

Isoflavones & Lignans (so-called Phytoestrogens)

Phytoestrogens are naturally occurring polycyclic phenols found in certain plants that may, when ingested and metabolized, have weak estrogenic effects. Two important groups of phytoestrogens are isoflavones and lignans. The isoflavones considered in this report are daidzein, genistein, O-desmethylangolensin (ODMA), and equol. The lignans considered in this report are enterodiol and enterolactone.

Plant sources of isoflavones include legumes, with the largest contribution coming from soy-based foods. Since soy flour and soy protein isolates may be added to processed meats, meat substitutes, breads, and protein-food bars, these items can be a major source of isoflavones (Grace 2004; Lampe 1999). However, the isoflavone content of soy protein preparations can vary widely and is affected by production techniques (Erdman 2004). Daidzein and genistein are the main soy isoflavones. Kudzu root, used in some dietary supplements, also contains appreciable amounts of daidzein. Naringenin, a precursor to genistein, is found in some citrus fruits. Formononetin and biochanin A are methylated isoflavones found in clovers, which may be used in red clover dietary supplements, and they are metabolized in the body to daidzein and genistein, respectively. Ingested daidzein is further metabolized to ODMA and to equol by intestinal bacteria. Equol, but not ODMA, has estrogenic activity. About 30 percent of adults produce equol and have higher serum equol concentrations after they consume daidzein (Setchell 2003a; Cassidy 2006). This ability to produce equol may be related to an individual's intestinal microflora and influenced by dietary habits (Rowland 2000; Setchell 2006). It is unclear whether the ability to produce equol results in any health-related effects (Vafeiadou 2006).

Lignans include matairesinol and secoisolariciresinol, which are transformed by intestinal bacteria into the estrogenic compounds, enterolactone, and enterodiol, respectively (Cornwell 2004; Rowland 2003). Enterodiol may also convert into enterolactone and vice versa. Lignans are found in flax seeds, whole wheat flour, tea, some fruits, and other cereal grains.



Diet is the source of human exposure to phytoestrogens. The absorption and metabolism of phytoestrogens varies considerably among individuals, which may relate to differences in absorption, enterohepatic circulation, and metabolism by intestinal bacteria. Phytoestrogens are ingested in their naturally occurring *beta*-glycosidic forms. The *beta*-glycosidic forms are hydrolyzed to their aglycones in the intestine, absorbed, and then linked in the intestinal wall and liver with glucuronic acid to make them more water-soluble, a process known as glucuronidation (Doerge 2000; Rowland 2003). The glucuronidated metabolites of isoflavones predominate in blood and urine (Setchell 2001).

Isoflavones are excreted from the body within about 24 hours after ingestion, mainly in urine and, to a lesser extent, in feces (Setchell 2001). Urinary concentrations of daidzein and genistein may not correlate well with the ingested doses, perhaps because of the limited absorption of these isoflavones at higher doses (Setchell 2003b). In contrast, lignan concentrations in plasma and urine concentrations after flax seed consumption increases in a dose-dependent manner (Nesbitt 1999). Equol excretion may depend on diet, the type of intestinal bacteria present, and individual genetic factors (Rowland 2000; Setchell 2002; Setchell 1999).

Generally, phytoestrogens are much less potent than endogenously produced estrogens, but phytoestrogens can be present in much greater quantities (100 to 1000 times the concentration of endogenous estrogens). Additionally, phytoestrogens bind less tightly to steroid-hormone serum-transport proteins than do endogenous estrogens (Nagel 1998). Equol has more potent estrogen activity than its precursor daidzein and has been proposed to be most important in explaining the mechanism of action of isoflavones in disease prevention (Setchell 2002).

In comparison with Western diets, Asian diets typically provide higher intakes of soy-based foods. Some have suggested that the higher isoflavone intake in Asian diets may account for the lower incidence among Asians of menopause-related symptoms and for other associated beneficial health outcomes, such as reduced risk for breast, prostate, and colon cancer; cardiovascular health; and modulation of osteoporosis. A recent evidence report from the Agency for Healthcare Research and Quality (Balk 2005) about the effects of soy on health outcomes reported that there is no conclusive evidence of a dose-response effect of either soy protein or isoflavone on cardiovascular diseases, menopausal symptoms, endocrine function, cancer, bone health, reproductive health, kidney diseases, cognitive function, or glucose metabolism. For reducing low-density lipoprotein concentrations, however, soy protein could possibly have a dose-response effect.

soy vs iodine

Adverse effects on fertility have been observed in animals that graze on red clover. Results of chronic feeding studies in pregnant animals suggest that high doses of

phytoestrogens alter the fetal hormonal environment (Cornwell 2004). Infants who consume soy-based formula can have plasma concentrations of isoflavones that are 13,000–22,000 times higher than concentrations of endogenous estrogen in infants (Setchell 1997). Yet, studies of children who had been fed soy-based formula as infants and who were followed through adolescence (Klein 1998) and young adulthood (Strom 2001) found no adverse reproductive or endocrine effects. In vitro and animal studies also suggest that soy isoflavones may have immunologic and thyroid effects (Doerge 2002). The Center for the Evaluation of Risks to Human Reproduction of the National Toxicology Program reviewed the developmental and reproductive toxicity of both soy formula and genistein and concluded that available data were inadequate to determine the effects of soy formula on developmental or reproductive toxicity (Rozman 2006a). The expert review panel expressed negligible concern for adverse effects in the general population of consuming dietary sources of genistein: under current exposure conditions, adults would be unlikely to consume sufficient daily levels of genistein to cause adverse reproductive and/or developmental effects (Rozman 2006b).

For more information about soy isoflavones, see the fact sheet from the National Institutes of Health, Office of Dietary Supplements (http://ods.od.nih.gov/Health_Information/Information_About_Individual_Dietary_Supplements.aspx).

Phytoestrogens have been measured in NHANES since 1999. In NHANES 1999–2000, CDC scientists detected enterolactone in the highest concentration, and daidzein was detected with the highest frequency among the six measured phytoestrogens (Valentin-Blasini 2005). CDC's Third National Report on Human Exposure to Environmental Chemicals has presented geometric means and selected percentiles (50th, 75th, 90th, and 95th) for concentrations of phytoestrogens by age, sex, and race/ethnicity for participants in NHANES 1999–2000 and 2001–2002 (U.S. Centers for Disease Control and Prevention 2005).



Chemist verifies sample for phytoestrogen analysis.

Selected Observations and Highlights

The following example observations are taken from the uncorrected tables of 1999–2002 data contained in this report. Statements about categorical differences between demographic groups noted below are based on non-overlapping confidence limits from univariate analysis without adjusting for demographic variables (i.e., age, sex, race/ethnicity) or other determinants of these urine concentrations (i.e., dietary intake, supplement usage, smoking, BMI). A multivariate analysis may alter the size and statistical significance of these categorical differences. Furthermore, additional significant differences of smaller magnitude may be present despite their lack of mention here (e.g., if confidence limits slightly overlap or if differences are not statistically significant before covariate adjustment has occurred). For a selection of citations of descriptive NHANES papers related to these biochemical indicators of diet and nutrition, see Appendix E.

General Observations

- Urinary isoflavone (genistein, daidzein, equol, and ODMA) concentrations are generally lower in adults than they are in children and adolescents, whereas urinary lignan concentrations either do not differ by age (enterodiols) or show a U-shaped age pattern (enterolactone).
- Males and females have similar phytoestrogen concentrations.
- Non-Hispanic whites have higher equol concentrations than non-Hispanic blacks and Mexican Americans. Mexican Americans have lower ODMA concentrations than non-Hispanic blacks and non-Hispanic whites.

Highlights

Urinary isoflavone and lignan concentrations show only small variations by demographic variables such as age, sex, or race/ethnicity.



Table 5.1.a. Urinary genistein: Total population

Geometric mean and selected percentiles of urine concentrations (in µg/L) for the total U.S. population aged 6 years and older, National Health and Nutrition Examination Survey, 1999–2002.

