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WHAT WE EAT IN AMERICA, NHANES 2001-2002:

USUAL NUTRIENT INTAKES FROM FOOD

COMPARED TO DIETARY REFERENCE INTAKES

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Abstract

This report presents national estimates of usual nutrient intake distributions from food for 24 nutrients and dietary components and compares those estimates to the Dietary Reference Intakes published by the Institute of Medicine. Data are based on 8,940 individuals ages 1 year and older (excluding breast-fed children and pregnant or lactating females) who completed a 24-hour dietary recall in *What We Eat in America*, the dietary interview component of the National Health and Nutrition Examination Survey, 2001-2002. Data include nutrient intakes from food only and do not cover intakes from dietary supplements or over-the-counter medicines. Statistics are reported for 17 gender/age groups. Nutrients identified as potential problems for most gender/age groups based on comparisons to Estimated Average Requirements include vitamins A, E, and C, and magnesium. Other nutrients that may be problems only for certain segments of the population are vitamin B_6 for older adult females, zinc for older adult males and females and teenage females, and phosphorus for preteen and teenage females. Vitamin K, calcium, potassium, and dietary fiber, nutrients for which no Estimated Average Requirements have been established, may also be of concern. Most Americans had adequate intakes of carbohydrate, selenium, niacin, and riboflavin. In addition, children and males generally had adequate intakes of folate, copper, phosphorus, thiamin, iron, and protein. Proportions of females with adequate intakes of these nutrients were lower.

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ARS Mission

The Agricultural Research Service conducts research to develop and transfer solutions to agricultural problems of high national priority and provides information access and dissemination to ensure high-quality, safe food and other agricultural products; assess the nutritional needs of Americans; sustain a competitive agricultural economy; and enhance the natural resource base and the environment; and provide economic opportunities for rural citizens, communities, and society as a whole.

Use of Dietary Reference Intakes for Nutrient Assessment of Groups

The Food and Nutrition Board of the Institute of Medicine, National Academies, established a set of reference values for nutrients called Dietary Reference Intakes (DRIs) for use in planning and assessing diets of apparently healthy people (1-7). The DRIs used in this report are those appropriate for assessing intakes of population groups, and include the Estimated Average Requirement (EAR), Adequate Intake (AI) for those nutrients without an EAR, and Tolerable Upper Intake Level (UL). **The assessments presented in this report cover nutrient intakes from foods only.** They do not cover intake from dietary supplements or over-the-counter medicines.

The data in this report are estimated from 24-hour dietary recall interviews conducted in ***What We Eat in America*** **(WWEIA)**, NHANES 2001-2002 (8). Dietary recalls were conducted by trained interviewers using automated data collection systems that included multiple passes. The day 1 recalls were conducted in-person in the NHANES Mobile Examination Center. The day 2 recalls were conducted by telephone approximately 3-10 days after the day 1 recall. The intake information was coded using the USDA Food and Nutrient Database for Dietary Studies 1.0 to produce nutrient intake values (9).

This report presents estimates of usual nutrient intakes, including the mean, standard error of the mean, and intakes at the 5^{th}, 10^{th}, 25^{th}, 50^{th}, 75^{th}, 90^{th}, and 95^{th} percentiles for gender/age groups for which DRIs have been established: children ages 1-3 and 4-8 years, males and females ages 9-13, 14-18, 19-30, 31-50, 51-70, and over 70 years. Additionally, summary estimates are presented for males and for females 19 years and older, and all individuals. Infants and pregnant and lactating females were excluded because of sample sizes that were not large enough for comparison to their unique DRIs. Breast-fed children were excluded because breast milk was not quantified in their dietary intakes. Sample sizes for all gender/age groups from WWEIA, NHANES 2001-2002 are provided in Appendix A.

The data are presented in tables grouped into three sections defined by the DRI reference value used to assess the nutrient intake. Section A includes usual intake estimates for nutrients for which an EAR has been established, Section B includes usual intake estimates for nutrients for which an AI has been established, and Section C includes estimates of the proportion of the population with usual intakes from food greater than the UL.

Section A. *Usual Nutrient Intakes from Food, 2001-2002, Compared to Estimated Average Requirements.*

This section presents estimated usual daily intakes for those nutrients for which an EAR has been established and for which food composition data are available: vitamin A, vitamin E, thiamin, riboflavin, niacin, vitamin B_6, folate, vitamin B_{12}, vitamin C, phosphorus, magnesium, iron, zinc, copper, selenium, carbohydrate, and protein. It also presents percentages of individuals with intakes **less than the EAR** as estimates of the prevalence of inadequacy. The EAR is the average daily nutrient intake level estimated to meet the requirement of half of the healthy individuals in a particular life stage and gender group. It is used to estimate the prevalence of inadequate intakes in a population group.

For all nutrients except iron, the EAR cut-point method was used to determine the prevalence of inadequacy (7). For iron, one of the assumptions required for use of the cut-point method was not met. Because the distribution of requirements for some of the gender/age groups is not symmetrical, the probability approach was used to determine the prevalence of inadequate iron intake (4,7).

Section B. *Usual Nutrient Intakes from Food, 2001-2002, Compared to Adequate Intakes.*

This section presents estimated usual daily intakes for those nutrients for which an AI has been established and for which food composition data are available: vitamin K, calcium, potassium, sodium, dietary fiber, linoleic acid, and linolenic acid. The Institute of Medicine establishes an AI for nutrients when insufficient data are available for setting an EAR. The AI is the recommended average daily intake level based on observed or experimentally determined approximations or estimates of nutrient intake by a group (or groups) of apparently healthy people that are assumed to be adequate. This definition is conceptually different from that for an EAR. Mean usual intake at or greater than the AI implies a low prevalence of inadequate intakes, especially when the AI is based on the mean intake of a healthy group. Unlike an EAR, an AI cannot be used to estimate the prevalence of inadequacy in a population. This report presents the percentages of individuals with intakes **at or greater than the AI** (not less than the AI), but this percentage should not be interpreted as a prevalence of "adequacy". If at least 50% of the gender/age group has intakes greater than the AI, then the prevalence of inadequacy should be low. If less than 50% have intakes greater than the AI, then no assumption about the prevalence of inadequacy can be made.

Section C. *Proportion of Population with Usual Nutrient Intakes from Food, 2001-2002, Greater Than Tolerable Upper Intake Levels (UL).*

This section presents estimates of the proportion of the population with usual intakes from food greater than the ULs for nutrients for which ULs have been established and appropriate food composition data are available: vitamin A, vitamin B_6, folate, vitamin C, calcium, phosphorus, iron, zinc, copper, selenium, and sodium. The UL is the maximum level of daily nutrient intake that is likely to

pose no risk of adverse health effects for almost all individuals in the general population. As intake increases above the UL, the potential risk of adverse effects may increase.

- For most nutrients, the UL is based on the contribution from food, dietary supplements, and water. However, the tables cover intake from food only.
- For vitamin A and folate, the UL applies to certain forms of the nutrient: preformed vitamin A (retinol) and folic acid (the synthetic form of folate found in fortified foods and in dietary supplements) (2,4). The tables cover intake of these forms from food only.
- For some nutrients, including niacin, magnesium, and vitamin E, the UL applies to intake from dietary supplements and over-the-counter medicines, but not intake from food (1-3). Those nutrients are not included in these tables.

It is important to note that the proportions of the population with intakes greater than the ULs, as shown in these tables, may be underestimated because they do not include nutrient intakes from dietary supplements or water which were not available when these analyses were done.

Method for Estimating Usual Intakes

Usual intakes were computed for this report based on the recommendation of the Institute of Medicine regarding the need to determine the distributions of usual nutrient intakes for assessing diets of population groups in relation to the DRIs (10). Nutrient intakes for an individual vary from day-to-day. This variation is referred to as within-individual variation. To determine usual nutrient intake for an individual, a large number of days of intake data is typically needed. It is seldom practical to collect long-term data for each person in a large group such as the sample from ***WWEIA***, NHANES. Therefore, a statistical modeling method that accounts for within-individual variation in nutrient intakes while requiring relatively few days of intake per sampled individual was needed. The statistical method used for estimating usual intake distributions and the proportion below or above defined cutoff values was developed at Iowa State University (10, 11). The software program used to carry out the method was Software for Intake Distribution Estimation (C-SIDE) (12).

The usual intake estimation procedure requires a minimum of two 24-hour dietary recalls for at least a representative sample of the individuals in the group in order to separate the total variability in intakes into within- and between-individual components. While

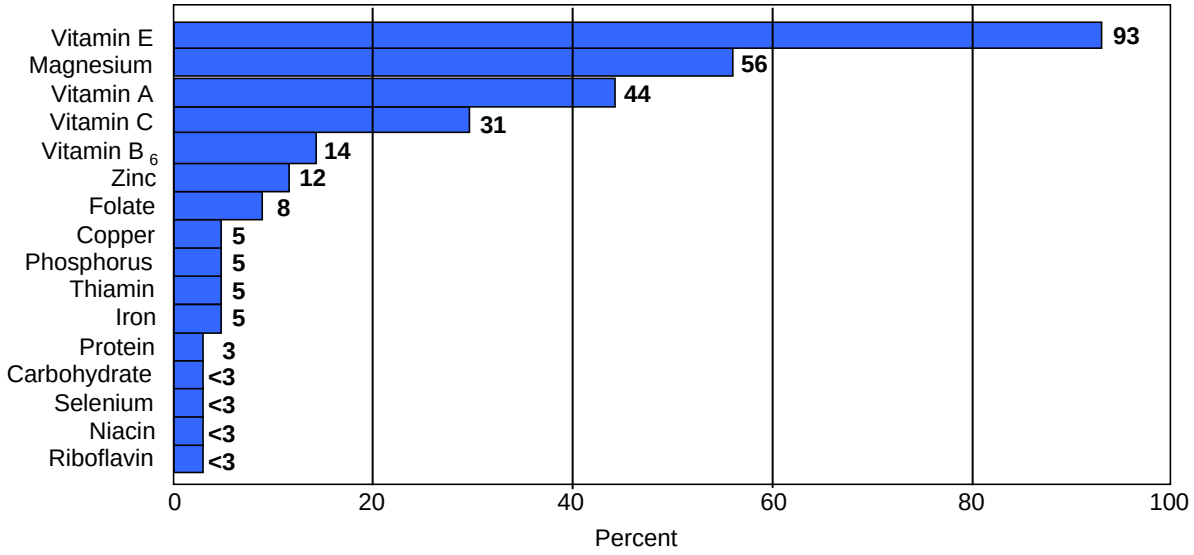
WWEIA, NHANES respondents were asked to provide only one 24-hour recall in 2001, respondents were asked to provide two 24-hour recalls in 2002. For this report, the two 24-hour recalls collected from respondents in 2002 were used to estimate the variance components. Working under the assumption that the proportion of total variation attributable to within-individual effects is relatively stable over time, the usual intake distributions were estimated from the entire collection of day 1 intakes from 2001-2002. Evaluation of each population subgroup in relation to the DRIs was carried out using these estimated distributions that reflect only the estimated between-individual variation. The within-individual variance estimates produced for this report from the WWEIA, NHANES 2002 are available on the Food Surveys Research Group website at www.ars.usda.gov/ba/bhnrc/fsrg. Further discussion of the procedures used for estimating usual intake distributions and making the comparison to the DRIs is provided in Appendix B.

Selected Results on the Adequacy of American Diets

Estimated Average Requirements (EAR)

The following graph summarizes results on adequacy of intakes reported in 2001-2002 for nutrients for which an EAR has been established by the Institute of Medicine (1-5). The EAR is the average daily nutrient intake level estimated to meet the requirement of half of the healthy individuals in a particular life stage and gender group. It is used to estimate the prevalence of inadequate intakes in a population group. Percentages with inadequate intakes vary by gender/age groups as shown in Tables A1-17 that follow. Results shown below are the estimated percentages of Americans with inadequate intakes as assessed by food intake only averaged across all individuals.

Percentage of Americans with Inadequate Intakes from Food Based on Estimated Average Requirements



Source: What We Eat in America, NHANES 2001-2002, 1 day, individuals 1+ years, excluding breast-fed children and pregnant or lactating females

Estimated Average Requirements (EAR) (continued)

- In 2001-2002, most Americans had inadequate dietary intakes of vitamin E. The prevalence of inadequacy was also high for magnesium, vitamin A, and vitamin C with one-third to more than one-half of the population having inadequate intakes from food.
- For some nutrients, intakes were inadequate only for certain segments of the population: vitamin B_6 for females over 50 years of age, and zinc for males and females over 70 years of age and females 14-18 years of age.
- Most Americans had adequate intakes from food for carbohydrate, selenium, niacin, and riboflavin.
- Children ages 1-8 years and males age 9 years and older generally had adequate dietary intakes of folate, copper, phosphorus, thiamin, iron, and protein. The proportion of females with adequate intakes was lower. In particular, only about half of females ages 9-18 years had adequate intakes of phosphorus.

