

Table 1. Mean Dioxin Exposure from Beef, Based on Beef Consumption

	Beef consumption amount	Mean beef TEQ amount	Fat % in non-lean beef	Mean exposure, non-lean beef	Comparison of non-lean beef to the RfD*	Fat % in lean beef	Mean exposure, lean beef	Comparison of lean beef to the RfD*
Units	(g/kg-day)	(pg/g)		(pg/kg-bw-day)			(pg/kg-bw-day)	
	Value ¹	Value ²	Value ³	Calculation ⁴	Comparison ⁵	Value ³	Calculation ⁶	Comparison ⁵
Whole population	0.77	0.659	19.24%	0.098	0.139	6.16%	0.031	0.045
Birth to 1	0.34	0.659	19.24%	0.043	0.062	6.16%	0.014	0.020
1-2 years	1.38	0.659	19.24%	0.175	0.250	6.16%	0.056	0.080
3-5 years	1.42	0.659	19.24%	0.180	0.257	6.16%	0.058	0.082
6-12 years	1.11	0.659	19.24%	0.141	0.201	6.16%	0.045	0.064
13-19 years	0.83	0.659	19.24%	0.105	0.150	6.16%	0.034	0.048
20-49 years	0.73	0.659	19.24%	0.093	0.132	6.16%	0.030	0.042
Females 13-49	0.6	0.659	19.24%	0.076	0.109	6.16%	0.024	0.035
50 years and older	0.58	0.659	19.24%	0.074	0.105	6.16%	0.024	0.034

Footnotes:

1. 2011 EPA Exposure Factors Handbook, Table 11-5: <http://www.epa.gov/ncea/efh/report.html>

2. Mean TEQ amount is the mean sum-TEQ per pg/g of lipid

Dioxin 08 Survey: Dioxins and Dioxin-Like Compounds in the U.S. Domestic Meat and Poultry Supply: http://www.fsis.usda.gov/PDF/Dioxin_Report_1009.pdf

Huwe et al., J. Agric. Food Chem., 2009, 57, 11194–11200

3. 2011 EPA Exposure Factors Handbook, Table 11-38: <http://www.epa.gov/ncea/efh/report.html>

4. Mean exposure, non-lean beef = beef consumption amount x mean beef TEQ amount x fat % in non-lean beef

5. Comparison to RfD = mean exposure amount/RfD for dioxin

6. Mean exposure, lean beef = beef consumption amount x mean beef TEQ amount x fat % in lean beef

*EPA Dioxin Reassessment, Feb. 2012; RfD for dioxin = 0.7 pg/kg-bw-day (7×10^{-10} mg/kg-bw-day)

Table 2. Highest Dioxin Exposure from Beef, Based on Beef Consumption

	Beef consumption amount	Highest beef TEQ amount	Fat % in non-lean beef	Highest exposure, non-lean beef	Comparison of non-lean beef to the RfD*	Fat % in lean beef	Highest exposure, lean beef	Comparison of lean beef to the RfD*
Units	(g/kg-day)	(pg/g)		(pg/kg-bw-day)			(pg/kg-bw-day)	
	Value ¹	Value ²	Value ³	Calculation ⁴	Comparison ⁵	Value ³	Calculation ⁶	Comparison ⁵
Whole population	0.77	4.857	19.24%	0.720	1.028	6.16%	0.230	0.329
Birth to 1	0.34	4.857	19.24%	0.318	0.454	6.16%	0.102	0.145
1-2 years	1.38	4.857	19.24%	1.290	1.842	6.16%	0.413	0.590
3-5 years	1.42	4.857	19.24%	1.327	1.896	6.16%	0.425	0.607
6-12 years	1.11	4.857	19.24%	1.037	1.482	6.16%	0.332	0.474
13-19 years	0.83	4.857	19.24%	0.776	1.108	6.16%	0.248	0.355
20-49 years	0.73	4.857	19.24%	0.682	0.975	6.16%	0.218	0.312
Females 13-49	0.6	4.857	19.24%	0.561	0.801	6.16%	0.180	0.256
50 years and older	0.58	4.857	19.24%	0.542	0.774	6.16%	0.174	0.248