| | Geometric mean (95% conf. interval) | Selected percentiles (95% conf. interval) | | | Sample size |
|--------------------------|--|---|------------------|---------------|-------------|
| | | 10th | 50th | 90th | |
| Males and Females | | | | | |
| Total, 6 years and older | 28.5 (25.5-31.8) | 3.27 (2.70-4.17) | 28.4 (25.7-30.7) | 293 (253-330) | 5351 |
| 6–11 years | 33.8 (29.3-39.1) | 5.80 (4.20-7.05) | 31.8 (25.2-37.3) | 248 (197-328) | 727 |
| 12–19 years | 38.0 (32.2-44.7) | 5.60 (4.00-8.20) | 34.8 (29.0-41.4) | 314 (249-365) | 1498 |
| 20–39 years | 31.3 (26.5-37.0) | 3.10 (2.40-4.80) | 29.0 (25.8-34.3) | 349 (269-437) | 1140 |
| 40–59 years | 23.7 (19.1-29.3) | 2.22 (1.90-3.40) | 24.4 (21.3-29.4) | 298 (202-402) | 951 |
| 60 years and older | 24.1 (20.8-28.0) | 2.90 (2.20-3.95) | 24.2 (20.3-29.8) | 227 (155-308) | 1035 |
| Males | | | | | |
| Total, 6 years and older | 31.1 (26.8-36.2) | 3.86 (3.10-5.20) | 30.3 (27.6-34.0) | 298 (235-341) | 2597 |
| 6–11 years | 34.6 (27.6-43.3) | 5.36 (3.30-7.04) | 35.2 (24.3-51.0) | 218 (146-348) | 368 |
| 12–19 years | 36.3 (28.1-46.8) | 6.21 (2.62-10.6) | 31.0 (25.6-41.4) | 299 (204-363) | 736 |
| 20–39 years | 33.5 (26.5-42.3) | 3.16 (2.30-5.39) | 30.7 (26.8-35.9) | 385 (245-522) | 500 |
| 40–59 years | 26.5 (19.7-35.6) | 3.35 (1.32-5.60) | 28.4 (20.1-35.7) | 281 (195-383) | 480 |
| 60 years and older | 29.8 (24.4-36.6) | 4.17 (3.10-5.73) | 31.1 (23.7-36.6) | 233 (141-335) | 513 |
| Females | | | | | |
| Total, 6 years and older | 26.1 (23.7-28.8) | 2.85 (2.22-3.83) | 25.6 (23.5-28.4) | 285 (242-353) | 2754 |
| 6–11 years | 33.1 (26.2-41.9) | 5.50 (3.75-7.84) | 27.0 (21.8-36.1) | 272 (197-426) | 359 |
| 12–19 years | 39.8 (34.0-46.7) | 5.52 (4.00-8.40) | 36.8 (31.3-46.3) | 321 (247-445) | 762 |
| 20–39 years | 29.3 (24.0-35.8) | 2.99 (1.95-4.86) | 27.6 (22.5-36.3) | 312 (217-461) | 640 |
| 40–59 years | 21.2 (17.3-26.1) | 1.60 (<LOD-3.00) | 22.8 (18.7-26.0) | 327 (194-495) | 471 |
| 60 years and older | 20.5 (17.3-24.3) | 2.50 (1.26-3.51) | 20.3 (16.4-25.3) | 190 (129-290) | 522 |

< LOD means less than the limit of detection, which may vary for some compounds by year. See Appendix D for LOD.

Table 5.1.b. Urinary genistein: Mexican Americans

Geometric mean and selected percentiles of urine concentrations (in µg/L) for Mexican Americans in the U.S. population aged 6 years and older, National Health and Nutrition Examination Survey, 1999–2002.

| | Geometric mean (95% conf. interval) | Selected percentiles (95% conf. interval) | | | Sample size |
|--------------------------|--|---|------------------|-----------------|-------------|
| | | 10th | 50th | 90th | |
| Males and Females | | | | | |
| Total, 6 years and older | 29.7 (25.4-34.8) | 4.07 (3.40-4.60) | 27.4 (23.5-32.5) | 294 (216-328) | 1498 |
| 6–11 years | 37.5 (26.3-53.4) | 3.78 (1.64-6.00) | 42.6 (22.7-63.5) | 432 (220-671) | 226 |
| 12–19 years | 32.4 (26.6-39.4) | 3.80 (2.50-5.40) | 34.2 (27.7-41.1) | 314 (216-367) | 543 |
| 20–39 years | 30.7 (22.8-41.3) | 4.50 (3.40-5.70) | 25.8 (18.5-37.5) | 302 (201-427) | 301 |
| 40–59 years | 24.8 (19.7-31.1) | 3.60 (2.08-5.62) | 25.7 (18.5-34.4) | 168 (106-286) | 221 |
| 60 years and older | 20.3 (16.5-25.0) | 2.48 (1.06-4.07) | 19.0 (13.7-31.1) | 190 (113-489) | 207 |
| Males | | | | | |
| Total, 6 years and older | 33.6 (26.0-43.4) | 4.28 (3.10-5.40) | 31.6 (24.1-45.0) | 324 (294-432) | 724 |
| 6–11 years | 37.7 (23.6-60.3) | 3.30 (1.40-7.80) | 42.8 (22.4-63.5) | 341 (172-830) | 117 |
| 12–19 years | 34.0 (26.5-43.7) | 3.67 (2.09-5.70) | 39.7 (26.4-54.2) | 324 (216-373) | 276 |
| 20–39 years | 37.3 (23.9-58.2) | 4.50 (2.70-7.05) | 32.3 (19.1-72.9) | 406 (244-514) | 127 |
| 40–59 years | 28.7 (20.9-39.4) | 4.40† (2.80-8.30) | 29.0 (19.5-38.9) | 205† (97.3-540) | 105 |
| 60 years and older | 19.1 (12.5-29.4) | 2.48† (<LOD-6.30) | 16.9 (11.2-31.1) | 125† (57.0-614) | 99 |
| Females | | | | | |
| Total, 6 years and older | 26.0 (23.0-29.4) | 3.80 (3.18-4.38) | 24.4 (20.7-26.9) | 220 (193-309) | 774 |
| 6–11 years | 37.2 (23.9-57.8) | 4.60† (<LOD-7.20) | 27.4 (19.3-84.7) | 523† (220-813) | 109 |
| 12–19 years | 30.6 (23.4-40.1) | 3.94 (2.00-6.11) | 30.2 (25.0-38.1) | 267 (166-492) | 267 |
| 20–39 years | 24.3 (19.0-31.2) | 4.32 (3.18-6.30) | 20.0 (14.6-26.9) | 215 (125-349) | 174 |
| 40–59 years | 21.3 (15.8-28.6) | 2.95 (<LOD-5.62) | 24.2 (17.0-34.4) | 146 (87.3-286) | 116 |
| 60 years and older | 21.4 (14.9-30.6) | 1.90† (<LOD-3.80) | 23.5 (10.9-38.9) | 213† (128-489) | 108 |

< LOD means less than the limit of detection, which may vary for some compounds by year. See Appendix D for LOD.
† Estimate is subject to greater uncertainty due to small cell size.

Table 5.1.c. Urinary genistein: Non-Hispanic blacks

Geometric mean and selected percentiles of urine concentrations (in µg/L) for non-Hispanic blacks in the U.S. population aged 6 years and older, National Health and Nutrition Examination Survey, 1999–2002.

| | Geometric mean (95% conf. interval) | Selected percentiles (95% conf. interval) | | | Sample size |
|--------------------------|--|---|------------------|-----------------|-------------|
| | | 10th | 50th | 90th | |
| Males and Females | | | | | |
| Total, 6 years and older | 31.5 (25.2-39.3) | 3.73 (2.40-5.00) | 33.2 (26.8-41.5) | 328 (237-393) | 1289 |
| 6–11 years | 42.3 (32.8-54.4) | 4.70 (3.50-6.90) | 43.7 (32.4-58.0) | 417 (272-600) | 249 |
| 12–19 years | 46.7 (37.7-57.9) | 7.20 (5.84-10.0) | 39.5 (34.4-48.0) | 378 (306-467) | 451 |
| 20–39 years | 31.7 (22.9-43.8) | 3.70 (1.60-6.30) | 34.9 (25.4-49.1) | 301 (164-474) | 197 |
| 40–59 years | 24.3 (16.3-36.4) | 1.90 (<LOD-5.20) | 27.9 (18.5-39.7) | 246 (114-402) | 210 |
| 60 years and older | 24.6 (16.8-36.0) | 2.79 (1.20-5.40) | 23.7 (15.4-34.7) | 228 (137-641) | 182 |
| Males | | | | | |
| Total, 6 years and older | 33.5 (24.7-45.6) | 4.60 (2.30-7.21) | 36.9 (28.8-49.1) | 257 (178-388) | 628 |
| 6–11 years | 45.0 (31.5-64.5) | 4.96 (3.33-7.05) | 49.6 (34.6-73.9) | 387 (205-687) | 127 |
| 12–19 years | 45.8 (36.6-57.4) | 7.00 (4.72-10.2) | 43.0 (34.6-56.7) | 334 (227-445) | 212 |
| 20–39 years | 30.2 (18.1-50.6) | 3.80† (<LOD-8.30) | 41.5 (24.0-57.2) | 252† (104-513) | 91 |
| 40–59 years | 26.7 (16.3-44.0) | 3.70† (<LOD-10.0) | 30.1 (16.6-50.4) | 178† (87.4-367) | 109 |
| 60 years and older | 33.2 (18.3-60.1) | 4.70† (<LOD-7.96) | 30.3 (15.9-58.6) | 276† (108-1120) | 89 |
| Females | | | | | |
| Total, 6 years and older | 29.8 (24.0-37.1) | 3.00 (2.10-4.40) | 30.3 (23.3-38.2) | 363 (245-472) | 661 |
| 6–11 years | 39.4 (29.0-53.6) | 4.74 (1.70-9.70) | 34.5 (24.7-50.8) | 432 (203-600) | 122 |
| 12–19 years | 47.7 (35.9-63.4) | 7.54 (5.90-11.2) | 37.4 (29.6-47.6) | 394 (233-717) | 239 |
| 20–39 years | 32.8 (22.5-47.8) | 2.99† (<LOD-8.40) | 34.4 (21.0-50.7) | 346† (161-577) | 106 |
| 40–59 years | 22.4 (14.0-35.9) | 1.50† (<LOD-4.40) | 23.3 (17.1-38.6) | 285† (106-495) | 101 |
| 60 years and older | 20.2 (13.1-31.1) | 2.30† (<LOD-5.42) | 17.4 (10.6-33.3) | 228† (105-641) | 93 |

< LOD means less than the limit of detection, which may vary for some compounds by year. See Appendix D for LOD.
† Estimate is subject to greater uncertainty due to small cell size.