Adequate Intakes (AI)

The following bullets summarize results on intakes reported in 2001-2002 for selected nutrients for which an Adequate Intake has been established: vitamin K, calcium, potassium, and dietary fiber (1,4-6). The AI for a nutrient is the recommended average daily intake level that is assumed to be adequate. **It is important to note that, unlike an EAR, an AI cannot be used to estimate the prevalence of inadequacy in a population.** Further, the percentages of the population above the AI may underestimate the true percentage with adequate intakes. Percentages with intakes above the AI vary by gender-age groups as shown in Tables B18-20 and B22 that follow. The summary below is based on the estimated percentage of Americans with intakes from food only at or greater than the AI averaged across all individuals.

- For vitamin K and calcium, just over 1 in 4 Americans met their AI. For calcium, females were even less likely than males to have intakes above their AI.
- For dietary fiber and potassium, less than 5% had intakes above their AI.

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Section B. Usual Nutrient Intakes from Food, 2001-2002, Compared to Adequate Intakes

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Appendixes

Section A. Tables

Usual Nutrient Intakes from Food, 2001-2002, Compared to Estimated Average Requirements

Table A1. Vitamin A (RAE[†]): Usual Intakes from Food, 2001-2002, Compared to Estimated Average Requirements

	N	Mean	SE	Percentiles							EAR	% Less Than EAR	SE[*]
				5	10	25	50	75	90	95			
Males and females:													
1 - 3	798	532	23.7	285	330	410	512	632	760	845	210	<3	
4 - 8	920	573	26.3	291	338	425	542	687	846	959	275	4	1.2
Males:													
9 - 13	574	670	49.7	366	418	518	643	777	936	1071	445	13	4.6
14 - 18	727	638	39.0	272	328	440	597	793	1001	1140	630	55	6.1
19 - 30	552	615	47.2	235	288	394	559	752	973	1188	625	59	12.3
31 - 50	785	647	36.3	261	317	432	594	784	1009	1203	625	55	4.6
51 - 70	651	699	42.9	241	298	413	588	843	1202	1519	625	55	3.3
71+	392	660	30.0	288	347	461	616	809	1028	1184	625	51	4.4
19+	2380	656	28.8	238	296	413	577	797	1077	1315	625	57	3.1
Females:													
9 - 13	597	536	37.5	233	280	372	501	662	834	955	420	34	6.0
14 - 18	677	513	35.8	180	225	323	461	635	850	1025	485	54	5.7
19 - 30	465	487	26.3	203	249	338	458	603	763	874	500	58	5.4
31 - 50	754	567	34.8	233	281	376	513	695	912	1078	500	48	5.3
51 - 70	643	601	23.8	244	294	396	543	739	976	1153	500	43	3.5
71+	405	600	26.3	302	349	438	559	713	897	1036	500	38	5.0
19+	2267	564	18.4	230	280	377	514	691	903	1064	500	48	3.3
All persons 1+	8940	600	18.1									44[#]	

[†] Retinol Activity Equivalents. 1 RAE = 1 µg retinol, 12 µg β-carotene, 24 µg α-carotene.
[*] Standard error not displayed when percentage is <3 or >97 (Appendix C).
[#] Percentage computed as weighted average of estimates for gender/age subgroups comprising the composite group. Standard error not displayed (Appendix C).
Source: What We Eat in America, NHANES 2001-2002, all individuals 1+ years, excludes breast-fed children and pregnant or lactating females. EAR from reference 4.

Table A2. Vitamin E (mg α-tocopherol): Usual Intakes from Food, 2001-2002, Compared to Estimated Average Requirements

	N	Mean	SE	Percentiles							EAR	% Less Than EAR	SE*
				5	10	25	50	75	90	95			
Males and females:													
1 - 3	798	4.0	0.14	2.1	2.4	3.0	3.7	4.7	5.8	6.6	5	80	3.3
4 - 8	920	5.0	0.17	3.2	3.5	4.1	4.8	5.7	6.7	7.4	6	80	4.1
Males:													
9 - 13	574	6.0	0.23	4.0	4.4	5.1	5.9	6.8	7.8	8.5	9	97	1.8
14 - 18	727	7.3	0.31	4.5	4.9	5.9	7.0	8.4	10.0	11.1	12	>97	
19 - 30	552	8.1	0.42	4.1	4.8	6.0	7.6	9.8	12.1	13.8	12	89	4.4
31 - 50	785	8.5	0.37	4.9	5.5	6.6	8.1	10.1	12.1	13.5	12	90	3.5
51 - 70	651	7.9	0.36	3.8	4.4	5.6	7.3	9.5	12.1	14.1	12	90	2.6
71+	392	6.9	0.33	3.3	3.8	4.8	6.3	8.3	10.8	12.7	12	94	1.9
19+	2380	8.2	0.22	4.1	4.7	5.9	7.6	9.8	12.3	14.2	12	89	1.8
Females:													
9 - 13	597	5.6	0.35	3.3	3.6	4.3	5.2	6.4	7.8	8.9	9	95	3.6
14 - 18	677	5.6	0.17	3.1	3.5	4.3	5.3	6.6	7.9	8.8	12	>97	
19 - 30	465	6.2	0.30	2.8	3.4	4.4	5.8	7.5	9.4	10.8	12	>97	
31 - 50	754	6.4	0.28	3.3	3.7	4.7	6.0	7.6	9.5	10.9	12	>97	
51 - 70	643	6.5	0.31	3.2	3.7	4.7	6.0	7.8	9.8	11.3	12	96	1.4
71+	405	5.6	0.31	2.9	3.3	4.0	5.1	6.5	8.3	9.8	12	>97	
19+	2267	6.3	0.20	3.1	3.6	4.5	5.8	7.5	9.5	11.0	12	97	0.8
All persons 1+	8940	6.7	0.14									93#	

* Standard error not displayed when percentage is <3 or >97 (Appendix C).

Percentage computed as weighted average of estimates for gender/age subgroups comprising the composite group. Standard error not displayed (Appendix C).

Source: What We Eat in America, NHANES 2001-2002, all individuals 1+ years, excludes breast-fed children and pregnant or lactating females. EAR from reference 3.

Table A3. Thiamin (mg): Usual Intakes from Food, 2001-2002, Compared to Estimated Average Requirements

	N	Mean	SE	Percentiles							EAR	% Less Than EAR	SE*
				5	10	25	50	75	90	95			
Males and females:													
1 - 3	798	1.20	0.023	0.77	0.85	0.99	1.17	1.38	1.59	1.72	0.4	<3	
4 - 8	920	1.45	0.026	0.96	1.05	1.22	1.43	1.65	1.87	2.02	0.5	<3	
Males:													
9 - 13	574	1.78	0.088	1.20	1.31	1.50	1.74	2.01	2.30	2.50	0.7	<3	
14 - 18	727	1.96	0.076	1.17	1.31	1.58	1.91	2.28	2.67	2.94	1.0	<3	
19 - 30	552	2.01	0.094	1.09	1.25	1.55	1.93	2.40	2.89	3.21	1.0	3	0.9
31 - 50	785	1.96	0.056	1.15	1.29	1.55	1.89	2.30	2.73	3.02	1.0	<3	
51 - 70	651	1.73	0.062	0.97	1.10	1.34	1.65	2.03	2.47	2.79	1.0	6	1.1
71+	392	1.62	0.049	0.94	1.06	1.29	1.57	1.89	2.23	2.47	1.0	7	1.6
19+	2380	1.89	0.044	1.04	1.19	1.45	1.80	2.24	2.72	3.04	1.0	4	0.5
Females:													
9 - 13	597	1.44	0.048	1.03	1.10	1.24	1.42	1.61	1.80	1.93	0.7	<3	
14 - 18	677	1.40	0.052	0.76	0.87	1.08	1.35	1.67	1.99	2.19	0.9	12	2.6
19 - 30	465	1.48	0.058	0.81	0.94	1.16	1.44	1.76	2.08	2.28	0.9	8	2.5
31 - 50	754	1.38	0.040	0.88	0.97	1.12	1.32	1.56	1.84	2.05	0.9	6	1.4
51 - 70	643	1.32	0.043	0.77	0.87	1.05	1.29	1.55	1.83	2.01	0.9	12	2.0
71+	405	1.27	0.041	0.79	0.87	1.02	1.21	1.45	1.73	1.93	0.9	12	2.3
19+	2267	1.37	0.032	0.80	0.90	1.09	1.32	1.59	1.89	2.10	0.9	10	1.2
All persons 1+	8940	1.60	0.027									5#	

* Standard error not displayed when percentage is <3 or >97 (Appendix C).

Percentage computed as weighted average of estimates for gender/age subgroups comprising the composite group. Standard error not displayed (Appendix C).

Source: What We Eat in America, NHANES 2001-2002, all individuals 1+ years, excludes breast-fed children and pregnant or lactating females. EAR from reference 2.

Table A4. Riboflavin (mg): Usual Intakes from Food, 2001-2002, Compared to Estimated Average Requirements

	N	Mean	SE	Percentiles							EAR	% Less Than EAR	SE*
				5	10	25	50	75	90	95			
Males and females:													
1 - 3	798	1.97	0.042	1.18	1.33	1.61	1.94	2.29	2.64	2.89	0.4	<3	
4 - 8	920	2.10	0.051	1.27	1.43	1.71	2.05	2.43	2.83	3.10	0.5	<3	
Males:													
9 - 13	574	2.51	0.131	1.53	1.70	2.02	2.43	2.91	3.41	3.76	0.8	<3	
14 - 18	727	2.57	0.106	1.44	1.63	1.99	2.46	3.03	3.64	4.06	1.1	<3	
19 - 30	552	2.55	0.117	1.36	1.56	1.94	2.44	3.03	3.67	4.12	1.1	<3	
31 - 50	785	2.67	0.072	1.51	1.72	2.11	2.59	3.14	3.72	4.11	1.1	<3	
51 - 70	651	2.44	0.067	1.29	1.48	1.84	2.31	2.87	3.52	4.02	1.1	<3	
71+	392	2.22	0.067	1.14	1.32	1.66	2.11	2.66	3.25	3.67	1.1	4	1.1
19+	2380	2.55	0.057	1.34	1.55	1.94	2.44	3.01	3.66	4.14	1.1	<3	
Females:													
9 - 13	597	1.94	0.072	1.21	1.34	1.58	1.89	2.25	2.61	2.83	0.8	<3	
14 - 18	677	1.80	0.079	0.86	1.02	1.32	1.72	2.19	2.66	2.98	0.9	6	1.5
19 - 30	465	1.80	0.071	0.89	1.06	1.36	1.75	2.19	2.62	2.90	0.9	5	1.5
31 - 50	754	1.92	0.052	1.12	1.26	1.51	1.84	2.23	2.66	2.97	0.9	<3	
51 - 70	643	1.86	0.042	1.05	1.20	1.48	1.82	2.19	2.57	2.80	0.9	<3	
71+	405	1.74	0.052	0.98	1.11	1.35	1.65	2.02	2.47	2.81	0.9	<3	
19+	2267	1.86	0.040	1.02	1.17	1.44	1.79	2.19	2.62	2.92	0.9	<3	
All persons 1+	8940	2.18	0.038									<3#	

* Standard error not displayed when percentage is <3 or >97 (Appendix C).

Percentage computed as weighted average of estimates for gender/age subgroups comprising the composite group. Standard error not displayed (Appendix C).

Source: What We Eat in America, NHANES 2001-2002, all individuals 1+ years, excludes breast-fed children and pregnant or lactating females. EAR from reference 2.