Footnotes:

1. 2011 EPA Exposure Factors Handbook, Table 11-5: <http://www.epa.gov/ncea/efh/report.html>

2. Highest TEQ amount is the highest-TEQ per pg/g of lipid

Dioxin 08 Survey: Dioxins and Dioxin-Like Compounds in the U.S. Domestic Meat and Poultry Supply: http://www.fsis.usda.gov/PDF/Dioxin_Report_1009.pdf

Huwe et al., J. Agric. Food Chem., 2009, 57, 11194–11200

3. 2011 EPA Exposure Factors Handbook, Table 11-38: <http://www.epa.gov/ncea/efh/report.html>

4. Highest exposure, non-lean beef = beef consumption amount x highest beef TEQ amount x fat % in non-lean beef

5. Comparison to RfD = highest exposure amount/RfD for dioxin

6. Highest exposure, lean beef = beef consumption amount x highest beef TEQ amount x fat % in lean beef

*EPA Dioxin Reassessment, Feb. 2012; RfD for dioxin = 0.7 pg/kg-bw-day (7×10^{-10} mg/kg-bw-day)

Table 3. Dioxin Exposure from Beef as One of Several Protein Foods Sources
Mean Recommended Calorie Level and Mean TEQ
Based on USDA Food Pattern Recommendations in the 2010 Dietary Guidelines

	Mean calorie level	Recommended protein foods amount	Recommended meat, poultry, egg amount	Meat % of meat, poultry, egg amount	Recommended meat amount	Beef % of meat	Recommended beef amount	Recommended beef amount	Body weight (bw)	Consumption amount	Mean beef TEQ amount	Fat % in lean beef	Exposure based on recommended amount	Comparison of exposure to RfD*
Unit		(oz/day)	(oz/day)		(oz/day)		(oz/day)	(g/day)	(kg)	(g/kg-day)	(pg/g)		(pg/kg-bw-day)	
	Value ¹	Value ¹	Value ²	Value ³	Calculation ⁴	Value ⁵	Calculation ⁶	Conversion ⁷	Value ⁸	Calculation ⁹	Value ¹⁰	Value ¹¹	Calculation ¹²	Comparison ¹³
1-2 years	1000	2.0	1.4	49.05%	0.7	67%	0.47	13.310	11.4	1.17	0.659	6.16%	0.047	0.068
3-5 years	1400	4.0	2.7	49.05%	1.3	67%	0.89	25.288	18.6	1.36	0.659	6.16%	0.055	0.079
6-12 years	1800	5.0	3.4	49.05%	1.7	67%	1.13	31.943	31.8	1.00	0.659	6.16%	0.041	0.058
13-19 years	2600	6.5	4.4	49.05%	2.2	67%	1.46	41.260	71.6	0.58	0.659	6.16%	0.023	0.033
20-49 years	2600	6.5	4.4	49.05%	2.2	67%	1.46	41.260	80	0.52	0.659	6.16%	0.021	0.030
Females 13-49	1800	5.0	3.4	49.05%	1.7	67%	1.13	31.943	70^	0.46	0.659	6.16%	0.019	0.026
50 years and older	2000	5.5	3.7	49.05%	1.8	67%	1.22	34.605	80	0.43	0.659	6.16%	0.018	0.025
Usual U.S. intake (adults)	2000	5.5	N/A	N/A	2.5~	67%	1.68	47.486	80	0.594	0.659	6.16%	0.024	0.034
Recommended U.S. intake	2000	5.5	N/A	N/A	1.8~	67%	1.21	34.190	80	0.427	0.659	6.16%	0.017	0.025

Footnotes:

1. Based on recommended calorie levels and Protein Foods amounts from Dietary Guidelines for Americans, 2010, Appendices 6&7: <http://www.cnpp.usda.gov/DGAs2010-PolicyDocument.htm>
2. Based on recommended meat, poultry, egg amounts from Dietary Guidelines for Americans, 2010, Appendix 7: <http://www.cnpp.usda.gov/DGAs2010-PolicyDocument.htm>
For example, for a 1000 calorie diet, a value of 10 oz/wk is divided by 7 days/wk
3. Personal communication with CNPP (USDA Center for Nutrition Policy and Promotion); based on the USDA Food Patterns: <http://www.cnpp.usda.gov/USDAFoodPatterns.htm>
4. Recommended meat amount = meat % of meat, poultry and egg amount x recommended meat, poultry and egg amount
~Usual and recommended U.S. intake for meat portion of protein foods amount is taken from Table 5-1, and represents a 2000 calorie diet
5. Beef % of "Meats Subgroup" is 67 %: the sum of beef, ground beef, beef liver and beef luncheon meats
USDA Food Patterns: <http://www.cnpp.usda.gov/Publications/USDAFoodPatterns/ItemClustersAndRepFoods.pdf>
6. Recommended beef amount = recommended meat amount x beef % of meat
7. Conversion from ounces to grams = oz x 28.35 g/oz
8. 2011 EPA Exposure Factors Handbook, Table 8-1: <http://www.epa.gov/ncea/efh/report.html>
^"Females 13-49" body weight is an average taken from Table 8-5
9. Consumption amount = recommended beef amount/body weight
10. Mean TEQ amount is the mean sum-TEQ per pg/g of lipid
Dioxin 08 Survey: Dioxins and Dioxin-Like Compounds in the U.S. Domestic Meat and Poultry Supply: http://www.fsis.usda.gov/PDF/Dioxin_Report_1009.pdf
Huwe et al., J. Agric. Food Chem., 2009, 57, 11194-11200
11. 2011 EPA Exposure Factors Handbook, Table 11-38: <http://www.epa.gov/ncea/efh/report.html>
12. Exposure = consumption amount x mean beef TEQ amount x fat % in lean beef
13. Comparison of exposure to the RfD = exposure/RfD for dioxin
*EPA Dioxin Reassessment, Feb. 2012; RfD for dioxin = 0.7 pg/kg-bw-day (7 X 10⁻¹⁰ mg/kg-bw-day)

**Table 4. Dioxin Exposure from Beef as One of Several Protein Foods Sources
Mean Recommended Calorie Level and Highest TEQ
Based on USDA Food Pattern Recommendations in the 2010 Dietary Guidelines**

	Mean calorie level	Recommended protein foods amount	Recommended meat, poultry, egg amount	Meat % of meat, poultry, egg amount	Recommended meat amount	Beef % of meat	Recommended beef amount	Recommended beef amount	Body weight (bw)	Consumption amount	Highest beef TEQ amount	Fat % in lean beef	Exposure based on recommended amount	Comparison of exposure to RfD*
Unit		(oz/day)	(oz/day)		(oz/day)		(oz/day)	(g/day)	(kg)	(g/kg-day)	(pg/g)		(pg/kg-bw-day)	
	Value ¹	Value ¹	Value ²	Value ³	Calculation ⁴	Value ⁵	Calculation ⁶	Conversion ⁷	Value ⁸	Calculation ⁹	Value ¹⁰	Value ¹¹	Calculation ¹²	Comparison ¹³
1-2 years	1000	2.0	1.4	49.05%	0.7	67%	0.47	13.310	11.4	1.17	4.857	6.16%	0.349	0.499
3-5 years	1400	4.0	2.7	49.05%	1.3	67%	0.89	25.288	18.6	1.36	4.857	6.16%	0.407	0.581
6-12 years	1800	5.0	3.4	49.05%	1.7	67%	1.13	31.943	31.8	1.00	4.857	6.16%	0.301	0.429
13-19 years	2600	6.5	4.4	49.05%	2.2	67%	1.46	41.260	71.6	0.58	4.857	6.16%	0.172	0.246
20-49 years	2600	6.5	4.4	49.05%	2.2	67%	1.46	41.260	80	0.52	4.857	6.16%	0.154	0.220
Females 13-49	1800	5.0	3.4	49.05%	1.7	67%	1.13	31.943	70^	0.46	4.857	6.16%	0.137	0.195
50 years and older	2000	5.5	3.7	49.05%	1.8	67%	1.22	34.605	80	0.43	4.857	6.16%	0.129	0.185
Usual U.S. intake (adults)	2000	5.5	N/A	N/A	2.5~	67%	1.68	47.486	80	0.594	4.857	6.16%	0.178	0.254
Recommended U.S. intake	2000	5.5	N/A	N/A	1.8~	67%	1.21	34.190	80	0.427	4.857	6.16%	0.128	0.183