Table 5.1.d. Urinary genistein: Non-Hispanic whites

Geometric mean and selected percentiles of urine concentrations (in µg/L) for non-Hispanic whites in the U.S. population aged 6 years and older, National Health and Nutrition Examination Survey, 1999–2002.

| | Geometric mean (95% conf. interval) | Selected percentiles (95% conf. interval) | | | Sample size |
|--------------------------|--|---|------------------|----------------|-------------|
| | | 10th | 50th | 90th | |
| Males and Females | | | | | |
| Total, 6 years and older | 27.1 (24.2-30.4) | 2.96 (2.40-3.91) | 26.5 (23.9-29.5) | 281 (238-330) | 2112 |
| 6–11 years | 31.3 (25.2-38.9) | 6.40 (4.20-8.15) | 28.4 (22.4-37.3) | 217 (155-272) | 196 |
| 12–19 years | 36.4 (29.3-45.3) | 5.10 (3.30-9.70) | 33.3 (27.9-41.0) | 257 (209-331) | 375 |
| 20–39 years | 30.5 (24.0-38.7) | 2.80 (1.92-4.86) | 27.9 (23.7-34.0) | 387 (254-537) | 529 |
| 40–59 years | 23.9 (18.6-30.6) | 2.14 (<LOD-3.40) | 24.3 (19.7-29.5) | 335 (214-466) | 434 |
| 60 years and older | 22.2 (19.0-26.0) | 2.74 (1.71-3.98) | 22.5 (18.7-27.9) | 182 (129-282) | 578 |
| Males | | | | | |
| Total, 6 years and older | 30.6 (26.1-35.9) | 3.90 (2.80-5.60) | 29.5 (26.5-33.1) | 293 (226-371) | 1038 |
| 6–11 years | 31.0 (22.9-42.0) | 6.20† (3.10-8.15) | 32.9 (20.6-48.3) | 190† (104-257) | 101 |
| 12–19 years | 33.2 (22.9-48.1) | 5.09 (2.20-11.5) | 28.3 (22.8-38.8) | 238 (141-371) | 190 |
| 20–39 years | 32.2 (23.7-43.8) | 2.90 (1.90-5.91) | 27.9 (23.7-34.3) | 413 (229-734) | 231 |
| 40–59 years | 29.1 (21.7-39.1) | 3.42 (1.32-5.85) | 28.7 (21.7-38.7) | 298 (195-447) | 225 |
| 60 years and older | 28.9 (23.0-36.4) | 4.17 (3.10-6.00) | 29.8 (21.9-36.7) | 229 (129-335) | 291 |
| Females | | | | | |
| Total, 6 years and older | 24.1 (21.6-27.0) | 2.59 (1.50-3.20) | 23.7 (20.9-26.1) | 268 (226-353) | 1074 |
| 6–11 years | 31.7 (21.7-46.3) | 6.89† (3.51-10.2) | 26.7 (17.3-37.9) | 256† (131-500) | 95 |
| 12–19 years | 40.4 (33.6-48.6) | 5.10 (3.51-9.13) | 37.8 (29.0-53.2) | 305 (212-446) | 185 |
| 20–39 years | 28.9 (21.6-38.8) | 2.59 (1.40-4.90) | 27.0 (18.7-39.0) | 330 (206-626) | 298 |
| 40–59 years | 19.6 (14.5-26.6) | .960 (<LOD-2.87) | 18.7 (14.3-24.9) | 355 (174-627) | 209 |
| 60 years and older | 18.1 (14.8-22.1) | 2.20 (1.00-3.75) | 18.4 (14.1-24.3) | 136 (118-202) | 287 |

< LOD means less than the limit of detection, which may vary for some compounds by year. See Appendix D for LOD.
† Estimate is subject to greater uncertainty due to small cell size.

Table 5.1.e. Urinary genistein: Total population (creatinine corrected)

Geometric mean and selected percentiles of urine concentrations (in µg/g creatinine) for the total U.S. population aged 6 years and older, National Health and Nutrition Examination Survey, 1999–2002.

| | Geometric mean (95% conf. interval) | Selected percentiles (95% conf. interval) | | | Sample size |
|--------------------------|--|---|------------------|---------------|-------------|
| | | 10th | 50th | 90th | |
| Males and Females | | | | | |
| Total, 6 years and older | 26.6 (23.7-29.8) | 3.78 (3.08-4.46) | 24.8 (22.5-27.6) | 242 (209-274) | 5351 |
| 6–11 years | 36.7 (31.1-43.4) | 6.94 (5.22-8.13) | 34.9 (27.6-41.3) | 243 (186-292) | 727 |
| 12–19 years | 27.5 (23.3-32.4) | 4.36 (3.68-5.09) | 24.4 (20.9-30.8) | 192 (153-258) | 1498 |
| 20–39 years | 25.1 (21.5-29.2) | 3.77 (2.96-4.59) | 22.8 (19.1-26.3) | 244 (202-318) | 1140 |
| 40–59 years | 23.8 (19.3-29.3) | 2.48 (1.17-4.08) | 22.3 (18.5-28.7) | 270 (196-335) | 951 |
| 60 years and older | 28.9 (25.4-33.0) | 4.48 (3.17-5.31) | 26.6 (22.4-32.3) | 222 (175-285) | 1035 |
| Males | | | | | |
| Total, 6 years and older | 25.0 (21.4-29.3) | 4.02 (3.25-4.74) | 23.0 (19.8-26.8) | 203 (177-265) | 2597 |
| 6–11 years | 36.5 (28.4-46.8) | 6.65 (4.52-8.13) | 35.4 (27.1-50.3) | 200 (154-286) | 368 |
| 12–19 years | 25.8 (20.4-32.5) | 4.23 (3.54-5.09) | 22.2 (18.6-31.7) | 164 (115-264) | 736 |
| 20–39 years | 23.3 (18.4-29.4) | 4.01 (1.99-5.04) | 19.0 (15.6-24.7) | 227 (170-330) | 500 |
| 40–59 years | 22.0 (16.1-30.0) | 3.21 (1.36-4.87) | 21.0 (16.1-30.9) | 222 (167-334) | 480 |
| 60 years and older | 28.0 (23.6-33.2) | 4.74 (3.44-6.19) | 27.1 (22.2-33.1) | 177 (143-324) | 513 |
| Females | | | | | |
| Total, 6 years and older | 28.1 (25.3-31.3) | 3.50 (2.95-4.23) | 26.6 (23.8-29.7) | 265 (230-308) | 2754 |
| 6–11 years | 37.0 (28.2-48.6) | 7.69 (4.92-9.64) | 30.9 (21.9-47.9) | 255 (182-488) | 359 |
| 12–19 years | 29.3 (24.9-34.6) | 4.65 (3.09-6.00) | 28.2 (23.2-33.2) | 216 (162-304) | 762 |
| 20–39 years | 27.0 (22.4-32.5) | 3.32 (3.01-4.41) | 25.8 (21.1-30.3) | 265 (192-349) | 640 |
| 40–59 years | 25.6 (21.2-30.8) | 2.23 (<LOD-3.81) | 24.7 (17.6-36.0) | 287 (230-381) | 471 |
| 60 years and older | 29.7 (24.8-35.5) | 4.27 (2.52-5.68) | 26.6 (21.6-35.0) | 252 (191-319) | 522 |

< LOD means less than the limit of detection for the uncorrected urine value, which may vary for some compounds by year. See Appendix D for LOD.

