th residue and the mean of the positives across the 53 food-pesticide combinations was 8.5. The difference between the 99th and the mean residue level was 6.1. To estimate dietary risks close to the 99.9th level chosen by EPA as the threshold of regulation, we selected a value of 7 as the average difference between the mean residue level and the PRL_{99} value. Accordingly, the formula for estimating the PRL_{99} level for a given pesticide-food combination is:

$$\mathbf{PRL_{99} = (Mean\ residue) \times 7}$$

Single-Food Chronic Reference Concentrations

The single-food chronic Reference Concentration, or $cRfC_{sf}$, can be thought of as an initial estimate of the maximum level of a pesticide that can be present in a given food without violating the FQPA's basic "reasonable certainty of no harm" standard. This key concept is useful both in tracking changes in pesticide dietary risks and in setting the maximum levels for pesticide tolerances in food as eaten.

A $cRfC_{sf}$ for a given pesticide will change as a function of the weight of a child and the amount (weight) of a specific food the child consumes during a day. In carrying out an analysis of changes over time in pesticide dietary risks, the assumptions used to set $cRfC_{sf}$ levels are less important than using consistent assumptions across all foods. This is because the goal is to identify changes in relative risk levels over time and across foods and pesticides, rather than estimating risk levels at a specific point in time, for comparison to some quantitative standard.

The formula to calculate a cRfC for all foods and routes of exposure is:

$$\mathbf{cRfC\ (mg/kg) \times Serving\ Size\ Food_y\ (grams/day) = Weight\ of\ Child\ (kg) \times cPAD\ for\ Pesticide_x\ (mg/kg/day)}$$

[5] Consumers Union is an independent nonprofit organization with a mission "to work for a fair, just, and safe marketplace for all consumers and to empower consumers to protect themselves." The organization accepts no outside advertising and no free test samples. Consumers Union supports itself through the sale of information products and services, individual contributions, and a few noncommercial grants. It has published a long list of FQPA-relevant reports since 1996.

[6] For a complete discussion of the Consumers Union/Natural Resources Defense Council analysis of the distribution of PDP residue levels, see the comments submitted to EPA on June 6, 1999, on the Science Policy Paper, "Choosing a Percentile of Acute Dietary Exposure as a Threshold of Regulatory Concern" (Consumers Union, 1999; posted at http://www.ecologicipm.com/999_comments.pdf).

This equation can be solved for cRfC by converting the grams of food on the left side of the equation to kilograms of food, and then dividing by "Serving Size Food$_x$:

$$\textbf{cRfC (mg/kg)} = \frac{\textbf{Weight of Child (kg) x cPAD (mg/kg/day)}}{\textbf{Serving Size Food}_y\textbf{ (kg/day)}}$$

The weight of the child used in this report to calculate cRfC values is 16 kilograms. This is the value corresponding to the 50th percentile of growth for a 4-year-old male, as reported on the Centers for Disease Control and Prevention Growth Chart. EPA sets pesticide cPADs based on animal experiments, after applying a set of safety factors to the "No Observable Adverse Effect Level" for the most sensitive biological impact considered relevant in assessing the pesticide's toxicity.

Our contractor analyzed the distribution of food consumption values for children's foods based on USDA's "Continuing Survey of Food Intake by Individuals" (commonly referred to as the CSFII survey). The survey contains 5,372 valid eating days for 1-to-5-year-old children. For each of these foods, the most common amount reported was either exactly equal to, or close to what the USDA reports as, the typical serving size in its National Nutrient Database for Standard Reference (Release 17).[7] In general, the 95th level of consumption is at least two-thirds larger than the typical serving size reported by USDA. We have listed in the table below foods and their portion sizes used in our calculations. When we lacked data from USDA on the portion size at the 95th level of consumption, we multiplied the typical serving size by 1.667.