Table A5. Niacin[†] (mg): Usual Intakes from Food, 2001-2002, Compared to Estimated Average Requirements

	N	Mean	SE	Percentiles							EAR[‡]	% Less Than EAR	SE[*]
				5	10	25	50	75	90	95			
Males and females:													
1 - 3	798	13.5	0.27	7.8	8.9	10.9	13.2	15.7	18.5	20.5	5	<3	
4 - 8	920	18.2	0.48	11.7	12.9	15.1	17.8	20.8	23.9	26.1	6	<3	
Males:													
9 - 13	574	22.5	1.03	14.0	15.6	18.5	22.0	26.0	30.1	32.9	9	<3	
14 - 18	727	27.0	1.01	16.7	18.7	22.1	26.3	31.0	36.2	39.8	12	<3	
19 - 30	552	29.4	1.16	17.5	19.6	23.5	28.5	34.4	40.5	44.7	12	<3	
31 - 50	785	28.3	0.75	17.3	19.3	22.9	27.4	32.8	38.4	42.2	12	<3	
51 - 70	651	24.8	0.68	14.9	16.6	19.8	23.8	28.6	34.0	38.0	12	<3	
71+	392	21.6	0.76	12.9	14.5	17.4	21.0	25.0	29.2	32.1	12	3	0.8
19+	2380	27.0	0.56	15.8	17.8	21.4	26.0	31.6	37.7	41.9	12	<3	
Females:													
9 - 13	597	18.5	0.55	13.6	14.5	16.3	18.3	20.5	22.7	24.1	9	<3	
14 - 18	677	18.6	0.63	10.7	12.0	14.6	18.0	21.9	25.9	28.6	11	6	1.4
19 - 30	465	20.2	0.75	11.1	12.9	15.9	19.7	23.9	28.2	31.2	11	5	1.6
31 - 50	754	19.1	0.52	11.5	12.8	15.3	18.5	22.2	26.1	28.8	11	4	0.9
51 - 70	643	18.3	0.48	11.2	12.5	14.9	17.9	21.2	24.6	26.7	11	4	1.1
71+	405	16.1	0.66	9.4	10.5	12.5	15.2	18.7	22.8	25.9	11	13	2.4
19+	2267	18.7	0.41	10.8	12.2	14.8	18.1	21.9	26.0	28.8	11	5	0.8
All persons 1+	8940	21.9	0.31									<3[#]	

[†] The intake of niacin is for preformed niacin only.

[‡] EAR for niacin is given as niacin equivalents which include preformed niacin and contributions from tryptophan. Therefore, the estimated percentage less than the EAR may be overestimated.

[*] Standard error not displayed when percentage is <3 or >97 (Appendix C).

[#] Percentage computed as weighted average of estimates for gender/age subgroups comprising the composite group. Standard error not displayed (Appendix C).

Source: What We Eat in America, NHANES 2001-2002, all individuals 1+ years, excludes breast-fed children and pregnant or lactating females. EAR from reference 2.

Table A6. Vitamin B_6 (mg): Usual Intakes from Food, 2001-2002, Compared to Estimated Average Requirements

	N	Mean	SE	Percentiles							EAR	% Less Than EAR	SE*
				5	10	25	50	75	90	95			
Males and females:													
1 - 3	798	1.34	0.039	0.79	0.89	1.07	1.30	1.57	1.84	2.02	0.4	<3	
4 - 8	920	1.50	0.048	0.87	0.98	1.19	1.46	1.76	2.06	2.27	0.5	<3	
Males:													
9 - 13	574	1.81	0.105	1.10	1.23	1.46	1.76	2.10	2.46	2.70	0.8	<3	
14 - 18	727	2.17	0.097	1.27	1.42	1.70	2.08	2.53	3.04	3.40	1.1	<3	
19 - 30	552	2.36	0.127	1.24	1.42	1.76	2.24	2.83	3.44	3.85	1.1	<3	
31 - 50	785	2.31	0.071	1.30	1.47	1.79	2.21	2.71	3.26	3.67	1.1	<3	
51 - 70	651	2.09	0.063	1.10	1.27	1.58	2.00	2.50	3.02	3.38	1.4	16	2.2
71+	392	1.96	0.074	0.94	1.11	1.43	1.83	2.32	2.92	3.39	1.4	23	3.2
19+	2380	2.23	0.056	1.17	1.35	1.68	2.11	2.65	3.25	3.68		7#	
Females:													
9 - 13	597	1.52	0.061	0.89	1.00	1.21	1.48	1.78	2.09	2.29	0.8	<3	
14 - 18	677	1.48	0.049	0.78	0.90	1.11	1.41	1.78	2.16	2.41	1.0	16	2.7
19 - 30	465	1.54	0.064	0.73	0.87	1.13	1.47	1.86	2.24	2.58	1.1	23	3.5
31 - 50	754	1.53	0.053	0.82	0.93	1.16	1.45	1.81	2.21	2.50	1.1	21	3.0
51 - 70	643	1.56	0.045	0.85	0.98	1.21	1.50	1.84	2.21	2.46	1.3	33	3.4
71+	405	1.44	0.061	0.73	0.84	1.04	1.32	1.69	2.17	2.56	1.3	49	4.0
19+	2267	1.53	0.036	0.79	0.92	1.15	1.45	1.81	2.22	2.51		28#	
All persons 1+	8940	1.81	0.034									14#	

* Standard error not displayed when percentage is <3 or >97 (Appendix C).

Percentage computed as weighted average of estimates for gender/age subgroups comprising the composite group. Standard error not displayed (Appendix C).

Source: What We Eat in America, NHANES 2001-2002, all individuals 1+ years, excludes breast-fed children and pregnant or lactating females. EAR from reference 2.

Table A7. Folate (DFE[†]): Usual Intakes from Food, 2001-2002, Compared to Estimated Average Requirements

	N	Mean	SE	Percentiles							EAR	% Less Than EAR	SE[*]
				5	10	25	50	75	90	95			
Males and females:													
1 - 3	798	416	12.4	221	254	315	369	493	602	679	120	<3	
4 - 8	920	528	18.8	308	343	411	501	615	745	840	160	<3	
Males:													
9 - 13	574	644	33.4	380	424	509	619	752	895	996	250	<3	
14 - 18	727	683	32.4	351	405	508	647	817	1004	1135	330	4	1.2
19 - 30	552	696	32.7	312	366	476	641	855	1098	1273	320	6	1.2
31 - 50	785	655	24.2	356	403	493	616	773	955	1088	320	<3	
51 - 70	651	576	20.2	300	342	426	537	684	868	982	320	7	1.0
71+	392	556	24.3	269	312	399	515	658	839	986	320	11	2.3
19+	2380	636	17.7	313	361	455	586	762	972	1126	320	6	0.7
Females[‡]:													
9 - 13	597	512	25.1	359	385	435	501	577	652	700	250	<3	
14 - 18	677	500	41.0	242	281	360	473	607	751	851	330	19	4.8
19 - 30	465	519	27.1	245	291	376	491	636	786	882	320	14	3.3
31 - 50	754	472	21.3	259	293	357	444	553	684	783	320	16	2.8
51 - 70	643	482	21.3	264	300	369	461	571	691	773	320	14	2.5
71+	405	452	19.3	242	272	333	418	532	671	777	320	21	3.2
19+	2267	483	16.9	251	288	359	455	575	711	810	320	16	1.9
All persons 1+	8940	554	13.0									8[#]	

[†] Dietary Folate Equivalents. 1 DFE = 1 µg food folate = 0.6 µg of folic acid from fortified food.

[‡] It is recommended that all women capable of becoming pregnant consume 400 µg from supplements or fortified foods in addition to intake of food folate from a varied diet (2).

[*] Standard error not displayed when percentage is <3 or >97 (Appendix C).

[#] Percentage computed as weighted average of estimates for gender/age subgroups comprising the composite group. Standard error not displayed (Appendix C).

Source: What We Eat in America, NHANES 2001-2002, all individuals 1+ years, excludes breast-fed children and pregnant or lactating females. EAR from reference 2.

Table A8. Vitamin B_{12} (μg): Usual Intakes from Food, 2001-2002, Compared to Estimated Average Requirements

	N	Mean	SE	Percentiles							EAR	% Less Than EAR	SE*
				5	10	25	50	75	90	95			
Males and females:													
1 - 3	798	4.51	0.137	2.40	2.79	3.50	4.38	5.36	6.38	7.08	0.7	<3	
4 - 8	920	4.75	0.175	2.71	3.08	3.76	4.62	5.58	6.59	7.26	1.0	<3	
Males:													
9 - 13	574	6.00	0.478	3.56	3.98	4.76	5.84	6.89	7.93	8.96	1.5	<3	
14 - 18	727	6.69	0.417	3.12	3.68	4.79	6.30	8.16	10.19	11.61	2.0	<3	
19 - 30	552	6.41	0.415	2.97	3.48	4.47	5.80	7.50	9.83	11.90	2.0	<3	
31 - 50	785	6.49	0.346	3.24	3.73	4.67	5.98	7.72	9.82	11.43	2.0	<3	
51 - 70	651	6.70	0.511	2.70	3.20	4.17	5.63	7.87	11.20	14.21	2.0	§	
71+	392	5.49	0.304	1.90	2.38	3.38	4.83	6.79	9.23	11.21	2.0	§	
19+	2380	6.45	0.277	2.79	3.31	4.30	5.69	7.61	10.27	12.58	2.0	§	
Females:													
9 - 13	597	4.40	0.164	2.31	2.69	3.38	4.24	5.27	6.32	6.99	1.5	<3	
14 - 18	677	4.16	0.230	1.76	2.13	2.85	3.82	5.05	6.54	7.69	2.0	8	1.7
19 - 30	465	4.27	0.224	1.73	2.09	2.82	3.87	5.28	6.93	8.13	2.0	9	2.1
31 - 50	754	4.49	0.374	1.83	2.18	2.88	3.91	5.37	7.37	9.05	2.0	7	1.5
51 - 70	643	4.15	0.191	1.79	2.14	2.81	3.75	5.00	6.59	7.85	2.0	§	
71+	405	4.18	0.334	1.61	1.92	2.58	3.59	5.06	7.05	8.72	2.0	§	
19+	2267	4.33	0.204	1.73	2.09	2.80	3.78	5.15	7.24	9.00	2.0	§	
All persons 1+	8940	5.28	0.384									§	

§ Comparison to EAR for ages 50 and older not presented because 10 to 30 percent of older people may malabsorb food-bound vitamin B_{12}. This age group is advised to meet the vitamin B_{12} requirement mainly by consuming foods fortified with vitamin B_{12} or a supplement containing it (2).

* Standard error not displayed when percentage is <3 or >97 (Appendix C).

Percentage computed as weighted average of estimates for gender/age subgroups comprising the composite group. Standard error not displayed (Appendix C).

Source: What We Eat in America, NHANES 2001-2002, all individuals 1+ years, excludes breast-fed children and pregnant or lactating females. EAR from reference 2.

Table A9.1. Vitamin C (mg): Usual Intakes from Food, 2001-2002, Compared to Estimated Average Requirements

	N	Mean	SE	Percentiles							EAR[†]	% Less Than EAR	SE[*]
				5	10	25	50	75	90	95			
Males and females:													
1 - 3	798	92.1	3.87	33	41	59	84	116	153	180	13	<3	
4 - 8	920	80.7	4.27	29	36	51	74	103	134	156	22	<3	
Males:													
9 - 13	574	80.2	5.77	35	41	55	75	100	126	144	39	8	2.9
14 - 18	727	100.0	8.53	36	44	62	89	127	171	201	63	26	5.8
19 - 30	552	116.2	14.10	28	37	58	97	153	222	271	75	37	5.9
31 - 50	785	102.8	7.78	29	38	57	89	133	186	225	75	40	4.7
51 - 70	651	101.8	5.22	29	38	58	90	132	181	216	75	39	3.5
71+	392	93.4	5.63	25	34	54	84	122	164	193	75	42	4.7
19+	2380	105.2	36.87	27	36	56	89	136	194	238	75	40	9.7
Females:													
9 - 13	597	81.0	6.09	33	40	54	74	102	132	152	39	9	2.5
14 - 18	677	75.6	6.40	20	27	41	64	97	139	170	56	42	4.8
19 - 30	465	82.3	6.67	24	31	46	70	105	148	180	60	40	3.9
31 - 50	754	77.0	4.88	26	32	47	68	98	133	158	60	41	4.3
51 - 70	643	93.7	4.80	29	38	56	84	121	162	192	60	29	3.3
71+	405	81.6	4.24	20	27	44	72	110	149	176	60	40	4.0
19+	2267	83.6	2.62	24	31	47	73	108	150	179	60	38	2.2
All persons 1+	8940	91.8	2.77									31[#]	

[†] The EAR for vitamin C for smokers is 35 mg greater than that for nonsmokers (3). The EAR used in this table is that for nonsmokers. Smoking status was not considered in these estimates, but is considered in the estimates shown in Table A9.2.

[*] Standard error not displayed when percentage is <3 or >97 (Appendix C).

[#] Percentage computed as weighted average of estimates for gender/age subgroups comprising the composite group. Standard error not displayed (Appendix C).

Source: What We Eat in America, NHANES 2001-2002, all individuals 1+ years, excludes breast-fed children and pregnant or lactating females. EAR from reference 3.