Table 5.1.f. Urinary genistein: Mexican Americans (creatinine corrected)

Geometric mean and selected percentiles of urine concentrations (in µg/g creatinine) for Mexican Americans in the U.S. population aged 6 years and older, National Health and Nutrition Examination Survey, 1999–2002.

| | Geometric mean (95% conf. interval) | Selected percentiles (95% conf. interval) | | | Sample size |
|--------------------------|--|---|------------------|-----------------|-------------|
| | | 10th | 50th | 90th | |
| Males and Females | | | | | |
| Total, 6 years and older | 27.6 (24.1-31.6) | 3.85 (3.35-4.65) | 24.5 (19.7-30.0) | 243 (208-279) | 1498 |
| 6–11 years | 48.0 (37.4-61.6) | 5.98 (3.95-8.12) | 42.4 (31.7-62.9) | 601 (317-717) | 226 |
| 12–19 years | 25.5 (21.4-30.4) | 3.42 (2.96-4.23) | 24.6 (19.7-31.7) | 188 (165-254) | 543 |
| 20–39 years | 25.3 (19.5-32.9) | 3.79 (3.16-5.11) | 19.1 (14.8-32.6) | 215 (181-257) | 301 |
| 40–59 years | 24.8 (19.9-31.0) | 4.01 (2.88-5.44) | 25.6 (18.6-32.8) | 176 (124-279) | 221 |
| 60 years and older | 23.4 (18.4-29.6) | 3.49 (1.13-5.08) | 22.1 (15.8-35.0) | 216 (142-329) | 207 |
| Males | | | | | |
| Total, 6 years and older | 27.7 (22.5-34.1) | 4.01 (3.10-5.17) | 25.7 (18.7-34.9) | 228 (190-285) | 724 |
| 6–11 years | 45.3 (30.6-66.9) | 4.29 (2.85-9.69) | 40.7 (29.1-66.8) | 627 (206-776) | 117 |
| 12–19 years | 25.6 (20.3-32.3) | 3.62 (2.22-4.66) | 24.7 (18.3-40.4) | 185 (165-270) | 276 |
| 20–39 years | 27.5 (18.7-40.3) | 3.99 (2.72-5.71) | 19.8 (13.5-41.2) | 226 (180-323) | 127 |
| 40–59 years | 24.1 (17.7-32.8) | 4.91† (3.21-6.44) | 25.6 (14.8-34.3) | 159† (96.9-335) | 105 |
| 60 years and older | 18.0 (12.2-26.6) | 3.05† (<LOD-5.74) | 18.5 (10.8-32.4) | 135† (50.5-292) | 99 |
| Females | | | | | |
| Total, 6 years and older | 27.5 (24.0-31.4) | 3.72 (3.27-4.42) | 23.8 (19.2-26.2) | 253 (195-324) | 774 |
| 6–11 years | 51.0 (37.5-69.4) | 7.40† (<LOD-9.57) | 44.0 (25.1-94.3) | 537† (253-926) | 109 |
| 12–19 years | 25.5 (19.4-33.4) | 3.42 (2.71-4.65) | 24.5 (16.1-36.3) | 195 (131-313) | 267 |
| 20–39 years | 23.0 (18.2-29.1) | 3.60 (3.20-4.61) | 16.8 (13.8-25.5) | 205 (119-325) | 174 |
| 40–59 years | 25.6 (19.8-33.2) | 3.17 (<LOD-5.96) | 24.4 (17.5-33.6) | 219 (121-324) | 116 |
| 60 years and older | 29.0 (19.9-42.2) | 3.50† (<LOD-11.2) | 27.9 (14.7-59.2) | 237† (142-408) | 108 |

< LOD means less than the limit of detection for the uncorrected urine value, which may vary for some compounds by year. See Appendix D for LOD.
† Estimate is subject to greater uncertainty due to small cell size.

Table 5.1.g. Urinary genistein: Non-Hispanic blacks (creatinine corrected)

Geometric mean and selected percentiles of urine concentrations (in µg/g creatinine) for non-Hispanic blacks in the U.S. population aged 6 years and older, National Health and Nutrition Examination Survey, 1999–2002.

| | Geometric mean (95% conf. interval) | Selected percentiles (95% conf. interval) | | | Sample size |
|--|--|---|------------------|-----------------|-------------|
| | | 10th | 50th | 90th | |
| Males and Females | | | | | |
| Total, 6 years and older | 21.2 (17.0-26.4) | 3.24 (2.52-4.26) | 21.1 (17.2-26.1) | 192 (154-239) | 1289 |
| 6–11 years | 39.5 (31.0-50.4) | 5.59 (3.92-9.81) | 38.5 (28.9-51.2) | 279 (203-409) | 249 |
| 12–19 years | 26.2 (21.4-32.1) | 4.25 (3.54-5.18) | 24.9 (20.0-30.8) | 224 (138-351) | 451 |
| 20–39 years | 18.0 (12.8-25.3) | 2.82 (3.44-4.26) | 19.0 (13.4-25.6) | 186 (95.1-281) | 197 |
| 40–59 years | 16.4 (11.4-23.7) | 2.56 (<LOD-4.68) | 16.4 (11.5-23.7) | 152 (101-217) | 210 |
| 60 years and older | 23.1 (17.0-31.5) | 4.13 (2.22-5.31) | 20.9 (14.9-30.9) | 178 (106-384) | 182 |
| Males | | | | | |
| Total, 6 years and older | 20.3 (15.1-27.3) | 3.24 (1.99-4.68) | 20.7 (16.4-28.5) | 162 (109-222) | 628 |
| 6–11 years | 41.8 (29.2-59.7) | 5.47 (3.10-12.9) | 41.3 (28.5-71.2) | 274 (165-450) | 127 |
| 12–19 years | 25.0 (20.1-31.0) | 3.12 (1.84-5.01) | 26.1 (20.0-34.8) | 176 (114-260) | 212 |
| 20–39 years | 14.7 (8.72-24.7) | 2.82† (<LOD-5.12) | 17.2 (10.1-25.6) | 103† (53.9-191) | 91 |
| 40–59 years | 16.3 (10.0-26.5) | 2.56† (<LOD-5.14) | 18.7 (10.4-30.4) | 112† (49.6-236) | 109 |
| 60 years and older | 24.7 (14.3-42.4) | 4.86† (<LOD-7.14) | 20.4 (14.7-32.8) | 322† (74.5-783) | 89 |
| Females | | | | | |
| Total, 6 years and older | 22.1 (17.9-27.1) | 3.33 (2.58-4.15) | 21.6 (16.5-26.9) | 224 (159-317) | 661 |
| 6–11 years | 37.3 (28.2-49.4) | 5.59 (2.77-9.59) | 31.6 (21.3-54.0) | 344 (185-462) | 122 |
| 12–19 years | 27.6 (21.0-36.2) | 5.14 (4.13-6.43) | 22.9 (16.6-32.3) | 261 (130-460) | 239 |
| 20–39 years | 21.2 (14.5-31.1) | 3.01† (<LOD-5.56) | 23.3 (13.5-30.3) | 247† (140-415) | 106 |
| 40–59 years | 16.5 (10.9-25.0) | 2.22† (<LOD-4.89) | 14.3 (10.6-25.0) | 154† (109-247) | 101 |
| 60 years and older | 22.1 (15.5-31.6) | 3.95† (<LOD-5.45) | 20.0 (13.1-33.8) | 178† (90.2-446) | 93 |
| < LOD means less than the limit of detection for the uncorrected urine value, which may vary for some compounds by year. See Appendix D for LOD. | | | | | |
| † Estimate is subject to greater uncertainty due to small cell size. | | | | | |

Table 5.1.h. Urinary genistein: Non-Hispanic whites (creatinine corrected)

Geometric mean and selected percentiles of urine concentrations (in µg/g creatinine) for non-Hispanic whites in the U.S. population aged 6 years and older, National Health and Nutrition Examination Survey, 1999–2002.

| | Geometric mean (95% conf. interval) | Selected percentiles (95% conf. interval) | | | Sample size |
|--|--|---|------------------|----------------|-------------|
| | | 10th | 50th | 90th | |
| Males and Females | | | | | |
| Total, 6 years and older | 27.0 (24.1-30.2) | 3.80 (2.98-4.66) | 25.6 (22.7-28.8) | 242 (207-284) | 2112 |
| 6–11 years | 34.0 (26.7-43.3) | 7.20 (4.92-10.4) | 31.7 (23.3-40.8) | 186 (145-279) | 196 |
| 12–19 years | 27.6 (22.0-34.7) | 4.76 (2.77-6.72) | 24.1 (20.6-33.0) | 166 (130-232) | 375 |
| 20–39 years | 26.6 (21.7-32.5) | 3.89 (2.96-4.86) | 24.4 (17.5-31.5) | 268 (208-348) | 529 |
| 40–59 years | 25.0 (19.6-31.9) | 2.47 (<LOD-4.07) | 24.2 (18.1-33.2) | 287 (204-367) | 434 |
| 60 years and older | 27.7 (24.4-31.4) | 4.63 (2.98-6.09) | 26.0 (21.9-32.0) | 185 (150-274) | 578 |
| Males | | | | | |
| Total, 6 years and older | 25.9 (22.1-30.4) | 4.35 (3.66-5.13) | 24.6 (20.6-29.3) | 196 (169-284) | 1038 |
| 6–11 years | 34.1 (24.7-47.1) | 6.08† (2.28-11.9) | 35.3 (18.9-60.1) | 168† (115-279) | 101 |
| 12–19 years | 25.2 (17.9-35.5) | 4.35 (2.76-6.73) | 21.0 (17.0-29.6) | 124 (95.4-264) | 190 |
| 20–39 years | 24.5 (18.3-32.7) | 4.48 (1.42-5.71) | 19.5 (14.8-28.4) | 246 (170-365) | 231 |
| 40–59 years | 24.5 (17.9-33.5) | 3.32 (1.55-5.13) | 22.0 (16.3-35.8) | 271 (167-379) | 225 |
| 60 years and older | 27.6 (23.4-32.7) | 4.85 (3.73-6.59) | 26.8 (20.5-34.3) | 170 (111-285) | 291 |
| Females | | | | | |
| Total, 6 years and older | 28.1 (25.0-31.6) | 3.16 (2.45-4.27) | 26.6 (22.5-31.3) | 274 (230-323) | 1074 |
| 6–11 years | 33.9 (22.4-51.4) | 7.69† (4.25-11.6) | 27.6 (17.4-41.1) | 200† (140-571) | 95 |
| 12–19 years | 30.5 (24.3-38.4) | 4.74 (2.59-7.08) | 29.8 (21.7-40.1) | 203 (141-304) | 185 |
| 20–39 years | 28.8 (22.6-36.7) | 3.20 (2.63-4.86) | 27.0 (19.6-37.3) | 283 (206-357) | 298 |
| 40–59 years | 25.5 (19.2-34.0) | 1.62 (<LOD-4.07) | 24.2 (15.6-40.4) | 323 (220-480) | 209 |
| 60 years and older | 27.8 (22.5-34.2) | 4.27 (2.00-6.44) | 25.9 (19.9-35.0) | 222 (155-319) | 287 |
| < LOD means less than the limit of detection for the uncorrected urine value, which may vary for some compounds by year. See Appendix D for LOD. | | | | | |
| † Estimate is subject to greater uncertainty due to small cell size. | | | | | |

