

11. Intake of Meats, Dairy Products, and Fats

11.1 Introduction

Meats, dairy products, and fats may become contaminated with toxic chemicals by several pathways. These food sources can become contaminated if animals are exposed to contaminated media (i.e., soil, water, or feed crops). To assess exposure through this pathway, information on meat, dairy, and fat ingestion rates is needed. Chapter 11 of the *Exposure Factors Handbook* provides information and recommendations on ingestion rates for meats, dairy products, and fats. These data are highlighted in this document.

11.2 Recommended Exposure Factors

The recommended ingestion rates for total meat, dairy, and fats are presented in Table 11-1. The data for meats and dairy products are based on the U.S. EPA analyses of NHANES 2003-2006 data. The data for fats are based on the U.S. EPA analysis of data from the 1994-1996/1998 Continuing Survey of Food Intakes by Individuals (CSFII) (U.S. EPA, 2007). NHANES and CSFII collected 24-hour dietary intake data via interviews conducted on 2 non-consecutive days. U.S. EPA converted intake data on the foods people reported eating to the quantities of agricultural commodities eaten (e.g., beef stew may contain the commodities beef, potatoes, carrots, and other vegetables), and estimated intake rates for meats, dairy products, and fats. Both consumer-only and per capita intake recommendations are given in Table 11-1. Consumer-only intake is defined as the quantity of meats, dairy products, or fats consumed by individuals during the survey period averaged across only the individuals who consumed these food items during the survey period. Per capita intake rates are generated by averaging consumer-only intakes over the entire population. The U.S. EPA analysis of NHANES data was conducted using childhood age groups that differed slightly from U.S. EPA's *Guidance on Selecting Age Groups for Monitoring and Assessing Childhood Exposures to Environmental Contaminants* (U.S. EPA, 2005). However, for the purposes of the recommendations presented here, childhood data were placed in the standardized age categories closest to those used in the analysis. Overall confidence in the values for intake of meats, dairy products, and fats is medium-high for the averages and low for the long-term upper percentiles.



For more information about the key studies used to derive the recommended values for meat, dairy product, and fat intake, refer to **Chapter 11 of the *Exposure Factors Handbook*** at <http://www.epa.gov/ncea/efh/pdfs/efh-chapter11.pdf>. Detailed information on studies of meat and dairy product intake is provided in Section 11.3, and information on studies of fat intake is found in Section 11.4. For more information on the consumption of specific meats, dairy products, and fats, refer to Chapter 11 of the *Exposure Factors Handbook*. Information on the conversion between wet-weight and dry-weight intake rates is provided in Section 11.5, and information on the conversion between wet-weight and lipid-weight intake rates is provided in Section 11.6.

Table 11-1. Recommended Values for Intake of Meats, Dairy Products, and Fats, Edible Portion, Uncooked

Age Group	Per Capita		Consumers Only	
	Mean	95 th Percentile	Mean	95 th Percentile
	g/kg-day	g/kg-day	g/kg-day	g/kg-day
Total Meats^{a, b, c}				
Birth to 1 year	1.2	5.4 ^d	2.7	8.1 ^d
1 to <2 years	4.0	10.0 ^d	4.1	10.1 ^d
2 to <3 years	4.0	10.0 ^d	4.1	10.1 ^d
3 to <6 years	3.9	8.5	3.9	8.6
6 to <11 years	2.8	6.4	2.8	6.4
11 to <16 years	2.0	4.7	2.0	4.7
16 to <21 years	2.0	4.7	2.0	4.7
21 to <50 years	1.8	4.1	1.8	4.1
≥50 years	1.4	3.1	1.4	3.1
Total Dairy Products^{a, b, c}				
Birth to 1 year	10.1	43.2 ^d	11.7	44.7 ^d
1 to <2 years	43.2	94.7 ^d	43.2	94.7 ^d
2 to <3 years	43.2	94.7 ^d	43.2	94.7 ^d
3 to <6 years	24.0	51.1	24.0	51.1
6 to <11 years	12.9	31.8	12.9	31.8
11 to <16 years	5.5	16.4	5.5	16.4
16 to <21 years	5.5	16.4	5.5	16.4
21 to <50 years	3.5	10.3	3.5	10.3
≥50 years	3.3	9.6	3.3	9.6
Individual Meat and Dairy Products—See Tables 11-5 and 11-6 in the Exposure Factors Handbook				
Total Fats^{e, f}				
Birth to <1 month	5.2	16	7.8	16
1 to <3 months	4.5	12	6.0	12
3 to <6 months	4.1	8.2	4.4	8.3
6 to <12 months	3.7	7.0	3.7	7.0
1 to <2 years	4.0	7.1	4.0	7.1
2 to <3 years	3.6	6.4	3.6	6.4
3 to <6 years	3.4	5.8	3.4	5.8
6 to <11 years	2.6	4.2	2.6	4.2
11 to <16 years	1.6	3.0	1.6	3.0
16 to <21 years	1.3	2.7	1.3	2.7
21 to <31 years	1.2	2.3	1.2	2.3
31 to <41 years	1.1	2.1	1.1	2.1
41 to <51 years	1.0	1.9	1.0	1.9
51 to <61 years	0.9	1.7	0.9	1.7
61 to < 71 years	0.9	1.7	0.9	1.7
71 to <81 years	0.8	1.5	0.8	1.5
≥81 years	0.9	1.5	0.9	1.5

^a Analysis was conducted using slightly different childhood age groups than those recommended in *Guidance on Selecting Age Groups for Monitoring and Assessing Childhood Exposures to Environmental Contaminants* (U.S. EPA, 2005). Data were placed in the standardized age categories closest to those used in the analysis.

^b For multiple percentiles, see Tables 11-3 and 11-4 in the *Exposure Factors Handbook*.

^c Source: U.S. EPA analysis of NHANES 2003-2006 data.

^d Estimates are less statistically reliable based on guidance published in the *Joint Policy on Variance Estimation and Statistical Reporting Standards on NHANES III and CSFII Reports: NHIS/NCHS Analytical Working Group Recommendations* (NCHS, 1993).

^e For multiple percentiles, see Tables 11-31 and 11-33 in the *Exposure Factors Handbook*.

^f Source: U.S. EPA, 2007.