Estimated 95th Percentile Food Consumption Levels Used in Calculating Chronic Risk Shares and Dietary Risk Index Values

	Approximate Equivalent Serving at 95th Level of Consumption	95th Percentile (grams)
Apple Juice	3 cups	744
Apples	1 large	212
Bananas	1 large	136
Broccoli, raw	1.667 stalks	247
Cantaloupe, fresh	1.33 cups	223
Carrots	1 large	72
Celery	2.5 large stalks	183
Cucumbers	1- 8"	301
Grapes, red or green, raw	1.33 cups	210
Green Beans, fresh, raw	1.667 cups	183
Lettuce	2 cups	148
Oranges	1 large	184
Peaches	1 large	157
Pears	2 medium	332
Potatoes, baked with skin	1 large	300
Spinach, raw	1.667 cups	50
Sweet Bell Peppers	1 medium	119
Tomatoes, raw	2 medium	247

[7] Accessible at http://www.nal.usda.gov/fnic/foodcomp/Data/SR17/sr17.html

Children are typically exposed to a given pesticide through more than one food. Pesticides that appear in foods may also sometimes be present in fruit juices, other beverages, and drinking water. In addition, the FQPA directed EPA to take into account residential, schoolyard, and all other potential routes of exposure to a pesticide in setting and reviewing tolerances. For these reasons, if a single food accounts for the total allowed exposure to a pesticide on a given day, the child would almost certainly be overexposed because of residues in other foods and drinks, and possibly residential exposures.

In its October 13, 2000 comments to EPA on chlorpyrifos risk mitigation (Consumers Union, 2000),[8] the Consumers Union recommended that EPA not allow any single food use of a pesticide, including chlorpyrifos, to account for more than 10 percent of the pesticide's risk cup, at least not until EPA completed its cumulative risk assessment of the organophosphates and had taken all regulatory actions needed to meet the FQPA's "reasonable certainty of no harm" standard. We have incorporated this recommendation into the calculation of "Single-Food Chronic Reference Concentrations," which equal the total cRfC for a pesticide divided by 10.[9]

[8] Accessible at http://www.ecologic-ipm.com/Chlorpyrifos_comments_2000.pdf

[9] This assumption likely biases single-food cRfC values upward for pesticides that appear routinely as residues in more than 10 foods. Likewise, $cRfC_{sf}$ values for pesticides found in just a few foods, and also not used in residential settings, are probably biased downward. These sources of bias do not impact the validity of results when single food cRfC values are used consistently in projecting relative dietary risk levels over time and across foods and pesticides.

Aggregate Dietary Risk Index Values for Selected Foods

Aggregate Dietary Risk Index Values for Selected Foods Grown Domestically, Imported to the United States, and for Domestically Grown Plus Imported Foods: PDP Test Results for 1994-2003, With Interpolated Values for Un-sampled Years

Crop		1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
Apple Juice	Domestic	**18.08**[10]	**18.08**	18.08	32.73	26.67	**21.25**	**15.83**	**10.41**	4.99	**4.99**
	Import	**97.44**	**97.44**	97.44	67.15	28.27	**22.45**	**16.64**	**10.82**	5.00	**5.00**
Apples	Domestic	316.00	295.48	359.35	**299.63**	**239.90**	180.18	144.33	144.15	43.65	**43.65**
	Import	236.67	289.35	510.83	**581.63**	**652.43**	723.23	**410.10**	96.97	30.21	**30.21**
Broccoli	Domestic	8.83	**11.58**	**14.33**	**17.09**	**19.84**	**22.59**	**25.35**	28.10	12.91	**12.91**
	Import	97.05	**98.82**	**100.59**	**102.36**	**104.13**	**105.89**	**107.66**	109.43	62.29	**62.29**
Cantaloupe	Domestic	**36.66**	**36.66**	**36.66**	**36.66**	36.66	55.46	85.46	**62.15**	**38.85**	15.54
	Import	**56.23**	**56.23**	**56.23**	**56.23**	56.23	100.55	118.69	**89.42**	**60.15**	30.87
Carrots	Domestic	11.40	11.17	13.79	**13.29**	**12.79**	**12.29**	11.78	9.46	9.82	**9.82**
	Import	37.34	38.26	28.92	**38.10**	**47.27**	**56.45**	65.62	25.08	30.26	**30.26**
Celery	Domestic	91.60	**90.43**	**89.26**	**88.09**	**86.91**	**85.74**	**84.57**	83.40	104.49	**104.49**
	Import	50.41	**143.18**	**235.95**	**328.72**	**421.49**	**514.26**	**607.03**	699.80	170.00	**170.00**
Cucumbers	Domestic	**343.42**	**343.42**	**343.42**	**343.42**	**343.42**	343.42	236.64	**157.04**	77.45	92.75
	Import	**460.92**	**460.92**	**460.92**	**460.92**	**460.92**	460.92	443.69	**354.86**	266.03	317.16
Grapes	Domestic	404.46	177.58	128.55	**101.78**	**75.00**	**48.22**	21.44	18.54	**18.54**	**18.54**
	Import	194.17	240.79	381.66	**402.80**	**423.94**	**445.07**	466.21	281.75	**281.75**	**281.75**
Green Beans	Domestic	378.04	293.97	**311.45**	**328.94**	**346.42**	**363.91**	381.39	330.10	**330.10**	**330.10**
	Import	80.65	40.49	**48.71**	**56.92**	**65.13**	**73.34**	81.55	93.31	**93.31**	**93.31**
Lettuce	Domestic	152.13	**123.96**	**95.79**	**67.62**	**39.46**	11.29	12.87	54.60	**54.60**	**54.60**
	Import	**90.38**	**90.38**	**90.38**	**90.38**	**90.38**	90.38	325.58	925.79	**925.79**	**925.79**
Oranges	Domestic	37.47	16.03	28.48	**22.27**	**16.06**	**9.85**	3.64	4.00	**4.00**	**4.00**
	Import	**2.26**	2.26	**2.08**	**1.91**	**1.73**	**1.55**	1.37	1.65	**1.65**	**1.65**