Footnotes:

1. Based on recommended calorie levels and Protein Foods amounts from Dietary Guidelines for Americans, 2010, Appendices 6&7: <http://www.cnpp.usda.gov/DGAs2010-PolicyDocument.htm>
2. Based on recommended meat, poultry, egg amounts from Dietary Guidelines for Americans, 2010, Appendix 7: <http://www.cnpp.usda.gov/DGAs2010-PolicyDocument.htm>
For example, for a 1000 calorie diet, a value of 10 oz/wk is divided by 7 days/wk
3. Personal communication with CNPP (USDA Center for Nutrition Policy and Promotion); based on the USDA Food Patterns: <http://www.cnpp.usda.gov/USDAFoodPatterns.htm>
4. Recommended meat amount = meat % of meat, poultry and egg amount x recommended meat, poultry and egg amount
~Usual and recommended U.S. intake for meat portion of protein foods amount is taken from Table 5-1, and represents a 2000 calorie diet
5. Beef % of "Meats Subgroup" is 67 %: the sum of beef, ground beef, beef liver and beef luncheon meats
USDA Food Patterns: <http://www.cnpp.usda.gov/Publications/USDAFoodPatterns/ItemClustersAndRepFoods.pdf>
6. Recommended beef amount = recommended meat amount x beef % of meat
7. Conversion from ounces to grams = oz x 28.35 g/oz
8. 2011 EPA Exposure Factors Handbook, Table 8-1: <http://www.epa.gov/ncea/efh/report.html>
^"Females 13-49" body weight is an average taken from Table 8-5
9. Consumption amount = recommended beef amount/body weight
10. Highest TEQ amount is the highest-TEQ per pg/g of lipid
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Huwe et al., J. Agric. Food Chem., 2009, 57, 11194-11200
11. 2011 EPA Exposure Factors Handbook, Table 11-38: <http://www.epa.gov/ncea/efh/report.html>
12. Exposure = consumption amount x highest beef TEQ amount x fat % in lean beef
13. Comparison of exposure to the RfD = exposure/RfD for dioxin
*EPA Dioxin Reassessment, Feb. 2012; RfD for dioxin = 0.7 pg/kg-bw-day (7 X 10⁻¹⁰ mg/kg-bw-day)

**Table 5. Dioxin Exposure from Beef as One of Several Protein Foods Sources
Highest Recommended Calorie Level and Mean TEQ
Based on USDA Food Pattern Recommendations in the 2010 Dietary Guidelines**