Table A9.2. Vitamin C (mg): Usual Intakes from Food, 2001-2002, Compared to Estimated Average Requirements

Adults 20 and older by smoking status[†]

	N[‡]	Mean	SE	Percentiles							EAR[§]	% Less Than EAR	SE
				5	10	25	50	75	90	95			
Males:													
20 - 50:													
Smokers	428	100.1	10.66	23	31	50	81	129	192	241	110	67	6.1
Non-smokers . . .	779	110.8	7.23	32	41	62	96	144	201	240	75	35	4.3
51 and older:													
Smokers	221	83.4	7.43	18	25	42	69	110	159	196	110	75	4.0
Non-smokers . . .	814	103.7	4.58	29	39	60	92	134	184	219	75	37	3.0
20 and older:													
Smokers	649	95.8	8.15	21	28	46	77	123	186	236	110	69	4.5
Non-smokers . . .	1593	108.6	4.47	30	39	61	94	142	197	236	75	36	2.8
Females:													
20 - 50:													
Smokers	289	56.3	5.76	16	21	32	49	73	101	122	95	88	4.6
Non-smokers . . .	827	85.9	3.78	28	35	51	76	110	149	178	60	34	3.0
51 and older:													
Smokers	137	65.2	6.97	17	23	35	55	85	120	148	95	81	5.1
Non-smokers . . .	908	94.3	3.53	28	37	55	84	123	165	194	60	29	2.7
20 and older:													
Smokers	426	59.3	4.78	15	20	31	50	77	111	136	95	84	3.2
Non-smokers . . .	1735	90.0	2.56	27	35	53	80	116	158	188	60	32	1.8
Adults 20 and older:													
Smokers	1075	79.8	6.41	18	25	39	64	103	156	196		76[#]	
Non-smokers . . .	3328	98.6	3.05	29	38	56	86	128	176	210		34[#]	

[†] Smoking status was available from NHANES 2001-2002 only for individuals 20 years and older (13). Smokers were defined as those individuals reporting that they currently smoked cigarettes, pipes, or cigars every day or some days.

[‡] Excludes individuals 20 years and older without all of the necessary smoking data available to determine status.

[§] The EAR for vitamin C for smokers is 35 mg greater than that for nonsmokers (3).

[#] Percentage computed as weighted average of estimates for gender/age subgroups comprising the composite group. Standard error not displayed (Appendix C).

Source: What We Eat in America, NHANES 2001-2002, all individuals 1+ years, excludes breast-fed children and pregnant or lactating females. EAR from reference 3.

Table A10. Phosphorus (mg): Usual Intakes from Food, 2001-2002, Compared to Estimated Average Requirements

	N	Mean	SE	Percentiles							EAR	% Less Than EAR	SE*
				5	10	25	50	75	90	95			
Males and females:													
1 - 3	798	1065	23.7	639	721	867	1044	1236	1431	1563	380	<3	
4 - 8	920	1172	21.5	730	818	970	1148	1346	1553	1696	405	<3	
Males:													
9 - 13	574	1431	67.2	987	1066	1211	1399	1618	1838	1982	1055	9	3.3
14 - 18	727	1575	48.5	954	1066	1271	1529	1827	2139	2349	1055	9	2.0
19 - 30	552	1658	58.0	966	1097	1328	1612	1938	2277	2502	580	<3	
31 - 50	785	1644	31.4	979	1097	1321	1600	1911	2243	2468	580	<3	
51 - 70	651	1419	43.0	809	917	1111	1352	1642	1985	2251	580	<3	
71+	392	1240	36.7	719	818	994	1216	1461	1690	1834	580	<3	
19+	2380	1552	25.0	874	994	1215	1497	1823	2174	2421	580	<3	
Females:													
9 - 13	597	1141	38.7	719	795	935	1112	1315	1526	1663	1055	42	5.5
14 - 18	677	1099	34.8	585	676	847	1065	1314	1566	1730	1055	49	4.1
19 - 30	465	1160	36.1	606	717	911	1136	1385	1630	1785	580	4	1.5
31 - 50	754	1167	28.7	715	798	952	1142	1345	1556	1709	580	<3	
51 - 70	643	1062	21.2	605	689	842	1036	1253	1467	1607	580	4	0.8
71+	405	946	21.4	583	650	770	918	1090	1274	1403	580	5	1.1
19+	2267	1109	18.0	630	718	879	1080	1303	1528	1684	580	3	0.5
All persons 1+	8940	1304	14.0									5#	

* Standard error not displayed when percentage is <3 or >97 (Appendix C).

Percentage computed as weighted average of estimates for gender/age subgroups comprising the composite group. Standard error not displayed (Appendix C).

Source: What We Eat in America, NHANES 2001-2002, all individuals 1+ years, excludes breast-fed children and pregnant or lactating females. EAR from reference 1.

Table A11. Magnesium (mg): Usual Intakes from Food, 2001-2002, Compared to Estimated Average Requirements

	N	Mean	SE	Percentiles							EAR	% Less Than EAR	SE*
				5	10	25	50	75	90	95			
Males and females:													
1 - 3	798	188	3.7	118	132	156	185	216	247	267	65	<3	
4 - 8	920	212	5.0	137	151	177	209	243	277	300	110	<3	
Males:													
9 - 13	574	250	9.5	179	193	217	246	279	313	336	200	14	4.2
14 - 18	727	284	8.1	167	188	226	274	332	391	431	340	78	3.3
19 - 30	552	328	12.1	188	213	259	317	385	457	506	330	55	4.9
31 - 50	785	334	8.0	209	232	273	325	386	448	489	350	61	3.6
51 - 70	651	310	9.4	166	190	235	294	366	446	506	350	70	3.3
71+	392	279	9.1	152	175	217	271	332	393	433	350	81	3.1
19+	2380	322	6.2	181	206	251	309	378	452	505		64#	
Females:													
9 - 13	597	215	8.5	131	146	173	208	251	294	322	200	44	6.2
14 - 18	677	206	8.1	112	128	158	197	244	295	329	300	91	2.6
19 - 30	465	235	9.6	113	136	176	226	284	345	386	255	64	4.2
31 - 50	754	245	7.2	135	154	189	235	290	348	389	265	65	3.6
51 - 70	643	246	6.8	138	157	191	236	292	350	389	265	64	3.1
71+	405	213	6.6	127	142	168	203	246	296	333	265	82	3.2
19+	2267	240	5.0	128	148	184	229	284	345	386		67#	
All persons 1+	8940	265	4.1									56#	

* Standard error not displayed when percentage is <3 or >97 (Appendix C).

Percentage computed as weighted average of estimates for gender/age subgroups comprising the composite group. Standard error not displayed (Appendix C).

Source: What We Eat in America, NHANES 2001-2002, all individuals 1+ years, excludes breast-fed children and pregnant or lactating females. EAR from reference 1.

Table A12. Iron (mg): Usual Intakes from Food, 2001-2002, Compared to Estimated Average Requirements

	N	Mean	SE	Percentiles							EAR	% Less Than EAR[†]	SE
				5	10	25	50	75	90	95			
Males and females:													
1 - 3	798	11.0	0.23	5.9	6.8	8.4	10.5	13.0	15.7	17.7	3.0	<3	
4 - 8	920	13.7	0.39	8.9	9.8	11.3	13.3	15.6	18.0	19.6	4.1	<3	
Males:													
9 - 13	574	17.0	0.92	10.5	11.6	13.7	16.4	19.6	23.0	25.4	5.9	<3	
14 - 18	727	19.1	0.76	11.2	12.6	15.0	18.3	22.3	26.7	29.9	7.7	<3	
19 - 30	552	19.2	0.70	9.7	11.2	14.1	18.0	22.9	28.6	32.8	6.0	<3	
31 - 50	785	18.5	0.64	10.4	11.8	14.4	17.7	21.8	26.2	29.3	6.0	<3	
51 - 70	651	17.1	0.59	8.8	10.1	12.5	16.0	20.3	25.5	29.3	6.0	<3	
71+	392	15.5	0.45	8.1	9.4	11.7	14.7	18.4	22.7	25.9	6.0	<3	
19+	2380	18.0	0.42	9.5	10.8	13.5	17.0	21.5	26.5	30.2		<3[#]	
Females:													
9 - 13	597	13.7	0.45	8.5	9.4	11.1	13.3	15.9	18.6	20.4	5.7	<3	
14 - 18	677	13.3	0.65	6.6	7.7	9.7	12.5	15.9	19.9	22.8	7.9	16	
19 - 30	465	13.9	0.56	7.3	8.5	10.7	13.4	16.4	19.9	22.3	8.1	15	
31 - 50	754	13.1	0.40	7.6	8.5	10.2	12.4	15.1	18.3	20.7	8.1	17	
51 - 70	643	13.0	0.39	7.7	8.6	10.3	12.4	15.1	18.1	20.1	5.0	<3	
71+	405	12.3	0.41	7.2	8.0	9.5	11.5	14.2	17.5	20.0	5.0	<3	
19+	2267	13.1	0.30	7.4	8.3	10.2	12.5	15.3	18.6	21.0		10[#]	
All persons 1+	8940	15.3	0.27									5[#]	

[†] Comparison to EAR determined using probability approach as discussed in Appendix B. Standard errors for the estimated percentage less than the EAR not produced.
[#] Percentage computed as weighted average of estimates for gender/age subgroups comprising the composite group. Standard error not displayed (Appendix C).
Source: What We Eat in America, NHANES 2001-2002, all individuals 1+ years, excludes breast-fed children and pregnant or lactating females. EAR from reference 4.

Table A13. Zinc (mg): Usual Intakes from Food, 2001-2002, Compared to Estimated Average Requirements

	N	Mean	SE	Percentiles							EAR	% Less Than EAR	SE*
				5	10	25	50	75	90	95			
Males and females:													
1 - 3	798	8.3	0.22	5.0	5.6	6.7	8.0	9.5	11.3	12.6	2.5	<3	
4 - 8	920	10.0	0.30	6.1	6.8	8.1	9.7	11.7	13.7	15.0	4.0	<3	
Males:													
9 - 13	574	13.0	0.76	8.5	9.3	10.8	12.8	15.0	17.1	18.5	7.0	<3	
14 - 18	727	15.1	0.63	8.8	9.8	11.8	14.4	17.7	21.2	23.8	8.5	4	1.2
19 - 30	552	14.5	0.53	9.2	10.1	11.9	14.2	16.6	19.3	21.3	9.4	6	1.6
31 - 50	785	15.1	0.46	9.7	10.6	12.4	14.7	17.3	20.1	21.9	9.4	4	0.9
51 - 70	651	13.2	0.50	7.1	8.1	9.9	12.4	15.5	19.3	22.1	9.4	20	2.7
71+	392	12.0	0.51	6.7	7.5	9.0	11.1	13.8	17.4	20.4	9.4	30	3.9
19+	2380	14.2	0.28	8.2	9.3	11.1	13.6	16.6	19.9	22.3	9.4	11	1.0
Females:													
9 - 13	597	9.8	0.34	6.4	7.0	8.1	9.6	11.2	13.0	14.1	7.0	10	2.8
14 - 18	677	9.5	0.44	5.2	5.8	7.2	9.0	11.3	13.7	15.3	7.3	26	4.6
19 - 30	465	10.3	0.36	5.6	6.4	7.9	9.8	12.2	14.8	16.4	6.8	13	3.1
31 - 50	754	10.0	0.31	6.0	6.6	7.9	9.6	11.7	14.0	15.6	6.8	11	2.3
51 - 70	643	9.4	0.25	5.3	6.0	7.3	9.0	11.0	13.3	14.8	6.8	18	2.2
71+	405	8.2	0.39	4.7	5.2	6.2	7.6	9.5	11.9	13.8	6.8	36	4.1
19+	2267	9.7	0.19	5.4	6.1	7.5	9.2	11.3	13.9	15.7	6.8	17	1.6
All persons 1+	8940	11.6	0.15									12#	

* Standard error not displayed when percentage is <3 or >97 (Appendix C).

Percentage computed as weighted average of estimates for gender/age subgroups comprising the composite group. Standard error not displayed (Appendix C).

Source: What We Eat in America, NHANES 2001-2002, all individuals 1+ years, excludes breast-fed children and pregnant or lactating females. EAR from reference 4.