[10] **The DRI values in red are interpolated or extrapolated from the values in years when PDP tested the food based on two assumptions**:

1. The DRI value in the first year a food was tested was assigned to any earlier years back to 1994, and the DRI value in the last year the food was tested was assigned to any years after, up to and including 2003.
2. In cases with a gap between PDP samplings, we assumed that DRI values changed linearly during the time period when the food was not included in the program.

Aggregate Dietary Risk Index Values for Selected Foods Grown Domestically, Imported to the United States, and for Domestically Grown Plus Imported Foods: PDP Test Results for 1994-2003, With Interpolated Values for Un-sampled Years											
Crop		**1994**	**1995**	**1996**	**1997**	**1998**	**1999**	**2000**	**2001**	**2002**	**2003**
Peaches	Domestic	766.07	942.95	836.73	**687.27**	**537.80**	**388.34**	**238.88**	89.42	54.06	**54.06**
	Import	84.63	129.21	150.63	**167.28**	**183.93**	**200.58**	**217.23**	233.88	266.11	**266.11**
Potatoes	Domestic	84.86	72.73	**64.45**	**56.16**	**47.88**	**39.60**	31.32	64.11	73.80	**73.80**
	Import	6.00	12.53	**14.41**	**16.28**	**18.16**	**20.03**	**21.91**	23.78	22.45	**22.45**
Spinach	Domestic	**52.59**	52.59	37.71	28.84	**27.36**	**25.88**	**24.41**	**22.93**	21.45	17.88
	Import	**27.47**	27.47	83.69	16.21	**13.57**	**10.93**	**8.29**	**5.65**	3.01	9.08
Sweet bell peppers	Domestic	**243.25**	**243.25**	**243.25**	**243.25**	**243.25**	243.25	180.80	**164.49**	148.18	132.02
	Import	**1,067.45**	**1,067.45**	**1,067.45**	**1,067.45**	**1,067.45**	1,067.45	874.19	**658.74**	443.29	720.25
Tomatoes	Domestic	**175.92**	**175.92**	175.92	189.91	123.37	103.36	**94.62**	**85.88**	**77.14**	68.40
	Import	**543.88**	**543.88**	543.88	580.21	453.44	478.62	**394.37**	**310.12**	**225.87**	141.62