Table 5.2.a. Urinary daidzein: Total population

Geometric mean and selected percentiles of urine concentrations (in µg/L) for the total U.S. population aged 6 years and older, National Health and Nutrition Examination Survey, 1999–2002.

| | Geometric mean (95% conf. interval) | Selected percentiles (95% conf. interval) | | | Sample size |
|--------------------------|--|---|------------------|----------------|-------------|
| | | 10th | 50th | 90th | |
| Males and Females | | | | | |
| Total, 6 years and older | 61.0 (55.2-67.3) | 6.75 (5.68-8.00) | 59.2 (54.0-66.6) | 545 (491-642) | 5347 |
| 6–11 years | 88.1 (78.0-99.4) | 15.6 (13.0-19.7) | 80.2 (68.2-108) | 544 (446-726) | 726 |
| 12–19 years | 89.7 (73.2-110) | 10.9 (7.50-16.5) | 87.5 (74.3-103) | 786 (569-1090) | 1497 |
| 20–39 years | 63.7 (55.6-73.1) | 6.59 (5.20-8.10) | 57.3 (49.9-70.6) | 590 (494-781) | 1138 |
| 40–59 years | 52.3 (43.4-63.1) | 5.62 (2.90-7.81) | 53.9 (44.2-63.0) | 505 (397-725) | 951 |
| 60 years and older | 44.8 (38.9-51.6) | 4.80 (2.00-6.70) | 44.6 (38.7-54.2) | 394 (300-519) | 1035 |
| Males | | | | | |
| Total, 6 years and older | 64.8 (57.2-73.4) | 7.29 (5.62-9.40) | 63.0 (57.2-70.9) | 542 (470-694) | 2595 |
| 6–11 years | 95.6 (77.5-118) | 19.1 (14.4-20.3) | 83.6 (56.3-139) | 544 (443-745) | 368 |
| 12–19 years | 87.4 (65.2-117) | 12.0 (6.72-18.7) | 87.5 (71.0-118) | 660 (445-1100) | 735 |
| 20–39 years | 64.4 (53.6-77.3) | 6.50 (4.00-11.4) | 57.0 (48.2-69.8) | 663 (494-935) | 499 |
| 40–59 years | 54.8 (43.2-69.4) | 5.70 (3.50-7.81) | 58.1 (49.5-68.4) | 467 (332-774) | 480 |
| 60 years and older | 54.2 (44.6-65.9) | 4.89 (2.60-8.70) | 57.9 (43.3-78.7) | 414 (300-576) | 513 |
| Females | | | | | |
| Total, 6 years and older | 57.5 (51.9-63.7) | 6.41 (5.00-8.00) | 56.0 (49.3-62.0) | 553 (459-702) | 2752 |
| 6–11 years | 80.7 (66.0-98.8) | 13.7 (11.3-19.7) | 76.6 (62.3-106) | 524 (390-989) | 358 |
| 12–19 years | 92.1 (75.4-112) | 10.4 (6.10-16.5) | 89.7 (70.2-115) | 922 (642-1330) | 762 |
| 20–39 years | 63.1 (51.3-77.7) | 7.18 (4.70-8.40) | 58.1 (48.2-79.2) | 517 (411-987) | 639 |
| 40–59 years | 50.2 (40.5-62.1) | 4.40 (1.86-8.22) | 46.1 (37.8-61.0) | 591 (364-1220) | 471 |
| 60 years and older | 38.7 (32.8-45.7) | 4.40 (1.80-6.97) | 37.4 (32.0-43.6) | 356 (280-461) | 522 |

Table 5.2.b. Urinary daidzein: Mexican Americans

Geometric mean and selected percentiles of urine concentrations (in µg/L) for Mexican Americans in the U.S. population aged 6 years and older, National Health and Nutrition Examination Survey, 1999–2002.

| | Geometric mean (95% conf. interval) | Selected percentiles (95% conf. interval) | | | Sample size |
|--------------------------|--|---|------------------|-----------------|-------------|
| | | 10th | 50th | 90th | |
| Males and Females | | | | | |
| Total, 6 years and older | 55.9 (45.6-68.6) | 5.10 (2.41-6.76) | 52.5 (43.8-67.4) | 618 (513-824) | 1495 |
| 6–11 years | 81.7 (56.7-118) | 10.2 (4.39-14.0) | 74.5 (43.4-123) | 866 (534-1240) | 225 |
| 12–19 years | 71.6 (61.0-84.1) | 8.50 (6.30-11.4) | 74.6 (56.5-98.5) | 595 (475-915) | 543 |
| 20–39 years | 51.9 (36.3-74.2) | 3.50 (<LOD-6.82) | 47.1 (29.7-68.6) | 585 (406-931) | 299 |
| 40–59 years | 46.8 (35.3-62.2) | 3.20 (<LOD-6.90) | 53.9 (35.8-71.4) | 584 (297-980) | 221 |
| 60 years and older | 35.1 (24.7-49.8) | 1.96 (<LOD-7.99) | 36.3 (27.1-47.3) | 366 (182-635) | 207 |
| Males | | | | | |
| Total, 6 years and older | 62.7 (45.6-86.2) | 5.20 (1.80-8.41) | 62.9 (45.8-85.0) | 745 (515-994) | 723 |
| 6–11 years | 91.4 (61.1-137) | 12.7 (4.37-26.6) | 84.3 (50.0-123) | 896 (505-1240) | 117 |
| 12–19 years | 74.9 (57.6-97.4) | 7.50 (4.33-11.7) | 81.0 (55.8-117) | 664 (498-1100) | 276 |
| 20–39 years | 61.9 (37.0-104) | 2.40 (<LOD-9.60) | 57.6 (30.1-108) | 706 (446-1070) | 126 |
| 40–59 years | 52.5 (33.6-82.1) | 5.03† (<LOD-11.2) | 56.0 (33.5-92.5) | 872† (331-1090) | 105 |
| 60 years and older | 29.1 (16.5-51.3) | < LOD† | 31.6 (18.2-47.3) | 284† (106-659) | 99 |
| Females | | | | | |
| Total, 6 years and older | 49.4 (41.1-59.4) | 5.40 (1.70-7.52) | 45.9 (35.7-54.0) | 522 (388-682) | 772 |
| 6–11 years | 72.8 (43.9-121) | 6.59† (<LOD-12.5) | 60.6 (29.5-195) | 824† (514-1420) | 108 |
| 12–19 years | 68.1 (57.5-80.8) | 9.70 (6.30-11.8) | 69.0 (48.5-93.2) | 541 (299-1440) | 267 |
| 20–39 years | 42.2 (28.9-61.6) | 4.30 (<LOD-10.7) | 35.4 (26.3-51.4) | 450 (324-669) | 173 |
| 40–59 years | 41.5 (28.4-60.6) | < LOD | 50.1 (26.2-71.4) | 302 (213-800) | 116 |
| 60 years and older | 41.0 (25.7-65.5) | 2.70† (<LOD-11.2) | 37.4 (22.8-76.8) | 370† (170-804) | 108 |

< LOD means less than the limit of detection, which may vary for some compounds by year. See Appendix D for LOD.
† Estimate is subject to greater uncertainty due to small cell size.