Table A14. Copper (mg): Usual Intakes from Food, 2001-2002, Compared to Estimated Average Requirements

	N	Mean	SE	Percentiles							EAR	% Less Than EAR	SE*
				5	10	25	50	75	90	95			
Males and females:													
1 - 3	798	0.76	0.017	0.43	0.49	0.60	0.74	0.90	1.07	1.19	0.260	<3	
4 - 8	920	0.95	0.019	0.66	0.72	0.82	0.94	1.07	1.20	1.29	0.340	<3	
Males:													
9 - 13	574	1.16	0.041	0.84	0.90	1.01	1.14	1.28	1.43	1.56	0.540	<3	
14 - 18	727	1.34	0.040	0.82	0.91	1.08	1.30	1.55	1.83	2.01	0.685	<3	
19 - 30	552	1.59	0.059	0.99	1.09	1.27	1.52	1.82	2.17	2.43	0.700	<3	
31 - 50	785	1.63	0.061	1.01	1.11	1.30	1.53	1.83	2.22	2.54	0.700	<3	
51 - 70	651	1.47	0.065	0.79	0.89	1.09	1.34	1.68	2.14	2.54	0.700	<3	
71+	392	1.24	0.046	0.74	0.83	0.99	1.19	1.42	1.69	1.90	0.700	3	1.0
19+	2380	1.54	0.042	0.88	0.98	1.18	1.44	1.76	2.17	2.52	0.700	<3	
Females:													
9 - 13	597	1.00	0.037	0.62	0.69	0.80	0.96	1.16	1.37	1.51	0.540	<3	
14 - 18	677	0.95	0.034	0.56	0.63	0.76	0.92	1.11	1.32	1.48	0.685	16	2.8
19 - 30	465	1.13	0.044	0.58	0.68	0.86	1.08	1.34	1.63	1.83	0.700	11	2.8
31 - 50	754	1.14	0.043	0.65	0.73	0.89	1.09	1.33	1.61	1.82	0.700	8	1.4
51 - 70	643	1.14	0.044	0.61	0.70	0.85	1.06	1.33	1.67	1.94	0.700	10	1.5
71+	405	0.95	0.024	0.62	0.67	0.77	0.91	1.08	1.28	1.42	0.700	14	2.5
19+	2267	1.11	0.023	0.61	0.70	0.85	1.05	1.30	1.60	1.82	0.700	10	1.1
All persons 1+	8940	1.24	0.021									5#	

* Standard error not displayed when percentage is <3 or >97 (Appendix C).

Percentage computed as weighted average of estimates for gender/age subgroups comprising the composite group. Standard error not displayed (Appendix C).

Source: What We Eat in America, NHANES 2001-2002, all individuals 1+ years, excludes breast-fed children and pregnant or lactating females. EAR from reference 4.

Table A15. Selenium (μg): Usual Intakes from Food, 2001-2002, Compared to Estimated Average Requirements

	N	Mean	SE	Percentiles							EAR	% Less Than EAR	SE*
				5	10	25	50	75	90	95			
Males and females:													
1 - 3	798	65	1.7	40	45	54	64	75	87	95	17	<3	
4 - 8	920	82	1.8	51	57	67	79	94	111	123	23	<3	
Males:													
9 - 13	574	103	4.3	71	77	87	102	115	131	144	35	<3	
14 - 18	727	118	4.5	74	82	97	115	137	158	172	45	<3	
19 - 30	552	131	4.7	80	89	106	127	151	176	193	45	<3	
31 - 50	785	132	4.4	81	90	107	128	152	180	200	45	<3	
51 - 70	651	116	3.2	67	75	90	110	134	162	183	45	<3	
71+	392	102	4.0	59	67	80	98	118	141	157	45	<3	
19+	2380	125	2.6	72	82	98	120	146	175	195	45	<3	
Females:													
9 - 13	597	82	2.7	55	60	69	80	93	106	114	35	<3	
14 - 18	677	83	2.1	49	55	66	80	96	113	125	45	3	0.9
19 - 30	465	99	4.8	48	57	73	93	117	145	169	45	4	1.4
31 - 50	754	93	2.9	57	63	74	89	106	126	141	45	<3	
51 - 70	643	85	2.0	55	61	71	84	98	111	120	45	<3	
71+	405	75	2.0	50	54	63	73	85	97	105	45	<3	
19+	2267	89	1.8	52	58	71	86	103	124	141	45	<3	
All persons 1+	8940	102	1.3									<3#	

* Standard error not displayed when percentage is <3 or >97 (Appendix C).

Percentage computed as weighted average of estimates for gender/age subgroups comprising the composite group. Standard error not displayed (Appendix C).

Source: What We Eat in America, NHANES 2001-2002, all individuals 1+ years, excludes breast-fed children and pregnant or lactating females. EAR from reference 3.

Table A16. Carbohydrate (g): Usual Intakes from Food, 2001-2002, Compared to Estimated Average Requirements

	N	Mean	SE	Percentiles							EAR	% Less Than EAR	SE*
				5	10	25	50	75	90	95			
Males and females:													
1 - 3	798	204	4.2	129	143	167	198	235	271	295	100	<3	
4 - 8	920	257	4.7	186	201	225	254	286	317	337	100	<3	
Males:													
9 - 13	574	309	10.0	209	229	264	304	349	394	423	100	<3	
14 - 18	727	364	9.8	229	254	299	355	419	485	528	100	<3	
19 - 30	552	366	10.6	211	239	290	355	429	506	557	100	<3	
31 - 50	785	331	7.1	193	219	267	324	387	450	491	100	<3	
51 - 70	651	278	8.1	156	177	215	263	323	393	446	100	<3	
71+	392	233	5.4	137	157	192	232	272	308	332	100	<3	
19+	2380	316	5.3	172	197	244	303	373	448	500	100	<3	
Females:													
9 - 13	597	262	8.5	186	200	227	259	295	329	351	100	<3	
14 - 18	677	263	9.0	151	171	210	256	308	362	398	100	<3	
19 - 30	465	273	7.8	158	181	221	268	320	371	403	100	<3	
31 - 50	754	239	5.2	135	155	190	233	281	330	364	100	<3	
51 - 70	643	212	4.6	117	135	168	207	251	296	326	100	<3	
71+	405	189	4.2	122	135	158	186	217	247	267	100	<3	
19+	2267	232	3.3	127	146	181	225	275	326	361	100	<3	
All persons 1+	8940	274	2.7								100	<3	

* Standard error not displayed when percentage is <3 or >97 (Appendix C).

Source: What We Eat in America, NHANES 2001-2002, all individuals 1+ years, excludes breast-fed children and pregnant or lactating females. EAR from reference 6.

Table A17. Protein (g/kg body weight)[†]: Usual Intakes from Food, 2001-2002, Compared to Estimated Average Requirements

	N[‡]	Mean	SE	Percentiles							EAR	% Less Than EAR	SE[*]
				5	10	25	50	75	90	95			
Males and females:													
1 - 3	798	4.38	0.100	2.76	3.08	3.65	4.31	5.03	5.74	6.21	0.87	<3	
4 - 8	885	2.76	0.061	1.68	1.88	2.23	2.67	3.19	3.74	4.12	0.76	<3	
Males:													
9 - 13	566	2.00	0.070	1.16	1.32	1.61	1.95	2.32	2.74	3.03	0.76	<3	
14 - 18	717	1.42	0.051	0.87	0.97	1.15	1.38	1.64	1.92	2.01	0.73	<3	
19 - 30	535	1.38	0.053	0.88	0.97	1.15	1.36	1.59	1.82	1.99	0.66	<3	
31 - 50	767	1.35	0.029	0.89	0.98	1.13	1.32	1.54	1.76	1.91	0.66	<3	
51 - 70	629	1.17	0.041	0.72	0.80	0.94	1.13	1.35	1.60	1.78	0.66	<3	
71+	327	1.04	0.030	0.68	0.75	0.88	1.02	1.18	1.34	1.44	0.66	4	1.1
19+	2258	1.29	0.018	0.79	0.89	1.05	1.25	1.48	1.73	1.90	0.66	<3	
Females:													
9 - 13	587	1.53	0.045	0.87	0.97	1.18	1.46	1.81	2.18	2.42	0.76	<3	
14 - 18	666	1.13	0.029	0.56	0.66	0.84	1.08	1.36	1.65	1.85	0.71	14	1.9
19 - 30	457	1.15	0.036	0.65	0.75	0.91	1.12	1.35	1.57	1.72	0.66	5	1.7
31 - 50	735	1.12	0.025	0.68	0.76	0.91	1.08	1.29	1.51	1.66	0.66	4	1.1
51 - 70	623	1.01	0.018	0.63	0.71	0.84	1.00	1.17	1.35	1.46	0.66	7	1.1
71+	345	0.95	0.020	0.58	0.65	0.77	0.92	1.09	1.29	1.42	0.66	11	2.2
19+	2160	1.08	0.015	0.63	0.71	0.86	1.04	1.25	1.47	1.63	0.66	7	0.8
All persons 1+	8637	1.51	0.014									3[#]	

[†] For children 1-3 years, reference weight used (6). For individuals 4 years and older, actual body weight used if Body Mass Index (BMI) in healthy range; otherwise the weight that would place the individual at the nearest endpoint of the healthy range was used. Further details provided in Appendix B.

[‡] Excludes individuals 4 years and older without BMI available from NHANES 2001-2002 (13).

[*] Standard error not displayed when percentage is <3 or >97 (Appendix C).

[#] Percentage computed as weighted average of estimates for gender/age subgroups comprising the composite group. Standard error not displayed (Appendix C).

Source: What We Eat in America, NHANES 2001-2002, all individuals 1+ years, excludes breast-fed children and pregnant or lactating females. EAR from reference 6.

Section B. Tables

Usual Nutrient Intakes from Food, 2001-2002, Compared to Adequate Intakes

Table B18. Vitamin K (μg): Usual Intakes from Food, 2001-2002, Compared to Adequate Intakes

	N	Mean	SE	Percentiles							AI	% Greater Than AI	SE
				5	10	25	50	75	90	95			
Males and females:													
1 - 3	798	33.8	3.27	14	17	21	29	41	57	69	30	47	6.9
4 - 8	920	39.2	2.41	20	22	27	35	46	61	72	55	14	4.5
Males:													
9 - 13	574	52.0	5.11	28	32	38	48	61	75	87	60	27	10.5
14 - 18	727	56.6	3.57	27	31	40	52	68	88	102	75	18	4.8
19 - 30	552	63.5	5.06	48	50	56	63	70	78	83	120	<3	
31 - 50	785	87.8	6.01	44	50	63	82	106	132	151	120	15	4.9
51 - 70	651	105.5	7.99	28	35	50	81	134	206	265	120	30	3.9
71+	392	113.6	17.09	39	46	63	93	139	204	258	120	33	10.2
19+	2380	88.9	4.65	35	41	55	77	109	150	183	120	20	3.3
Females:													
9 - 13	597	39.9	2.57	21	24	30	37	47	58	68	60	9	4.4
14 - 18	677	51.9	3.78	25	29	37	48	62	81	93	75	13	5.4
19 - 30	465	70.3	12.47	21	25	35	52	83	133	179	90	22	7.6
31 - 50	754	92.9	9.08	30	37	52	77	114	167	211	90	39	6.0
51 - 70	643	109.3	7.36	43	51	68	95	134	185	224	90	54	5.2
71+	405	107.2	13.51	37	44	60	87	130	191	244	90	48	9.3
19+	2267	95.6	6.45	30	36	52	78	119	176	222	90	41	3.6
All persons 1+	8940	79.5	3.88									27[#]	

[#] Percentage computed as weighted average of estimates for gender/age subgroups comprising the composite group. Standard error not displayed (Appendix C).
Source: What We Eat in America, NHANES 2001-2002, all individuals 1+ years, excludes breast-fed children and pregnant or lactating females. AI from reference 4.

Table B19. Calcium (mg): Usual Intakes from Food, 2001-2002, Compared to Adequate Intakes

	N	Mean	SE	Percentiles							AI	% Greater Than AI	SE
				5	10	25	50	75	90	95			
Males and females:													
1 - 3	798	972	35.4	472	562	726	932	1172	1428	1602	500	94	1.5
4 - 8	920	960	28.7	551	626	760	929	1127	1332	1471	800	69	3.4
Males:													
9 - 13	574	1139	77.9	681	760	900	1086	1341	1584	1743	1300	28	10.5
14 - 18	727	1142	47.1	584	675	849	1094	1374	1658	1865	1300	31	5.3
19 - 30	552	1098	54.0	482	579	771	1034	1356	1701	1935	1000	53	4.6
31 - 50	785	1021	27.3	446	536	715	961	1261	1583	1802	1000	46	2.5
51 - 70	651	874	30.2	403	473	614	813	1066	1350	1551	1200	16	2.6
71+	392	817	33.2	376	445	580	771	1003	1248	1414	1200	12	2.5
19+	2380	984	22.7	423	508	678	914	1212	1544	1780		37[#]	
Females:													
9 - 13	597	865	36.2	492	558	680	837	1020	1208	1332	1300	6	1.8
14 - 18	677	804	42.9	336	407	552	753	999	1264	1446	1300	9	2.3
19 - 30	465	784	36.0	373	444	579	755	956	1162	1298	1000	21	3.7
31 - 50	754	755	29.4	414	470	579	722	895	1080	1206	1000	15	3.1
51 - 70	643	701	18.9	327	384	498	661	861	1069	1210	1200	5	1.1
71+	405	666	23.8	329	382	481	613	796	1011	1167	1200	4	1.2
19+	2267	735	18.4	360	421	538	696	889	1100	1245		12[#]	
All persons 1+	8940	892	16.7									30[#]	

[#] Percentage computed as weighted average of estimates for gender/age subgroups comprising the composite group. Standard error not displayed (Appendix C).
Source: What We Eat in America, NHANES 2001-2002, all individuals 1+ years, excludes breast-fed children and pregnant or lactating females. AI from reference 1.