Total and Average Dietary Risk Index Values (With Values Interpolated for Un-sampled Years)											
TOTAL DIETARY RISK INDEX (DRI)*	Domestic	3,120.76	2,905.78	2,797.21	2,556.94	2,222.81	1,954.64	1,593.34	1,328.78	1,074.01	1,037.53
	Import	3,132.95	3,338.68	3,873.76	4,034.53	4,088.44	4,371.69	4,160.12	3,921.04	2,887.16	3,107.81
Average DRI Values	Domestic	195.05	181.61	174.83	159.81	138.93	122.16	99.58	83.05	67.13	64.85
	Import	195.81	208.67	242.11	252.16	255.53	273.23	260.01	245.06	180.45	194.24
Total and Average Dietary Risk Index Values (With Missing Values for Un-sampled Years)											
TOTAL DIETARY RISK INDEX (DRI)*	Domestic	2,250.84	1,862.48	1,598.61	251.49	186.71	936.96	1,109.68	825.87	550.78	326.58
	Import	786.92	780.38	1,797.05	663.57	537.94	2,921.15	2,376.90	2,491.43	1,298.64	1,218.99
Number of Foods Tested	Domestic	10	8	8	3	3	6	10	10	10	5
	Import	8	8	7	3	3	6	8	10	10	5
Average DRI Values	Domestic	225.08	232.81	199.83	83.83	62.24	156.16	110.97	82.59	55.08	65.32
	Import	98.37	97.55	256.72	221.19	179.31	486.86	297.11	249.14	129.86	243.80

Impact of EPA Actions on Risk Driver Pesticide-Food Combinations from Domestic Commodities

Impact of EPA Actions on Risk Driver Pesticide-Food Combinations from Domestic Commodities (Ranked by Percentage Change in Dietary Risk Index Levels from the Pre-FQPA Period)				
Commodity	**Pesticide**	**DRI Score**	**Year**	**Change in DRI Score**
Grapes	Parathion methyl	0.0	2001	-100%
		329.1	1994	
Green Beans, Processed	Parathion methyl	0.0	2004	-100%
		22.6	1996	
Peaches	Parathion methyl	0.0	2004	-100%
		799.4	1996	
Pears	Parathion methyl	0.0	2003	-100%
		78.1	1997	
Apples	Parathion methyl	0.0	2004	-100%
		52.0	1996	
Tomatoes	Chlorpyrifos	0.0	2004	-100%
		36.8	1997	
Wheat Flour	Chlorpyrifos methyl	0.0	2004	-100%
		149.2	1996	
Spinach, Processed	Parathion ethyl	0.6	1999	-99%
		88.2	1998	
Apples	Chlorpyrifos	3.6	2002	-98%
		207.3	1996	
Strawberries	Vinclozolin	4.4	2000	-93%
		65.7	1998	
Grapes	Dicofol p,p'	12.3	2001	-85%
		82.7	1996	
Green Beans, Processed	Methamidophos	15.2	2003	-83%
		89.1	1996	
Strawberries	Dicofol p,p'	13.4	2000	-80%
		67.3	1998	
Tomatoes	Methamidophos	34.9	2003	-76%
		143.4	1996	
Cucumbers	Dieldrin	33.6	2003	-70%
		111.3	1999	
Sweet Bell Peppers	Chlorpyrifos	20.7	2003	-68%
		65.0	1999	
Pears	Azinphos methyl	19.6	2003	-67%
		58.6	1997	