Table 5.2.c. Urinary daidzein: Non-Hispanic blacks

Geometric mean and selected percentiles of urine concentrations (in µg/L) for non-Hispanic blacks in the U.S. population aged 6 years and older, National Health and Nutrition Examination Survey, 1999–2002.

| | Geometric mean (95% conf. interval) | Selected percentiles (95% conf. interval) | | | Sample size |
|--------------------------|--|---|------------------|-----------------|-------------|
| | | 10th | 50th | 90th | |
| Males and Females | | | | | |
| Total, 6 years and older | 76.1 (62.0-93.4) | 8.10 (5.45-11.1) | 88.4 (68.8-106) | 628 (491-906) | 1288 |
| 6–11 years | 120 (95.7-151) | 12.5 (8.61-17.9) | 135 (99.1-172) | 1130 (628-1850) | 249 |
| 12–19 years | 119 (98.9-144) | 15.1 (10.6-20.4) | 118 (98.1-148) | 950 (660-1370) | 450 |
| 20–39 years | 77.7 (56.4-107) | 9.50 (3.00-12.2) | 91.3 (58.1-149) | 578 (363-1330) | 197 |
| 40–59 years | 58.7 (40.0-86.2) | 6.05 (<LOD-12.1) | 66.1 (41.5-96.3) | 529 (393-816) | 210 |
| 60 years and older | 45.2 (29.3-69.9) | 1.90 (<LOD-6.60) | 44.7 (26.5-70.9) | 556 (377-1140) | 182 |
| Males | | | | | |
| Total, 6 years and older | 78.3 (56.9-108) | 8.98 (<LOD-14.2) | 90.4 (65.6-122) | 632 (489-1040) | 627 |
| 6–11 years | 142 (104-194) | 16.4 (11.3-24.2) | 161 (94.9-244) | 1360 (597-1850) | 127 |
| 12–19 years | 123 (101-150) | 14.9 (10.5-21.1) | 142 (104-183) | 1030 (650-1320) | 211 |
| 20–39 years | 74.4 (45.4-122) | 8.45† (<LOD-15.0) | 86.4 (42.6-198) | 582† (305-1340) | 91 |
| 40–59 years | 52.3 (29.5-92.9) | 5.80† (<LOD-16.4) | 65.5 (31.2-117) | 358† (233-594) | 109 |
| 60 years and older | 55.7 (28.3-110) | < LOD† | 58.1 (31.0-104) | 519† (377-1960) | 89 |
| Females | | | | | |
| Total, 6 years and older | 74.2 (61.5-89.6) | 7.70 (3.61-11.3) | 85.9 (66.6-103) | 611 (473-856) | 661 |
| 6–11 years | 100 (70.3-144) | 10.0 (<LOD-26.2) | 107 (79.6-152) | 1130 (467-2300) | 122 |
| 12–19 years | 115 (88.3-151) | 15.2 (6.80-24.8) | 106 (85.2-129) | 805 (545-1840) | 239 |
| 20–39 years | 80.4 (57.7-112) | 9.50† (2.80-14.3) | 98.0 (58.7-155) | 465† (331-1400) | 106 |
| 40–59 years | 64.8 (44.8-93.5) | 5.70† (<LOD-13.6) | 68.8 (37.7-101) | 541† (393-1170) | 101 |
| 60 years and older | 39.4 (23.9-64.8) | 2.30† (<LOD-5.45) | 33.9 (21.6-61.6) | 560† (267-1140) | 93 |

< LOD means less than the limit of detection, which may vary for some compounds by year. See Appendix D for LOD.
† Estimate is subject to greater uncertainty due to small cell size.

Table 5.2.d. Urinary daidzein: Non-Hispanic whites

Geometric mean and selected percentiles of urine concentrations (in µg/L) for non-Hispanic whites in the U.S. population aged 6 years and older, National Health and Nutrition Examination Survey, 1999–2002.

| | Geometric mean (95% conf. interval) | Selected percentiles (95% conf. interval) | | | Sample size |
|--------------------------|--|---|------------------|-----------------|-------------|
| | | 10th | 50th | 90th | |
| Males and Females | | | | | |
| Total, 6 years and older | 58.4 (53.0-64.3) | 6.60 (5.33-8.10) | 56.2 (51.5-61.0) | 505 (439-636) | 2112 |
| 6–11 years | 83.8 (69.3-101) | 16.5 (13.0-20.3) | 76.6 (58.9-112) | 443 (385-694) | 196 |
| 12–19 years | 84.2 (62.7-113) | 9.60 (4.93-16.9) | 85.3 (68.3-119) | 755 (493-1310) | 375 |
| 20–39 years | 62.0 (52.1-73.8) | 6.59 (4.00-9.20) | 52.1 (44.3-65.5) | 601 (437-987) | 529 |
| 40–59 years | 54.7 (44.4-67.5) | 5.70 (3.16-8.00) | 54.8 (44.8-62.3) | 508 (393-852) | 434 |
| 60 years and older | 41.5 (35.3-48.9) | 5.00 (2.00-7.70) | 41.7 (36.9-50.6) | 337 (235-416) | 578 |
| Males | | | | | |
| Total, 6 years and older | 63.4 (55.9-71.9) | 7.77 (5.80-10.1) | 59.0 (53.2-69.8) | 505 (418-667) | 1038 |
| 6–11 years | 86.4 (62.7-119) | 20.2† (13.0-26.6) | 77.7 (43.8-155) | 470† (317-694) | 101 |
| 12–19 years | 79.2 (50.9-123) | 11.1 (3.70-19.2) | 76.9 (53.0-121) | 586 (354-1300) | 190 |
| 20–39 years | 59.7 (48.0-74.3) | 5.30 (2.00-12.0) | 48.9 (37.3-66.9) | 663 (362-1410) | 231 |
| 40–59 years | 62.4 (50.6-76.9) | 6.30 (5.20-10.1) | 58.4 (49.8-71.1) | 501 (322-838) | 225 |
| 60 years and older | 53.1 (42.5-66.3) | 5.20 (2.90-10.0) | 57.2 (42.3-78.2) | 377 (273-570) | 291 |
| Females | | | | | |
| Total, 6 years and older | 54.0 (48.2-60.4) | 6.20 (3.63-7.77) | 52.0 (44.8-59.2) | 505 (432-705) | 1074 |
| 6–11 years | 81.0 (59.0-111) | 13.7† (11.6-22.0) | 76.6 (58.9-121) | 466† (284-1130) | 95 |
| 12–19 years | 90.3 (67.4-121) | 9.30 (3.80-18.9) | 90.5 (68.3-140) | 922 (566-1410) | 185 |
| 20–39 years | 64.3 (49.0-84.4) | 6.70 (3.63-9.30) | 56.2 (43.1-79.2) | 530 (369-1300) | 298 |
| 40–59 years | 48.1 (35.4-65.4) | 3.16 (<LOD-10.1) | 45.0 (35.4-64.2) | 638 (220-1370) | 209 |
| 60 years and older | 34.3 (27.8-42.3) | 3.60 (<LOD-7.08) | 34.6 (28.5-41.1) | 262 (190-398) | 287 |

< LOD means less than the limit of detection, which may vary for some compounds by year. See Appendix D for LOD.
† Estimate is subject to greater uncertainty due to small cell size.

Table 5.2.e. Urinary daidzein: Total population (creatinine corrected)

Geometric mean and selected percentiles of urine concentrations (in µg/g creatinine) for the total U.S. population aged 6 years and older, National Health and Nutrition Examination Survey, 1999–2002.

| | Geometric mean (95% conf. interval) | Selected percentiles (95% conf. interval) | | | Sample size |
|--------------------------|--|---|------------------|---------------|-------------|
| | | 10th | 50th | 90th | |
| Males and Females | | | | | |
| Total, 6 years and older | 56.9 (51.4-63.0) | 6.67 (5.54-8.00) | 56.3 (50.0-64.0) | 536 (460-600) | 5347 |
| 6–11 years | 95.6 (83.2-110) | 18.4 (14.3-21.2) | 88.9 (73.4-112) | 635 (494-733) | 726 |
| 12–19 years | 64.8 (52.3-80.3) | 8.03 (5.73-10.4) | 63.4 (50.0-86.2) | 600 (402-797) | 1497 |
| 20–39 years | 51.1 (44.8-58.3) | 5.91 (4.85-7.32) | 48.8 (41.2-57.7) | 523 (390-624) | 1138 |
| 40–59 years | 52.6 (43.7-63.2) | 5.54 (3.58-7.49) | 51.0 (43.3-65.4) | 535 (391-689) | 951 |
| 60 years and older | 53.7 (46.4-62.1) | 6.01 (3.90-8.62) | 55.5 (43.5-71.3) | 389 (308-555) | 1035 |
| Males | | | | | |
| Total, 6 years and older | 52.1 (45.8-59.3) | 5.96 (5.05-7.39) | 51.0 (45.2-59.7) | 497 (373-601) | 2595 |
| 6–11 years | 101 (80.4-127) | 22.7 (14.5-30.1) | 88.8 (58.6-143) | 553 (447-733) | 368 |
| 12–19 years | 62.0 (47.2-81.5) | 9.03 (6.10-10.4) | 61.6 (48.6-85.6) | 547 (301-921) | 735 |
| 20–39 years | 44.8 (36.8-54.7) | 5.36 (3.66-7.20) | 41.2 (33.1-47.9) | 497 (268-847) | 499 |
| 40–59 years | 45.5 (35.9-57.6) | 5.05 (3.28-7.38) | 45.2 (32.0-65.0) | 478 (263-693) | 480 |
| 60 years and older | 50.9 (41.8-62.0) | 4.52 (3.09-7.91) | 61.8 (44.2-81.0) | 363 (255-659) | 513 |
| Females | | | | | |
| Total, 6 years and older | 61.9 (55.4-69.1) | 7.18 (5.91-9.10) | 61.0 (53.3-70.4) | 564 (468-628) | 2752 |
| 6–11 years | 90.3 (72.6-112) | 14.9 (11.9-19.0) | 86.3 (70.8-112) | 668 (414-838) | 358 |
| 12–19 years | 67.9 (54.6-84.3) | 6.80 (5.25-9.92) | 65.1 (48.1-91.9) | 628 (478-742) | 762 |
| 20–39 years | 58.1 (47.6-70.9) | 6.74 (3.67-9.55) | 56.2 (45.0-78.2) | 571 (370-783) | 639 |
| 40–59 years | 60.3 (48.0-75.8) | 6.58 (3.42-9.23) | 62.4 (43.2-75.6) | 564 (387-950) | 471 |
| 60 years and older | 56.0 (47.2-66.3) | 6.52 (4.52-11.4) | 50.9 (39.3-64.8) | 451 (312-560) | 522 |