Table B20. Potassium (mg): Usual Intakes from Food, 2001-2002, Compared to Adequate Intakes

	N	Mean	SE	Percentiles							AI	% Greater Than AI	SE*
				5	10	25	50	75	90	95			
Males and females:													
1 - 3	798	2086	46.6	1251	1414	1703	2044	2419	2806	3067	3000	6	1.1
4 - 8	920	2136	54.5	1332	1487	1763	2092	2466	2845	3081	3800	<3	
Males:													
9 - 13	574	2472	101.0	1593	1755	2051	2419	2831	3253	3535	4500	<3	
14 - 18	727	2774	103.2	1697	1893	2248	2694	3211	3752	4121	4700	<3	
19 - 30	552	3028	128.0	1722	1958	2388	2932	3564	4221	4660	4700	5	1.7
31 - 50	785	3280	69.4	2076	2314	2726	3219	3769	4328	4692	4700	5	1.2
51 - 70	651	3109	90.0	1764	1995	2431	2994	3651	4349	4837	4700	6	1.8
71+	392	2803	81.8	1499	1752	2202	2743	3338	3929	4311	4700	<3	
19+	2380	3141	54.9	1791	2040	2491	3049	3688	4354	4803	4700	6	0.9
Females:													
9 - 13	597	2125	79.1	1231	1379	1669	2054	2503	2964	3268	4500	<3	
14 - 18	677	2020	56.6	1107	1271	1573	1954	2389	2845	3157	4700	<3	
19 - 30	465	2139	64.3	1077	1271	1622	2063	2579	3114	3449	4700	<3	
31 - 50	754	2398	58.1	1358	1547	1892	2324	2822	3340	3688	4700	<3	
51 - 70	643	2468	62.0	1446	1643	1995	2419	2887	3354	3657	4700	<3	
71+	405	2208	59.4	1235	1411	1726	2111	2584	3118	3501	4700	<3	
19+	2267	2341	39.1	1276	1474	1830	2269	2772	3297	3651	4700	<3	
All persons 1+	8940	2606	33.4									<3#	

* Standard error not displayed when percentage is <3 or >97 (Appendix C).

Percentage computed as weighted average of estimates for gender/age subgroups comprising the composite group. Standard error not displayed (Appendix C).

Source: What We Eat in America, NHANES 2001-2002, all individuals 1+ years, excludes breast-fed children and pregnant or lactating females. AI from reference 5.

Table B21. Sodium (mg): Usual Intakes from Food, 2001-2002, Compared to Adequate Intakes

	N	Mean	SE	Percentiles							AI	% Greater Than AI	SE*
				5	10	25	50	75	90	95			
Males and females:													
1 - 3	798	2140	49.7	1144	1318	1648	2071	2554	3049	3379	1000	>97	
4 - 8	920	2831	55.7	1844	2025	2352	2761	3233	3727	4059	1200	>97	
Males:													
9 - 13	574	3549	124.0	2485	2692	3055	3495	3982	4474	4798	1500	>97	
14 - 18	727	4086	122.2	2682	2947	3424	4009	4664	5322	5752	1500	>97	
19 - 30	552	4141	130.5	2473	2782	3344	4045	4835	5628	6139	1500	>97	
31 - 50	785	4252	100.7	2567	2875	3441	4151	4951	5758	6283	1500	>97	
51 - 70	651	3645	103.8	2094	2360	2849	3478	4256	5131	5751	1300	>97	
71+	392	3051	111.5	1875	2112	2524	3011	3538	4044	4360	1200	>97	
19+	2380	3964	55.3	2251	2551	3111	3831	4666	5543	6139		>97#	
Females:													
9 - 13	597	2806	68.6	2009	2159	2426	2757	3135	3520	3770	1500	>97	
14 - 18	677	2799	76.3	1740	1934	2284	2727	3238	3758	4098	1500	>97	
19 - 30	465	3098	95.5	1707	1983	2448	3012	3668	4318	4741	1500	>97	
31 - 50	754	3011	93.1	1845	2053	2430	2907	3474	4094	4528	1500	>97	
51 - 70	643	2652	74.1	1715	1897	2219	2609	3038	3463	3737	1300	>97	
71+	405	2404	52.6	1658	1805	2062	2370	2709	3047	3267	1200	>97	
19+	2267	2853	46.6	1679	1894	2280	2759	3318	3921	4344		>97#	
All persons 1+	8940	3292	25.2									>97#	

* Standard error not displayed when percentage is <3 or >97 (Appendix C).

Percentage computed as weighted average of estimates for gender/age subgroups comprising the composite group. Standard error not displayed (Appendix C).

Source: What We Eat in America, NHANES 2001-2002, all individuals 1+ years, excludes breast-fed children and pregnant or lactating females. AI from reference 5.

Table B22. Dietary Fiber[†] (g): Usual Intakes from Food, 2001-2002, Compared to Adequate Intakes

	N	Mean	SE	Percentiles							AI[‡]	% Greater Than AI	SE[*]
				5	10	25	50	75	90	95			
Males and females:													
1 - 3	798	9.5	0.25	4.8	5.5	7.1	9.1	11.5	14.0	15.7	19	<3	
4 - 8	920	11.6	0.28	7.4	8.1	9.6	11.3	13.4	15.5	16.9	25	<3	
Males:													
9 - 13	574	14.2	0.51	10.0	10.8	12.2	14.0	15.9	17.8	19.0	31	<3	
14 - 18	727	15.3	0.53	8.1	9.3	11.6	14.6	18.3	22.2	24.9	38	<3	
19 - 30	552	17.2	0.78	8.1	9.6	12.4	16.1	20.8	26.0	29.7	38	<3	
31 - 50	785	18.6	0.68	9.9	11.4	14.2	17.8	22.2	26.9	30.1	38	<3	
51 - 70	651	17.8	0.67	8.3	9.7	12.6	16.6	21.7	27.4	31.5	30	6	1.6
71+	392	16.9	0.72	7.8	9.4	12.5	16.3	20.6	25.0	28.2	30	3	1.3
19+	2380	18.0	0.47	8.5	10.1	13.0	16.9	21.8	27.2	31.0		<3[#]	
Females:													
9 - 13	597	12.3	0.53	7.2	8.0	9.6	11.8	14.6	17.4	19.1	26	<3	
14 - 18	677	11.7	0.41	5.9	6.9	8.8	11.2	14.0	17.0	19.0	26	<3	
19 - 30	465	13.5	0.65	6.5	7.7	10.1	13.0	16.3	19.7	21.9	25	<3	
31 - 50	754	14.1	0.45	6.3	7.6	9.9	13.1	17.2	21.9	25.3	25	5	1.3
51 - 70	643	15.4	0.55	7.5	8.8	11.3	14.6	18.6	23.1	26.2	21	16	2.6
71+	405	13.7	0.58	7.2	8.3	10.4	13.0	16.3	20.0	22.6	21	8	1.9
19+	2267	14.3	0.33	6.7	8.0	10.4	13.5	17.3	21.6	24.6		8[#]	
All persons 1+	8940	15.1	0.28									4[#]	

[†] The intake of fiber is for dietary fiber only.

[‡] AI is for total fiber (dietary + functional). Therefore, the percentage greater than the AI may be underestimated.

[*] Standard error not displayed when percentage is <3 or >97 (Appendix C).

[#] Percentage computed as weighted average of estimates for gender/age subgroups comprising the composite group. Standard error not displayed (Appendix C).

Source: What We Eat in America, NHANES 2001-2002, all individuals 1+ years, excludes breast-fed children and pregnant or lactating females. AI from reference 6.

Table B23. Linoleic 18:2 (g): Usual Intakes from Food, 2001-2002, Compared to Adequate Intakes

	N	Mean	SE	Percentiles							AI	% Greater Than AI	SE
				5	10	25	50	75	90	95			
Males and females:													
1 - 3	798	7.7	0.21	4.3	4.9	6.0	7.5	9.2	11.0	12.2	7	58	3.4
4 - 8	920	11.0	0.30	7.1	7.8	9.1	10.7	12.6	14.5	15.8	10	61	4.6
Males:													
9 - 13	574	12.8	0.56	9.5	10.1	11.2	12.7	14.2	15.7	16.7	12	62	9.7
14 - 18	727	16.4	0.79	9.6	10.8	13.1	15.9	19.2	22.6	24.8	16	49	6.9
19 - 30	552	17.2	0.61	10.2	11.5	13.8	16.8	20.1	23.3	25.4	17	48	5.2
31 - 50	785	17.9	0.49	10.6	12.0	14.4	17.5	20.9	24.4	26.6	17	54	3.9
51 - 70	651	16.3	0.72	8.5	9.7	12.1	15.3	19.3	24.0	27.4	14	60	4.0
71+	392	13.1	0.66	7.1	8.1	10.0	12.6	15.6	18.8	21.0	14	37	6.1
19+	2380	16.8	0.32	9.0	10.4	12.9	16.2	20.0	24.0	26.8		53[#]	
Females:													
9 - 13	597	12.0	0.68	6.8	7.6	9.2	11.4	14.1	17.2	19.5	10	66	5.4
14 - 18	677	12.1	0.42	6.5	7.4	9.2	11.5	14.5	17.6	19.5	11	56	4.4
19 - 30	465	12.8	0.64	6.2	7.4	9.5	12.4	15.6	18.9	21.0	12	53	5.9
31 - 50	754	13.2	0.53	7.9	8.8	10.4	12.7	15.4	18.3	20.5	12	57	5.3
51 - 70	643	12.6	0.37	6.8	7.8	9.7	12.1	15.0	18.1	20.2	11	61	3.2
71+	405	10.9	0.32	6.1	6.9	8.4	10.4	12.8	15.4	17.1	11	43	3.9
19+	2267	12.7	0.29	6.7	7.7	9.6	12.1	15.1	18.4	20.8		56[#]	
All persons 1+	8940	14.0	0.17									56[#]	

[#] Percentage computed as weighted average of estimates for gender/age subgroups comprising the composite group. Standard error not displayed (Appendix C).
Source: What We Eat in America, NHANES 2001-2002, all individuals 1+ years, excludes breast-fed children and pregnant or lactating females. AI from reference 6.

Table B24. Linolenic 18:3[†] (g): Usual Intakes from Food, 2001-2002, Compared to Adequate Intakes

	N	Mean	SE	Percentiles							AI	% Greater Than AI	SE
				5	10	25	50	75	90	95			
Males and females:													
1 - 3	798	0.9	0.03	0.5	0.6	0.7	0.9	1.0	1.2	1.4	0.7	73	4.0
4 - 8	920	1.1	0.04	0.7	0.7	0.9	1.0	1.2	1.4	1.5	0.9	69	4.5
Males:													
9 - 13	574	1.3	0.06	0.9	1.0	1.1	1.2	1.4	1.6	1.7	1.2	58	9.8
14 - 18	727	1.6	0.09	1.0	1.1	1.3	1.6	1.9	2.3	2.5	1.6	49	8.2
19 - 30	552	1.7	0.06	1.1	1.3	1.5	1.7	2.0	2.3	2.5	1.6	61	6.0
31 - 50	785	1.8	0.05	1.0	1.1	1.4	1.7	2.2	2.6	2.8	1.6	60	3.2
51 - 70	651	1.7	0.07	0.9	1.0	1.2	1.6	2.0	2.5	2.9	1.6	48	4.5
71+	392	1.3	0.06	0.7	0.8	1.0	1.3	1.6	2.0	2.2	1.6	25	4.4
19+	2380	1.7	0.03	0.9	1.0	1.3	1.6	2.1	2.5	2.8	1.6	52	2.2
Females:													
9 - 13	597	1.1	0.06	0.7	0.8	0.9	1.1	1.3	1.5	1.7	1.0	59	6.2
14 - 18	677	1.2	0.05	0.6	0.7	0.9	1.2	1.5	1.8	2.0	1.1	55	4.5
19 - 30	465	1.2	0.04	0.6	0.7	0.9	1.2	1.5	1.8	2.0	1.1	57	4.2
31 - 50	754	1.3	0.06	0.8	0.9	1.0	1.3	1.6	1.9	2.1	1.1	68	5.1
51 - 70	643	1.3	0.05	0.7	0.8	1.0	1.2	1.6	1.9	2.2	1.1	63	3.8
71+	405	1.2	0.04	0.7	0.8	0.9	1.1	1.4	1.6	1.8	1.1	53	3.7
19+	2267	1.3	0.03	0.7	0.8	1.0	1.2	1.5	1.9	2.1	1.1	61	2.7
All persons 1+	8940	1.4	0.02									59#	

[†] The AI is specifically for the α-linolenic isomer (18:3 n-3 c,c,c). Intakes of linolenic 18:3 are for the undifferentiated fatty acid.