Impact of EPA Actions on Risk Driver Pesticide-Food Combinations from Domestic Commodities (Ranked by Percentage Change in Dietary Risk Index Levels from the Pre-FQPA Period)				
Commodity	**Pesticide**	**DRI Score**	**Year**	**Change in DRI Score**
Winter Squash	Dieldrin	77.8	1999	-57%
		179.3	1997	
Cucumbers	Methamidophos	13.4	2003	-55%
		29.8	1999	
Sweet Bell Peppers	Methamidophos	60.9	2003	-49%
		119.1	1999	
Green Beans	Endosulfans or endosulfan sulfate	20.0	2001	- 47%
		37.6	1995	
Strawberries, Processed	Dicofol p,p'	22.8	2000	-37%
		36.1	1998	
Winter Squash, Processed	Dieldrin	228.5	1999	-36%
		354.4	1997	
Green Beans	Dimethoate	20.6	2001	-31%
		30.0	1994	
Green Beans	Acephate	55.5	2001	9%
		51.0	1994	
Green Beans	Methamidophos	205.1	2001	23%
		166.3	1995	
Celery	Acephate	36.5	2002	25%
		29.2	1994	
Strawberries, Processed	Vinclozolin	31.6	2000	77%
		17.9	1998	
Potatoes	Chlorpropham	61.1	2002	114%
		28.5	1995	
Peaches	Dicofol p,p'	16.6	2001	1975%
		0.8	1996	
Impact of EPA Actions	1649.0	%	The two columns to the right show how nine EPA actions reduced DRI scores in this table. Nine EPA actions reduced DRI scores by about 1650; EPA revoked the tolerances for 7 of the 30 risk pairs listed (6 parathion food uses and chlorpyrifos in tomatoes), substantially lowered the tolerance for chlorpyrifos in apples, and modestly lowered the tolerance for azinphos-methyl for pears. The actions taken on methyl or ethyl parathion resulted in an aggregate drop in DRI scores of about 1370, or 83 percent of the total impact triggered by tolerance revocations. The changes in chlorpyrifos tolerances reduced aggregate DRI scores by 240. Taken together, tolerance revocations and reductions imposed on eight uses of methyl and ethyl parathion and chlorpyrifos accounted for 98 percent of the total impact of EPA actions on the above set of information.	
Parathions	1369.4	83%		
Chlorpyrifos	240.5	15%		
Para+chlor	1610.0	98%		

Impact of EPA Actions on Risk Driver Pesticide-Food Combinations from Imported Samples

Impact of EPA Actions on Risk Driver Pesticide-Food Combinations from Imported Samples (Ranked by Percentage Change in Dietary Risk Index Levels from the Pre-FQPA Period)				
Commodity	**Pesticide**	**DRI Score**	**Year**	**Change in DRI Score**
Green Beans, Processed	Parathion methyl	0.0	2003	-100%
		200.6	1997	
Broccoli	Mevinphos	0.0	2002	-100%
		95.0	1994	
Grapes	Mevinphos	0.0	2001	-100%
		34.5	1994	
Apples	Chlorpyrifos	13.9	2002	-97%
		454.9	1996	
Tomatoes	Chlorpyrifos	68.8	2003	-85%
		451.8	1996	
Apple Juice	Dimethoate	11.1	1998	-83%
		65.0	1996	
Sweet Bell Peppers	Methamidophos	92.3	2003	-72%
		327.8	1999	
Winter Squash	Dieldrin	1.1	1999	-68%
		3.4	1997	
Cucumbers	Endosulfan I	15.0	2003	-55%
		33.5	1999	
Grapes	Dimethoate	21.6	2001	-38%
		35.1	1996	
Pears	Azinphos methyl	30.7	1999	-33%
		45.8	1997	
Cucumbers	Methamidophos	179.8	2003	-32%
		264.4	1999	
Green Beans, Processed	Methamidophos	27.6	2003	-10%
		30.5	1997	
Tomatoes	Methamidophos	44.1	2003	-8%
		48.0	1996	
Sweet Bell Peppers	Chlorpyrifos	586.6	2003	-2%
		595.6	1999	
Celery	Acephate	16.6	2002	8%
		15.4	1994	
Peaches	Dicofol p,p'	22.3	2002	18%
		18.9	1996	

Impact of EPA Actions on Risk Driver Pesticide-Food Combinations from Imported Samples

(Ranked by Percentage Change in Dietary Risk Index Levels from the Pre-FQPA Period)

Commodity	Pesticide	DRI Score	Year	Change in DRI Score
Celery	Methamidophos	104.3	2002	225%
		17.2	2001	
Pears	Dicofol p,p'	120.6	1999	323%
		28.5	1998	
Cantaloupe	Methamidophos	92.7	2000	409%
		18.2	1998	
Strawberries	Endosulfan I	71.3	1999	413%
		13.9	1998	
Potatoes	Chlorpropham	14.5	2002	1971%
		0.7	1995	
Peaches	Methamidophos	31.1	2002	10267 %
		0.3	1996	
Impact of EPA Actions	1039.7	**%**		
Parathions	200.6	19%		
Chlorpyrifos	824.0	79%		
Para+chlor	1024.6	99%		