Table 5.2.f. Urinary daidzein: Mexican Americans (creatinine corrected)

Geometric mean and selected percentiles of urine concentrations (in µg/g creatinine) for Mexican Americans in the U.S. population aged 6 years and older, National Health and Nutrition Examination Survey, 1999–2002.

| | Geometric mean (95% conf. interval) | Selected percentiles (95% conf. interval) | | | Sample size |
|--------------------------|--|---|------------------|------------------|-------------|
| | | 10th | 50th | 90th | |
| Males and Females | | | | | |
| Total, 6 years and older | 52.0 (43.7-61.9) | 4.81 (3.32-7.03) | 48.7 (38.2-65.0) | 546 (460-645) | 1495 |
| 6–11 years | 105 (81.0-136) | 11.9 (8.98-17.4) | 91.1 (65.5-149) | 957 (715-1660) | 225 |
| 12–19 years | 56.5 (47.8-66.8) | 7.20 (5.28-9.29) | 58.1 (45.6-71.6) | 511 (358-684) | 543 |
| 20–39 years | 43.0 (31.3-59.0) | 3.88 (<LOD-6.82) | 35.3 (23.2-57.9) | 486 (307-608) | 299 |
| 40–59 years | 46.9 (35.3-62.4) | 3.22 (<LOD-6.50) | 47.5 (36.0-67.3) | 483 (303-708) | 221 |
| 60 years and older | 40.3 (28.2-57.8) | 3.97 (<LOD-8.56) | 41.0 (27.1-73.4) | 343 (223-638) | 207 |
| Males | | | | | |
| Total, 6 years and older | 51.8 (39.5-68.0) | 4.77 (2.90-7.95) | 51.0 (38.2-72.0) | 585 (471-708) | 723 |
| 6–11 years | 110 (79.0-152) | 14.8 (10.2-24.5) | 91.1 (57.4-149) | 957 (596-1140) | 117 |
| 12–19 years | 56.4 (43.0-73.9) | 5.65 (3.59-9.03) | 64.9 (39.8-90.0) | 614 (358-837) | 276 |
| 20–39 years | 45.8 (28.9-72.6) | 3.90 (<LOD-7.95) | 40.6 (21.8-91.4) | 495 (307-641) | 126 |
| 40–59 years | 44.2 (27.9-69.9) | 3.31† (<LOD-9.43) | 45.9 (32.2-68.7) | 542† (198-1020) | 105 |
| 60 years and older | 27.4 (15.6-48.1) | < LOD† | 35.5 (15.0-63.9) | 201† (141-458) | 99 |
| Females | | | | | |
| Total, 6 years and older | 52.2 (44.0-62.0) | 4.81 (3.00-8.02) | 43.5 (34.1-65.5) | 495 (384-600) | 772 |
| 6–11 years | 100 (70.6-142) | 8.61† (<LOD-15.7) | 103 (55.2-201) | 1080† (649-2300) | 108 |
| 12–19 years | 56.6 (47.1-68.0) | 8.23 (5.38-9.99) | 51.2 (36.9-65.0) | 399 (266-684) | 267 |
| 20–39 years | 39.9 (27.9-57.0) | 3.50 (<LOD-10.4) | 30.6 (22.1-66.4) | 384 (271-517) | 173 |
| 40–59 years | 50.1 (36.0-69.6) | < LOD | 49.8 (27.9-102) | 474 (245-708) | 116 |
| 60 years and older | 55.6 (35.9-86.1) | 8.02† (<LOD-12.3) | 54.0 (28.9-89.9) | 479† (258-984) | 108 |

< LOD means less than the limit of detection for the uncorrected urine value, which may vary for some compounds by year. See Appendix D for LOD.

† Estimate is subject to greater uncertainty due to small cell size.

Table 5.2.g. Urinary daidzein: Non-Hispanic blacks (creatinine corrected)

Geometric mean and selected percentiles of urine concentrations (in µg/g creatinine) for non-Hispanic blacks in the U.S. population aged 6 years and older, National Health and Nutrition Examination Survey, 1999–2002.

| | Geometric mean (95% conf. interval) | Selected percentiles (95% conf. interval) | | | Sample size |
|--------------------------|--|---|------------------|-----------------|-------------|
| | | 10th | 50th | 90th | |
| Males and Females | | | | | |
| Total, 6 years and older | 51.3 (42.1-62.4) | 5.54 (3.95-7.05) | 57.1 (46.5-70.5) | 447 (306-599) | 1288 |
| 6–11 years | 113 (91.3-139) | 15.4 (10.2-21.8) | 109 (83.6-145) | 955 (683-1280) | 249 |
| 12–19 years | 67.0 (56.1-80.1) | 9.23 (6.59-10.9) | 75.7 (54.8-93.7) | 561 (317-975) | 450 |
| 20–39 years | 44.2 (32.2-60.8) | 5.07 (2.92-7.58) | 52.1 (38.4-71.7) | 348 (207-541) | 197 |
| 40–59 years | 39.6 (28.3-55.4) | 3.95 (<LOD-7.27) | 46.5 (26.5-64.1) | 272 (215-446) | 210 |
| 60 years and older | 42.5 (29.7-60.7) | 2.34 (<LOD-8.65) | 40.4 (27.2-79.3) | 488 (249-721) | 182 |
| Males | | | | | |
| Total, 6 years and older | 47.3 (34.8-64.3) | 5.07 (<LOD-8.50) | 54.1 (40.2-70.2) | 472 (297-600) | 627 |
| 6–11 years | 132 (96.4-180) | 17.7 (9.66-30.8) | 151 (80.0-229) | 1050 (661-1300) | 127 |
| 12–19 years | 67.3 (55.8-81.2) | 9.03 (4.93-11.3) | 80.8 (61.6-106) | 499 (370-650) | 211 |
| 20–39 years | 36.1 (22.5-57.7) | 5.17† (<LOD-8.50) | 41.2 (24.5-70.2) | 249† (162-541) | 91 |
| 40–59 years | 31.9 (18.4-55.2) | 1.76† (<LOD-10.2) | 38.4 (20.4-64.8) | 258† (117-696) | 109 |
| 60 years and older | 41.4 (22.1-77.7) | < LOD† | 36.0 (23.1-92.3) | 562† (214-1370) | 89 |
| Females | | | | | |
| Total, 6 years and older | 54.9 (46.3-65.0) | 6.20 (3.75-8.65) | 62.2 (48.7-77.1) | 430 (302-639) | 661 |
| 6–11 years | 95.0 (71.7-126) | 11.9 (<LOD-20.6) | 86.3 (69.7-129) | 773 (381-1640) | 122 |
| 12–19 years | 66.7 (51.9-85.8) | 9.35 (5.68-12.5) | 72.7 (42.1-91.2) | 622 (251-1160) | 239 |
| 20–39 years | 51.9 (37.2-72.6) | 4.86† (2.92-7.58) | 64.6 (47.0-92.1) | 372† (207-639) | 106 |
| 40–59 years | 47.6 (35.3-64.2) | 6.58† (<LOD-11.1) | 48.4 (29.1-70.8) | 302† (215-802) | 101 |
| 60 years and older | 43.2 (28.0-66.6) | 2.31† (<LOD-10.0) | 44.0 (24.3-85.9) | 463† (248-828) | 93 |

< LOD means less than the limit of detection for the uncorrected urine value, which may vary for some compounds by year. See Appendix D for LOD.
† Estimate is subject to greater uncertainty due to small cell size.