[#] Percentage computed as weighted average of estimates for gender/age subgroups comprising the composite group. Standard error not displayed (Appendix C).

Source: What We Eat in America, NHANES 2001-2002, all individuals 1+ years, excludes breast-fed children and pregnant or lactating females. AI from reference 6.

Section C. Tables

Proportion of Population with Usual Nutrient Intakes from Food Only, 2001-2002, Greater than Upper Tolerable Intake Levels

Table C25.1. Vitamin A (retinol), Folate (folic acid): Proportion of Population with Usual Intakes from Food, 2001-2002, Greater than Tolerable Upper Intake Level

	Retinol (μg)			Folic Acid (μg)		
	UL	% Greater Than UL	SE*	UL	% Greater Than UL	SE*
Males and females:						
1 - 3	600	12	3.0	300	5	1.4
4 - 8	900	<3		400	4	1.6
Males:						
9 - 13	1700	<3		600	<3	
14 - 18	2800	<3		800	<3	
19 - 30	3000	<3		1000	<3	
31 - 50	3000	<3		1000	<3	
51 - 70	3000	<3		1000	<3	
71+	3000	<3		1000	<3	
19+	3000	<3		1000	<3	
Females:						
9 - 13	1700	<3		600	<3	
14 - 18	2800	<3		800	<3	
19 - 30	3000	<3		1000	<3	
31 - 50	3000	<3		1000	<3	
51 - 70	3000	<3		1000	<3	
71+	3000	<3		1000	<3	
19+	3000	<3		1000	<3	
All persons 1+		<3#			<3#	

* Standard error not displayed when percentage is <3 or >97 (Appendix C).

Percentage computed as weighted average of estimates for gender/age subgroups comprising the composite group. Standard error not displayed (Appendix C).

Source: What We Eat in America, NHANES 2001-2002, all individuals 1+ years, excludes breast-fed children and pregnant or lactating females. UL from references 2, 4.

Table C25.2. Vitamin B_6, Vitamin C: Proportion of Population with Usual Intakes from Food, 2001-2002, Greater than Tolerable Upper Intake Level

	Vitamin B_6 (mg)			Vitamin C (mg)		
	UL	% Greater Than UL	SE*	UL	% Greater Than UL	SE*
Males and females:						
1 - 3	30	<3		400	<3	
4 - 8	40	<3		650	<3	
Males:						
9 - 13	60	<3		1200	<3	
14 - 18	80	<3		1800	<3	
19 - 30	100	<3		2000	<3	
31 - 50	100	<3		2000	<3	
51 - 70	100	<3		2000	<3	
71+	100	<3		2000	<3	
19+	100	<3		2000	<3	
Females:						
9 - 13	60	<3		1200	<3	
14 - 18	80	<3		1800	<3	
19 - 30	100	<3		2000	<3	
31 - 50	100	<3		2000	<3	
51 - 70	100	<3		2000	<3	
71+	100	<3		2000	<3	
19+	100	<3		2000	<3	
All persons 1+		<3#			<3#	

* Standard error not displayed when percentage is <3 or >97 (Appendix C).

Percentage computed as weighted average of estimates for gender/age subgroups comprising the composite group. Standard error not displayed (Appendix C).

Source: What We Eat in America, NHANES 2001-2002, all individuals 1+ years, excludes breast-fed children and pregnant or lactating females. UL from references 2, 3.

Table C25.3. Calcium, Phosphorus, Iron, Zinc: Proportion of Population with Usual Intakes from Food, 2001-2002, Greater than Tolerable Upper Intake Level

	Calcium (mg)			Phosphorus (mg)			Iron (mg)			Zinc (mg)		
	UL	% Greater Than UL	SE*	UL	% Greater Than UL	SE*	UL	% Greater Than UL	SE*	UL	% Greater Than UL	SE*
Males and females:												
1 - 3	2500	<3		3000	<3		40	<3		7	69	3.6
4 - 8	2500	<3		3000	<3		40	<3		12	22	3.8
Males:												
9 - 13	2500	<3		4000	<3		40	<3		23	<3	
14 - 18	2500	<3		4000	<3		45	<3		34	<3	
19 - 30	2500	<3		4000	<3		45	<3		40	<3	
31 - 50	2500	<3		4000	<3		45	<3		40	<3	
51 - 70	2500	<3		4000	<3		45	<3		40	<3	
71+	2500	<3		3000	<3		45	<3		40	<3	
19+	2500	<3			<3#		45	<3		40	<3	
Females:												
9 - 13	2500	<3		4000	<3		40	<3		23	<3	
14 - 18	2500	<3		4000	<3		45	<3		34	<3	
19 - 30	2500	<3		4000	<3		45	<3		40	<3	
31 - 50	2500	<3		4000	<3		45	<3		40	<3	
51 - 70	2500	<3		4000	<3		45	<3		40	<3	
71+	2500	<3		3000	<3		45	<3		40	<3	
19+	2500	<3			<3#		45	<3		40	<3	
All persons 1+	2500	<3			<3#			<3#			5#	

* Standard error not displayed when percentage is <3 or >97 (Appendix C).

Percentage computed as weighted average of estimates for gender/age subgroups comprising the composite group. Standard error not displayed (Appendix C).

Source: What We Eat in America, NHANES 2001-2002, all individuals 1+ years, excludes breast-fed children and pregnant or lactating females. UL from references 1, 4.

Table C25.4. Copper, Selenium, Sodium: Proportion of Population with Usual Intakes from Food, 2001-2002, Greater than Tolerable Upper Intake Level

	Copper (mg)			Selenium (µg)			Sodium (mg)		
	UL	% Greater Than UL	SE*	UL	% Greater Than UL	SE*	UL	% Greater Than UL	SE*
Males and females:									
1 - 3	1	15	2.0	90	8	1.6	1500	83	1.9
4 - 8	3	<3		150	<3		1900	94	1.1
Males:									
9 - 13	5	<3		280	<3		2200	>97	
14 - 18	8	<3		400	<3		2300	>97	
19 - 30	10	<3		400	<3		2300	97	0.9
31 - 50	10	<3		400	<3		2300	>97	
51 - 70	10	<3		400	<3		2300	91	1.3
71+	10	<3		400	<3		2300	84	3.3
19+	10	<3		400	<3		2300	94	0.6
Females:									
9 - 13	5	<3		280	<3		2200	88	2.3
14 - 18	8	<3		400	<3		2300	74	3.5
19 - 30	10	<3		400	<3		2300	81	3.3
31 - 50	10	<3		400	<3		2300	81	3.2
51 - 70	10	<3		400	<3		2300	70	4.2
71+	10	<3		400	<3		2300	56	4.4
19+	10	<3		400	<3		2300	74	2.1
All persons 1+		<3#			<3#			86#	

* Standard error not displayed when percentage is <3 or >97 (Appendix C).

Percentage computed as weighted average of estimates for gender/age subgroups comprising the composite group. Standard error not displayed (Appendix C).

Source: What We Eat in America, NHANES 2001-2002, all individuals 1+ years, excludes breast-fed children and pregnant or lactating females. UL from references 3-5.

Appendix A. Sample Counts and Weighted Population Estimates of What We Eat in America, NHANES 2001-2002

	Sample Count	Weighted Population Estimate (%)
Males and females:		
Under 1, breastfeeding	*158*	*0.5*
Under 1, not breastfeeding	*378*	*1.0*
1 – 3, breastfeeding	*24*	*0.1*
1 – 3, not breastfeeding	798	4.2
4 - 8	920	6.9
Males:		
9 - 13	574	3.8
14 - 18	727	3.8
19 - 30	552	8.0
31 - 50	785	15.5
51 - 70	651	8.5
71+	392	2.8
19+	2380	34.8
Females, not pregnant or lactating:		
9 - 13	597	3.8
14 - 18	677	3.4
19 - 30	465	7.6
31 - 50	754	14.5
51 - 70	643	9.4
71+	405	4.0
19+	2267	35.6
All persons 1+ used for report	8940	96.1
Females, pregnant or lactating:		
18 and younger	*35*	*0.1*
19 - 30	*252*	*1.6*
31 - 50	*96*	*0.6*
50 and younger	*383*	*2.3*
All ages with complete intakes	*9883*	*100.0*

Numbers and text in *italics* refer to respondents excluded from the analyses presented in this report.

Appendix B. Procedure for Usual Intake Estimation

Overview of the General Method for Usual Intake Estimation

The method and software used to estimate the usual nutrient intake distributions presented in this report were developed by Iowa State University (10) through a cooperative agreement with the Agricultural Research Service. The software, C-SIDE version 1.02, Software for Intake Distribution Estimation (12), was used to estimate the usual nutrient intake distributions and percentiles and to estimate the percentage of a population group with inadequate intakes based on the EAR, and with intakes at or greater than the AI or greater than the UL.

The following is a general summary of the usual intake estimation method as implemented by C-SIDE.

1. *Preliminary data adjustments*

Preliminary data adjustments include shifting observed intake data by a small amount away from zero, incorporating survey weights, and correcting for the effect of the sample day (Day 1 versus Day 2) on the mean and the variance of the distribution of observed intakes. Adjustment may also be made for differences in diet due to non-person specific effects such as seasonality or weekend-versus-weekday eating patterns.

2. *Transformation to normality*

Observed intake data (whether adjusted or not) generally have nonnormal distributions. For certain nutrients, skewness is quite extreme. Most statistical procedures rely on an assumption of normality. At this step the adjusted dietary intake data are transformed into normality. This is done in a two-step process. First, a power or log transformation is used to transform the data as close to normal as possible. Second, a nonparametric transformation, based on a grafted polynomial model, takes the power-transformed data into normality.

3. *Estimation of within- and between-individual variances in intakes*

A measurement error model is used, under the assumption of normality, to obtain estimates for the components of within- and between-individual variances. The variance components are used to estimate the distribution of usual intakes in the normal scale, which is assumed to exhibit only between-individual variation.

4. *Back-transformation into the original scale*

The final step is to transform the estimated usual intake distribution from the normal scale into the original scale. This inverse transformation ensures that the mean of the original intakes is retained in the usual intake distribution transformed back to the original scale.

The Process Used to Produce the Estimates in this Report

Introduction

The usual intake estimation procedure requires multiple days of nutrient intake data for at least a representative subsample of individuals in the group in order to separate the total variation in intake into within- and between-individual components. As described in the public release of WWEIA, NHANES 2001-2002 (8), dietary intakes were collected for two 24-hour periods beginning in 2002 while only one 24-hour intake per individual was collected in 2001. As a precaution to protect the confidentiality of survey participants, single-year data from NHANES are not released for public use. For that reason, only Day 1 interview data are included in the WWEIA, NHANES 2001-2002 release. Restricted data, such as the 2002 Day 2 dietary data, may be made available at the Research Data Center, National Center for Health Statistics, Hyattsville, MD (14), and were available to the authors of this report.

A two-step process was followed to produce the results presented in this report.

- **Step 1** Within-individual variances were estimated through the usual intake procedure for each nutrient and gender/age group using the 2-day intake data from 2002.

- **Step 2** The full set of day 1 intakes from WWEIA, NHANES 2001-2002 was analyzed with C-SIDE, using the variance components estimated from step 1 as additional inputs, to produce estimated usual intake distributions and to make comparisons to the DRIs.

Within-individual Variance Component Estimates

The within-individual variance component estimates produced in step 1 are available on the Food Surveys Research Group website at www.ars.usda.gov/foodsurvey so that analysts without access to the restricted data may still compute their own estimates of usual intake from WWEIA, NHANES 2001-2002 or from other data for which only one day of intake per person is available.

Computer and Programming Environment

All programs were run on a Sun UltraSparc II computer using the Solaris 8 version of the UNIX operating system with the exception of the generation of the sampling weights. C-SIDE version 1.02 was used for the usual intake estimation. C-SIDE has a window-based user interface but a batch approach was used for convenience as a separate run is necessary for each nutrient/population group combination. That is, separate C-SIDE programs were written and run in the background and the output directed to separate output files rather than interactively entering information for each run through the user interface. Note that it is possible to run multiple analyses within a single C-SIDE program but not easily under these circumstances where not all analyses use the same settings. Thus, each nutrient/population group combination was analyzed through a separate C-SIDE program.

SAS® version 8.2 (15) and file and data manipulation capabilities of UNIX were used to prepare the data files used as input for C-SIDE, generate the individual C-SIDE programs, control the running of the programs, compile the results from the individual program output files, and prepare the tables of statistics included in this report.

The sampling weights were calibrated and jackknife replicates were generated using WesVar® version 4.2 (16) on a personal computer running the Windows XP operating system.