Unit	Highest calorie level	Recommended protein foods amount	Recommended meat, poultry, egg amount	Meat % of meat, poultry, egg amount	Recommended meat amount	Beef % of meat	Recommended beef amount	Recommended beef amount	Body weight (bw)	Consumption amount	Mean beef TEQ amount	Fat % in lean beef	Exposure based on recommended amount	Comparison of exposure to RfD*
	Value ¹	Value ¹	Value ²	Value ³	Calculation ⁴	Value ⁵	Calculation ⁶	Conversion ⁷	Value ⁸	Calculation ⁹	Value ¹⁰	Value ¹¹	Calculation ¹²	Comparison ¹³
		(oz/day)	(oz/day)		(oz/day)		(oz/day)	(g/day)	(kg)	(g/kg-day)	(pg/g)		(pg/kg-bw-day)	
Children 1-2 years	1000	2.0	1.4	49.05%	0.7	67%	0.47	13.310	11.4	1.17	0.659	6.16%	0.047	0.068
Females 3-5 years	1600	5.0	3.4	49.05%	1.7	67%	1.13	31.943	18.3	1.75	0.659	6.16%	0.071	0.101
Males 3-5 years	1600	5.0	3.4	49.05%	1.7	67%	1.13	31.943	18.8	1.70	0.659	6.16%	0.069	0.099
Females 6-12 years	2200	6.0	4.1	49.05%	2.0	67%	1.36	38.598	31.7	1.22	0.659	6.16%	0.049	0.071
Males 6-12 years	2400	6.5	4.4	49.05%	2.2	67%	1.46	41.260	31.9	1.29	0.659	6.16%	0.053	0.075
Females 13-19 years	2400	6.5	4.4	49.05%	2.2	67%	1.46	41.260	65.9	0.63	0.659	6.16%	0.025	0.036
Males 13-19 years	3200	7.0	4.9	49.05%	2.4	67%	1.60	45.253	77.3	0.59	0.659	6.16%	0.024	0.034
Females 20-49 years	2400	6.5	4.4	49.05%	2.2	67%	1.46	41.260	77.1	0.54	0.659	6.16%	0.022	0.031
Males 20-49 years	3000	7.0	4.9	49.05%	2.4	67%	1.60	45.253	90.5	0.50	0.659	6.16%	0.020	0.029
Females 50 years and older	2200	6.0	4.1	49.05%	2.0	67%	1.36	38.598	77.5	0.50	0.659	6.16%	0.020	0.029
Males 50 years and older	2800	7.0	4.9	49.05%	2.4	67%	1.60	45.253	89.5	0.51	0.659	6.16%	0.021	0.029
Usual U.S. intake (adults)	2000	5.5	N/A	N/A	2.5~	67%	1.68	47.486	80	0.594	0.659	6.16%	0.024	0.034
Recommended U.S. intake	2000	5.5	N/A	N/A	1.8~	67%	1.21	34.190	80	0.427	0.659	6.16%	0.017	0.025

Footnotes:

1. Based on recommended calorie levels and Protein Foods amounts from Dietary Guidelines for Americans, 2010, Appendices 6&7: <http://www.cnpp.usda.gov/DGAs2010-PolicyDocument.htm>

2. Based on recommended meat, poultry, egg amounts from Dietary Guidelines for Americans, 2010, Appendix 7: <http://www.cnpp.usda.gov/DGAs2010-PolicyDocument.htm>

For example, for a 1000 calorie diet, a value of 10 oz/wk is divided by 7 days/wk

3. Personal communication with CNPP (USDA Center for Nutrition Policy and Promotion); based on the USDA Food Patterns: <http://www.cnpp.usda.gov/USDAFoodPatterns.htm>

4. Recommended meat amount = meat % of meat, poultry and egg amount x recommended meat, poultry and egg amount

~Usual and recommended U.S. intake for meat portion of protein foods amount is taken from Table 5-1, and represents a 2000 calorie diet

5. Beef % of "Meats Subgroup" is 67 %: the sum of beef, ground beef, beef liver and beef luncheon meats

USDA Food Patterns: <http://www.cnpp.usda.gov/Publications/USDAFoodPatterns/ItemClustersAndRepFoods.pdf>

6. Recommended beef amount = recommended meat amount x beef % of meat

7. Conversion from ounces to grams = oz x 28.35 g/oz

8. 2011 EPA Exposure Factors Handbook, Tables 8-3, 8-4, 8-5: <http://www.epa.gov/ncea/efh/report.html>

9. Consumption amount = recommended beef amount/body weight

10. Mean TEQ amount is the mean sum-TEQ per pg/g of lipid

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Huwe et al., J. Agric. Food Chem., 2009, 57, 11194–11200

11. 2011 EPA Exposure Factors Handbook, Table 11-38: <http://www.epa.gov/ncea/efh/report.html>

12. Exposure = consumption amount x mean beef TEQ amount x fat % in lean beef

13. Comparison of exposure to the RfD = exposure/RfD for dioxin

*EPA Dioxin Reassessment, Feb. 2012; RfD for dioxin = 0.7 pg/kg-bw-day (7 X 10⁻¹⁰ mg/kg-bw-day)

**Table 6. Dioxin Exposure from Beef as One of Several Protein Foods Sources
Highest Recommended Calorie Level and Highest TEQ
Based on USDA Food Pattern Recommendations in the 2010 Dietary Guidelines**

Unit	Highest calorie level	Recommended protein foods amount (oz/day)	Recommended meat, poultry, egg amount (oz/day)	Meat % of meat, poultry, egg amount	Recommended meat amount (oz/day)	Beef % of meat	Recommended beef amount (oz/day)	Recommended beef amount (g/day)	Body weight (bw) (kg)	Consumption amount (g/kg-day)	Highest beef TEQ amount (pg/g)	Fat % in lean beef	Exposure based on recommended amount (pg/kg-bw-day)	Comparison of exposure to RfD*
	Value ¹	Value ¹	Value ²	Value ³	Calculation ⁴	Value ⁵	Calculation ⁶	Conversion ⁷	Value ⁸	Calculation ⁹	Value ¹⁰	Value ¹¹	Calculation ¹²	Comparison ¹³
Children 1-2 years	1000	2.0	1.4	49.05%	0.7	67%	0.47	13.310	11.4	1.17	4.857	6.16%	0.349	0.499
Females 3-5 years	1600	5.0	3.4	49.05%	1.7	67%	1.13	31.943	18.3	1.75	4.857	6.16%	0.522	0.746
Males 3-5 years	1600	5.0	3.4	49.05%	1.7	67%	1.13	31.943	18.8	1.70	4.857	6.16%	0.508	0.726
Females 6-12 years	2200	6.0	4.1	49.05%	2.0	67%	1.36	38.598	31.7	1.22	4.857	6.16%	0.364	0.520
Males 6-12 years	2400	6.5	4.4	49.05%	2.2	67%	1.46	41.260	31.9	1.29	4.857	6.16%	0.387	0.553
Females 13-19 years	2400	6.5	4.4	49.05%	2.2	67%	1.46	41.260	65.9	0.63	4.857	6.16%	0.187	0.268
Males 13-19 years	3200	7.0	4.9	49.05%	2.4	67%	1.60	45.253	77.3	0.59	4.857	6.16%	0.175	0.250
Females 20-49 years	2400	6.5	4.4	49.05%	2.2	67%	1.46	41.260	77.1	0.54	4.857	6.16%	0.160	0.229
Males 20-49 years	3000	7.0	4.9	49.05%	2.4	67%	1.60	45.253	90.5	0.50	4.857	6.16%	0.150	0.214
Females 50 years and older	2200	6.0	4.1	49.05%	2.0	67%	1.36	38.598	77.5	0.50	4.857	6.16%	0.149	0.213
Males 50 years and older	2800	7.0	4.9	49.05%	2.4	67%	1.60	45.253	89.5	0.51	4.857	6.16%	0.151	0.216
Usual U.S. intake (adults)	2000	5.5	N/A	N/A	2.5~	67%	1.68	47.486	80	0.594	4.857	6.16%	0.178	0.254
Recommended U.S. intake	2000	5.5	N/A	N/A	1.8~	67%	1.21	34.190	80	0.427	4.857	6.16%	0.128	0.183

Footnotes:

- Based on recommended calorie levels and Protein Foods amounts from Dietary Guidelines for Americans, 2010, Appendices 6&7: <http://www.cnpp.usda.gov/DGAs2010-PolicyDocument.htm>
- Based on recommended meat, poultry, egg amounts from Dietary Guidelines for Americans, 2010, Appendix 7: <http://www.cnpp.usda.gov/DGAs2010-PolicyDocument.htm>
For example, for a 1000 calorie diet, a value of 10 oz/wk is divided by 7 days/wk
- Personal communication with CNPP (USDA Center for Nutrition Policy and Promotion); based on the USDA Food Patterns: <http://www.cnpp.usda.gov/USDAFoodPatterns.htm>
- Recommended meat amount = meat % of meat, poultry and egg amount x recommended meat, poultry and egg amount
~Usual and recommended U.S. intake for meat portion of protein foods amount is taken from Table 5-1, and represents a 2000 calorie diet
- Beef % of "Meats Subgroup" is 67 %: the sum of beef, ground beef, beef liver and beef luncheon meats
USDA Food Patterns: <http://www.cnpp.usda.gov/Publications/USDAFoodPatterns/ItemClustersAndRepFoods.pdf>
- Recommended beef amount = recommended meat amount x beef % of meat
- Conversion from ounces to grams = oz x 28.35 g/oz
- 2011 EPA Exposure Factors Handbook, Tables 8-3, 8-4, 8-5: <http://www.epa.gov/ncea/efh/report.html>
- Consumption amount = recommended beef amount/body weight
- Highest TEQ amount is the highest-TEQ per pg/g of lipid
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Huwe et al., J. Agric. Food Chem., 2009, 57, 11194–11200
- 2011 EPA Exposure Factors Handbook, Table 11-38: <http://www.epa.gov/ncea/efh/report.html>
- Exposure = consumption amount x highest beef TEQ amount x fat % in lean beef
- Comparison of exposure to the RfD = exposure/RfD for dioxin
*EPA Dioxin Reassessment, Feb. 2012; RfD for dioxin = 0.7 pg/kg-bw-day (7 X 10⁻¹⁰ mg/kg-bw-day)

**Table 7. Mean Dioxin Exposure from Beef as the Sole Protein Food Consumed
Based on USDA Food Pattern Recommended Intakes of all Protein Foods in the 2010 Dietary Guidelines**

	Recommended protein foods amount	Recommended protein foods amount	Body weight (bw)	Consumption amount	Mean beef TEQ amount	Fat % in lean beef	Exposure based on recommended amount	Comparison of exposure to RfD*
Unit	(oz/day)	(g/day)	(kg)	(g/kg-day)	(pg/g)		(pg/kg-bw-day)	
	Value ¹	Conversion ²	Value ³	Calculation ⁴	Value ⁵	Value ⁶	Calculation ⁷	Comparison ⁸
1-2 years	2.0	56.700	11.4	4.97	0.659	6.16%	0.202	0.288
3-5 years	4.0	113.400	18.6	6.10	0.659	6.16%	0.247	0.354
6-12 years	5.0	141.750	31.8	4.46	0.659	6.16%	0.181	0.259
13-19 years	6.5	184.275	71.6	2.57	0.659	6.16%	0.104	0.149
20-49 years	6.5	184.275	80	2.30	0.659	6.16%	0.094	0.134
Females 13-49	5.0	141.750	70^	2.03	0.659	6.16%	0.082	0.117
50 years and older	5.5	155.925	80	1.95	0.659	6.16%	0.079	0.113

Footnotes:

1. Based on recommended calorie levels and Protein Foods amounts from Dietary Guidelines for Americans, 2010, Appendices 6&7: <http://www.cnpp.usda.gov/DGAs2010-PolicyDocument.htm>

2. Conversion from ounces to grams = oz x 28.35 g/oz

3. 2011 EPA Exposure Factors Handbook, Table 8-1: <http://www.epa.gov/ncea/efh/report.html>

^"Females 13-49" body weight is an average taken from Table 8-5

4. Consumption amount = recommended Protein Foods amount/body weight

5. Mean TEQ amount is the mean sum-TEQ per pg/g of lipid

Dioxin 08 Survey: Dioxins and Dioxin-Like Compounds in the U.S. Domestic Meat and Poultry Supply: http://www.fsis.usda.gov/PDF/Dioxin_Report_1009.pdf

Huwe et al., J. Agric. Food Chem., 2009, 57, 11194–11200

6. 2011 EPA Exposure Factors Handbook, Table 11-38: <http://www.epa.gov/ncea/efh/report.html>

7. Exposure = consumption amount x mean beef TEQ amount x fat % in lean beef

8. Comparison of exposure to the RfD = exposure/RfD for dioxin

*EPA Dioxin Reassessment, Feb. 2012; RfD for dioxin = 0.7 pg/kg-bw-day (7 X 10⁻¹⁰ mg/kg-bw-day)