Sampling Weights

The use of sampling weights is suggested when estimating usual intakes from WWEIA, NHANES 2001-2002 just as their use is suggested for other analyses of NHANES data. As with other large-scale surveys with a complex sample design, sampling weights may compensate for variable probabilities of selection, differential nonresponse rates, and possible deficiencies in the sampling frame. C-SIDE allows for the use of sampling weights in estimating usual intake statistics.

The basic sampling weights provided with NHANES data (known as MEC weights) are intended for the analysis of data collected at the Mobile Examination Center. The dietary intake data are collected at this level. As with most sampling weights for data from complex sample designs, the MEC weights were calculated from the base probabilities of selection, adjusted for nonresponse, and calibrated through poststratification to match population control totals. Poststratification is a process in which respondents are placed into non-overlapping categories, or poststratification cells, and their weights are adjusted so that the sums of the adjusted weights are equal to population totals within each cell.

For this report, the MEC weights were re-calibrated through poststratification to create sets of weights for only the subsets of individuals providing complete dietary intakes. The poststratification also included an adjustment for day of the week by assuming weekday intakes (Monday - Thursday) comprise $4/7^{ths}$ of all intakes and weekend intakes (Friday - Sunday) comprise $3/7^{ths}$ of all intakes. The weights used for step 1 were constructed by re-calibrating MEC weights originally constructed for the 2002 sample and the weights for step 2 were constructed by re-calibrating the MEC weights from the public release.

The poststratification cells and target counts used for both of these calibrations are provided in Appendix Table B1. The target counts were calculated by summing the original MEC weights for all examinees in the NHANES 2001-2002 data set within each of the poststratification cells. WesVar software was used to poststratify the weights.

The WesVar software was also used to construct jackknife replicate weights for step 2. C-SIDE can estimate standard errors of means or percentages using either a jackknife or a balanced repeated replication method. The standard errors of the mean and of the estimates of the percentage of individuals less than the EAR or at or greater than the AI or greater than the UL provided in this report were computed by a jackknife replication method using these weights.

The type of jackknife method used was the delete-one method, called JK1 in WesVar. This method places each unit into one of G subsets. Replicates are formed by deleting one group at a time and multiplying the weights for the other groups by the appropriate factor. For this report, the replicate groups were defined by the combination of the masked variance strata and PSUs from the demographics file (WTMVSTRA, WTMVPSU). There are 2 masked variance PSUs within each of 15 masked variance strata so a set of 30 JK1 replicate weights was constructed. The replicates were calibrated to the same population totals from Appendix Table B1 as the full-sample weight. Because within-individual variances were the only interest in step 1, it was not necessary to create a set of replicate weights from the 2002 sampling weights.

C-SIDE Application

A variety of parameters may be set for a C-SIDE analysis. Generally, the default settings were used for this analysis but modification to parameters affecting the transformation of the observed intakes to normality was necessary in some cases. Among the parameters controlling the transformation of the observed intakes to normality are the minimum number of join points referred to as MINJP, allowed when fitting a grafted polynomial function to a normal probability plot and the type I error rate (alpha in most statistics textbooks) used to test significance with an Anderson-Darling test for normality. In the C-SIDE programs this second parameter is identified as ADALPHA. The default value for ADALPHA is 0.15 and error rates of 0.10, 0.05, and 0.01 are also available. C-SIDE is designed to halt if the Anderson-Darling test fails at the significance level defined by ADALPHA although this feature may be overridden by setting ADALPHA = 0. It is less likely that intakes that are transformed by a transformation that fails the Anderson-Darling test at the default value of ADALPHA but do not fail at a lower value of ADALPHA come from a normal distribution.

The procedure followed for this report was to use the default value of ADALPHA = 0.15 unless the test failed. If that happened, ADALPHA was set to the next lower value for which the test did not fail and MINJP was set to the number of join points C-SIDE used in fitting the polynomial. This adjustment was necessary for a small percentage of the usual intake distributions estimated. Furthermore, it was found that some of the polynomial fits that required this modification in settings resulted in distributions with unstable variance estimates. For these, the minimum number of join points was lowered until a stable estimate was computed.

As part of the initial data adjustment, C-SIDE makes available a ratio adjustment to partially remove the effects of classification variables. This was applied for the day of the week variable through a CLASS statement although the primary adjustment for day of the week was made through the re-calibrated sampling weights.

The usual intake estimations of step 1 from 2002 two-day data used C-SIDE as described in the preceding paragraphs. The estimations of step 2 from 2001-2002 one-day data required two changes to normal use of C-SIDE to allow incorporation of the within-individual variance components estimated in step 1. First, because C-SIDE requires input data files to contain intake data for more than one day for at least some individuals, an input file was constructed that contained the full set of Day 1 intake data for all of the individuals included in the analysis, as well as a second set of the same intake data, but identified as having been collected on a second day. Applying C-SIDE to this data set in the normal manner would produce a zero estimate for the within-individual component of variance because the intake on the "second day" is the same as on the first for each individual. Therefore, the within-individual variance components were supplied as external inputs to C-SIDE using the parameter settings described below.

PEVCR	=	within-individual variance component from step 1	
NPEVCR	=	999999	(forces C-SIDE to use the external estimate of within-individual variance)
FXHETVAR	=	N	(turns off the correction for heterogeneous within-individual variances - necessary because of the duplicate Day 2 records in the input file)

The procedure for supplying external variance components to facilitate analysis of one-day data was provided by Dr. Kevin W. Dodd (17) at the National Cancer Institute, who was one of the developers of C-SIDE. The ability of C-SIDE to operate in this fashion is an undocumented feature of the software. Versions of C-SIDE later than 1.02 may use different settings to obtain the same behavior, and may expand on this functionality.

The replicate weights along with the full-sample weight were used so that standard errors of the mean and the percentages may be computed. The percentage less than or greater than a specified value and its standard error is requested in a RUN statement within a C-SIDE program. For this report, a separate program was used when a comparison to a UL was needed for an analysis that also included a comparison to an EAR or AI. The resulting estimates are included in the C-SIDE output listing.

Special Situation - Iron and the probability approach

The assumptions necessary for the use of the EAR cut-point method appear to be met for each of the nutrients analyzed with respect to an EAR with the exception of iron. It is expected that the distribution of requirements for menstruating females, and potentially other gender-age groups, is not normal or necessarily symmetric, and the process used to derive the EAR and the corresponding RDA for iron was therefore different than the process used for other nutrients. Essentially, the distribution of requirements was simulated through a Monte Carlo process and the EAR and RDA were derived from those distributions as the 50^{th} and 97.5th percentiles of the simulated distribution. (4)

Because of this asymmetry in the distribution of iron requirements, the probability approach (4, 7) rather than the EAR cut-point method was used for the analysis of iron intake. The implementation of this approach was possible because tables of the risk of inadequate intake for specified ranges of the usual intake of iron are provided in the IOM report on iron DRIs (4). The following summarizes how the use of the probability approach to compare intakes with the EAR was implemented for this report:

- C-SIDE was used to estimate the usual intake distribution as described above. In addition, a file containing the intake value at 499 evenly spaced percentiles was generated.

- Graphically, a plot of the percentile values approximates the density curve of the intake distribution. The area under the curve between two intake values on the x-axis is the percentage of the population with usual intake in that range.

- The probability of risk tables provide a risk associated with specified ranges of intake. If these ranges coincided with the points in the density curve it would be necessary simply to multiply the risk by the percentage of the population (i.e., area under the curve) for each range and sum the resulting products to estimate the total risk of inadequacy of intake.

- The endpoints of the ranges in the tables do not necessarily match the percentile values but density values for the range endpoints may be interpolated from the percentile values. This permits the calculation described above.

- The interpolation was made by assuming an approximation of the density curve by a straight line between two adjacent percentiles. The calculation of the area under the density curve was made by the trapezoid method.

- Standard errors were not produced for estimates made with the probability approach.

Special Situation – Protein-to-Body Weight Ratios

The EAR for protein is derived and stated in terms of grams of protein per kilogram of body weight as well as in grams of protein per day using reference body weights for each gender-age group (6). Using the cut point method, the distribution of protein to body weight ratios in the population (adjusted for usual intake) was compared to the EAR to determine the percentage of the population with inadequate protein intakes. The EAR was assumed to refer to ratios based on body weights falling within the healthy weight range. Thus, actual body weight was not used to compute an individual's protein-to-body weight ratio when it fell outside of the healthy range. Instead, the weight that would place the individual at the nearest endpoint of the healthy weight range was used as follows:

- For adults ages 19 years and older, body mass index (BMI) was used to define the healthy weight range. If an individual's BMI was below 18.5 or at or above 25.0, their actual weight was assumed to be outside of the healthy range. In this case, the weight that would place them at the nearest BMI cut point, given their height, was used instead of their actual weight in computing protein-to-body weight ratio.

- For children ages 4-18 years, a comparison to the 2000 CDC growth charts through the CDC BMI percentile program (18) was used to determine the healthy range. The healthy range for this age group is defined as the 5th to the 85th percentile of the appropriate growth curve. When the BMI was outside of this range, the weight that would place the respondent at the nearest endpoint given their height was used.

- For children ages 1-3 years, an exception was necessary because standing height (and thus BMI) was not available from NHANES for all children in this age group. For consistency, the protein to body weight ratio was computed as protein intake divided by 12 kg, the body weight of the reference person age 1-3 (6), for all children in this age range.

Not every WWEIA respondent ages 4 years and older has a value for BMI in the NHANES data set. The estimation of usual intake of protein in this report for gender/age groups comprised of persons 4 years of age or older excludes respondents without a BMI value in the NHANES data set.

Appendix Table B. Poststratification Cells and Target Counts for Re-calibrated Weights

					Population total
1	Male	0-19 years	Mexican American	Weekday	2,904,939
2	Male	0-19	Mexican American	Weekend	2,178,704
3	Male	0-19	Non-Hispanic black	Weekday	3,359,500
4	Male	0-19	Non-Hispanic black	Weekend	2,519,625
5	Male	0-19	Non-Hispanic white & others	Weekday	17,005,126
6	Male	0-19	Non-Hispanic white & others	Weekend	12,753,844
7	Male	20+	Mexican American	Weekday	4,283,657
8	Male	20+	Mexican American	Weekend	3,212,742
9	Male	20+	Non-Hispanic black	Weekday	5,476,377
10	Male	20+	Non-Hispanic black	Weekend	4,107,282
11	Male	20+	Non-Hispanic white & others	Weekday	44,743,375
12	Male	20+	Non-Hispanic white & others	Weekend	33,557,531
13	Female	0-19	Mexican American	Weekday	2,791,892
14	Female	0-19	Mexican American	Weekend	2,093,919
15	Female	0-19	Non-Hispanic black	Weekday	3,259,022
16	Female	0-19	Non-Hispanic black	Weekend	2,444,266
17	Female	0-19	Non-Hispanic white & others	Weekday	16,608,978
18	Female	0-19	Non-Hispanic white & others	Weekend	12,456,733
19	Female	20+	Mexican American	Weekday	3,904,890
20	Female	20+	Mexican American	Weekend	2,928,668
21	Female	20+	Non-Hispanic black	Weekday	6,996,282
22	Female	20+	Non-Hispanic black	Weekend	5,247,211
23	Female	20+	Non-Hispanic white & others	Weekday	48,650,413
24	Female	20+	Non-Hispanic white & others	Weekend	36,487,810
	Total				279,972,786

Appendix C. Explanation of Table Footnotes

Footnote # Separate Usual Nutrient Intake Calculations.
A separate usual nutrient intake calculation was made for each row of data in each of the tables. Mean, standard error of the mean (SEM), percentile estimates, as well as estimates of percentages less than or greater than the DRI and the standard error of the percentage are the direct result of an estimation of the usual nutrient intake distribution for that specific gender/age group. Exceptions were necessary for composite groups where the DRI value differs across the component groups. These exceptions include:

> **Composite Age Groups of 19+ Years for Males and Females.** Where the DRI values differ across the composite age groups of 19+ years for males and/or females, the estimated percentage less than or greater than the DRI value was computed as an average of the percentages for the gender/age subgroups comprising the composite group weighted proportionally by population size. In such a case, no standard error is provided and the estimated percentage is noted with the symbol #. This computation was necessary for vitamin $B_{6,}$ magnesium, iron, zinc, linoleic acid, dietary fiber, calcium, and sodium.
>
> **Composite Group of All Persons 1+ Years.** Percentiles of estimated usual intakes for the composite group of persons 1+ years are not presented. The percentage of individuals less than or greater than the DRI was computed as a weighted average as with adults 19+ years. As with the 19+ age groups, no standard error is provided and the estimated percentage is noted with the symbol #.

Footnote * Values for Percentages At The Extremes and Their Standard Errors.
The percentages less than or greater than DRIs that are less than 3 percent are represented by <3. The percentages that are greater than 97 percent are represented by >97. Standard errors are not displayed in these cases and the column header is marked with *.

Appendix D. References

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