Table 5.2.h. Urinary daidzein: Non-Hispanic whites (creatinine corrected)

Geometric mean and selected percentiles of urine concentrations (in µg/g creatinine) for non-Hispanic whites in the U.S. population aged 6 years and older, National Health and Nutrition Examination Survey, 1999–2002.

| | Geometric mean (95% conf. interval) | Selected percentiles (95% conf. interval) | | | Sample size |
|--------------------------|--|---|------------------|----------------|-------------|
| | | 10th | 50th | 90th | |
| Males and Females | | | | | |
| Total, 6 years and older | 58.1 (52.9-64.0) | 6.90 (5.66-9.03) | 57.8 (51.0-64.2) | 506 (413-601) | 2112 |
| 6–11 years | 90.9 (75.0-110) | 19.0 (14.3-25.4) | 88.3 (70.8-112) | 494 (324-710) | 196 |
| 12–19 years | 63.8 (46.5-87.6) | 7.18 (4.27-12.2) | 63.6 (44.8-96.2) | 601 (386-987) | 375 |
| 20–39 years | 54.0 (47.0-62.1) | 6.52 (4.85-8.83) | 49.8 (39.7-60.4) | 579 (384-847) | 529 |
| 40–59 years | 57.4 (47.5-69.3) | 6.54 (4.23-9.94) | 59.0 (44.1-70.2) | 548 (377-807) | 434 |
| 60 years and older | 51.8 (44.0-61.0) | 6.01 (3.86-8.87) | 53.4 (41.3-69.6) | 318 (260-475) | 578 |
| Males | | | | | |
| Total, 6 years and older | 53.7 (47.4-60.7) | 6.62 (5.39-8.80) | 54.1 (45.5-63.3) | 464 (336-586) | 1038 |
| 6–11 years | 95.0 (70.0-129) | 24.9† (14.1-31.9) | 88.3 (56.2-152) | 425† (302-710) | 101 |
| 12–19 years | 60.2 (39.6-91.4) | 9.03 (4.43-12.7) | 58.5 (41.9-92.6) | 463 (217-1030) | 190 |
| 20–39 years | 45.4 (36.2-56.9) | 5.50 (2.82-8.07) | 40.4 (29.1-54.6) | 497 (248-850) | 231 |
| 40–59 years | 52.5 (43.0-64.0) | 6.03 (4.60-9.94) | 47.0 (34.5-71.5) | 502 (276-723) | 225 |
| 60 years and older | 50.7 (40.7-63.3) | 5.14 (3.40-8.87) | 61.7 (45.4-80.0) | 313 (215-555) | 291 |
| Females | | | | | |
| Total, 6 years and older | 62.8 (55.9-70.5) | 7.48 (5.49-10.5) | 60.8 (52.8-70.4) | 564 (423-655) | 1074 |
| 6–11 years | 86.6 (62.6-120) | 16.5† (11.1-21.2) | 86.6 (55.2-113) | 655† (275-938) | 95 |
| 12–19 years | 68.2 (48.9-95.0) | 6.56 (4.27-9.12) | 73.4 (45.1-113) | 628 (442-990) | 185 |
| 20–39 years | 64.0 (51.1-80.2) | 8.28 (2.74-14.0) | 58.0 (44.1-88.7) | 607 (384-852) | 298 |
| 40–59 years | 62.7 (46.3-84.9) | 6.79 (<LOD-12.6) | 65.4 (41.0-79.9) | 564 (356-1220) | 209 |
| 60 years and older | 52.6 (42.5-65.1) | 6.27 (<LOD-11.3) | 49.2 (35.1-66.1) | 316 (250-555) | 287 |

< LOD means less than the limit of detection for the uncorrected urine value, which may vary for some compounds by year. See Appendix D for LOD.
† Estimate is subject to greater uncertainty due to small cell size.

Table 5.3.a. Urinary equol: Total population

Geometric mean and selected percentiles of urine concentrations (in µg/L) for the total U.S. population aged 6 years and older, National Health and Nutrition Examination Survey, 1999–2002.

| | Geometric mean (95% conf. interval) | Selected percentiles (95% conf. interval) | | | Sample size |
|--------------------------|--|---|------------------|------------------|-------------|
| | | 10th | 50th | 90th | |
| Males and Females | | | | | |
| Total, 6 years and older | 8.77 (7.84-9.81) | < LOD | 8.28 (7.21-9.50) | 38.5 (33.1-45.2) | 4976 |
| 6–11 years | 11.5 (9.82-13.5) | < LOD | 13.4 (10.1-16.1) | 45.9 (32.3-59.6) | 668 |
| 12–19 years | 10.4 (9.08-11.9) | < LOD | 10.5 (8.70-12.1) | 43.1 (35.6-53.1) | 1401 |
| 20–39 years | 8.54 (7.40-9.86) | < LOD | 8.16 (6.78-9.80) | 37.6 (29.5-47.4) | 1043 |
| 40–59 years | 8.39 (7.24-9.73) | < LOD | 7.80 (6.20-9.20) | 37.1 (28.7-48.7) | 909 |
| 60 years and older | 7.52 (6.59-8.58) | < LOD | 6.68 (5.13-8.20) | 34.5 (27.9-41.7) | 955 |
| Males | | | | | |
| Total, 6 years and older | 9.26 (8.17-10.5) | < LOD | 8.70 (7.63-10.3) | 39.6 (32.7-48.7) | 2417 |
| 6–11 years | 12.7 (10.1-16.0) | < LOD | 13.7 (8.95-17.2) | 56.0 (38.3-78.9) | 347 |
| 12–19 years | 10.5 (8.82-12.5) | < LOD | 10.4 (8.49-12.9) | 43.1 (35.2-56.1) | 690 |
| 20–39 years | 8.68 (7.39-10.2) | < LOD | 7.90 (6.40-9.40) | 38.2 (29.5-48.9) | 454 |
| 40–59 years | 8.90 (7.47-10.6) | < LOD | 9.20 (7.10-10.5) | 34.4 (27.4-45.2) | 454 |
| 60 years and older | 8.19 (6.75-9.94) | < LOD | 6.83 (5.30-9.68) | 35.6 (29.8-46.7) | 472 |
| Females | | | | | |
| Total, 6 years and older | 8.33 (7.39-9.39) | < LOD | 7.89 (6.80-9.17) | 37.6 (32.2-42.7) | 2559 |
| 6–11 years | 10.3 (8.60-12.3) | < LOD | 12.6 (9.40-15.5) | 33.5 (28.0-51.0) | 321 |
| 12–19 years | 10.3 (8.87-11.9) | < LOD | 10.5 (8.70-12.1) | 42.9 (32.1-58.7) | 711 |
| 20–39 years | 8.40 (6.97-10.1) | < LOD | 8.60 (6.50-10.9) | 37.5 (25.3-50.9) | 589 |
| 40–59 years | 7.94 (6.53-9.66) | < LOD | 6.27 (4.70-8.04) | 40.3 (28.5-56.6) | 455 |
| 60 years and older | 7.04 (6.28-7.89) | < LOD | 6.56 (4.60-8.13) | 30.5 (23.5-43.2) | 483 |

< LOD means less than the limit of detection, which may vary for some compounds by year. See Appendix D for LOD.

Table 5.3.b. Urinary equol: Mexican Americans

Geometric mean and selected percentiles of urine concentrations (in µg/L) for Mexican Americans in the U.S. population aged 6 years and older, National Health and Nutrition Examination Survey, 1999–2002.

| | Geometric mean (95% conf. interval) | Selected percentiles (95% conf. interval) | | | Sample size |
|--------------------------|--|---|------------------|-------------------|-------------|
| | | 10th | 50th | 90th | |
| Males and Females | | | | | |
| Total, 6 years and older | 6.16 (5.59-6.79) | < LOD | 5.20 (4.44-6.05) | 25.0 (19.9-31.0) | 1405 |
| 6–11 years | 7.70 (6.18-9.60) | < LOD | 6.51 (5.11-9.20) | 29.0 (20.7-48.7) | 216 |
| 12–19 years | 7.72 (6.95-8.58) | < LOD | 6.90 (5.70-8.10) | 33.0 (25.9-44.4) | 507 |
| 20–39 years | * | < LOD | 4.40 (<LOD-5.50) | 21.1 (13.7-32.2) | 276 |
| 40–59 years | 6.06 (5.00-7.34) | < LOD | 5.10 (4.00-6.44) | 21.3 (13.4-39.9) | 213 |
| 60 years and older | * | < LOD | 4.07 (<LOD-5.05) | 16.9 (12.9-22.8) | 193 |
| Males | | | | | |
| Total, 6 years and older | 6.25 (5.48-7.14) | < LOD | 5.18 (4.20-6.50) | 26.2 (19.1-32.9) | 676 |
| 6–11 years | 8.16 (6.20-10.8) | < LOD | 8.53 (4.83-12.8) | 29.5 (20.3-48.7) | 112 |
| 12–19 years | 7.31 (6.40-8.35) | < LOD | 6.50 (5.50-7.67) | 31.0 (19.7-48.6) | 256 |
| 20–39 years | * | < LOD | 4.20 (<LOD-5.49) | 20.5 (13.7-32.1) | 117 |
| 40–59 years | 6.91 (5.13-9.30) | < LOD† | 6.50 (3.86-9.48) | 22.1† (14.0-42.4) | 98 |
| 60 years and older | * | < LOD† | 4.14 (<LOD-5.51) | 14.8† (9.20-22.8) | 93 |
| Females | | | | | |
| Total, 6 years and older | 6.07 (5.49-6.71) | < LOD | 5.36 (4.30-6.00) | 22.3 (19.1-29.0) | 729 |
| 6–11 years | 7.25 (5.56-9.44) | < LOD† | 6.30 (4.96-8.20) | 28.6† (18.8-76.3) | 104 |
| 12–19 years | 8.20 (7.23-9.30) | < LOD | 7.56 (5.84-8.90) | 37.2 (21.3-56.4) | 251 |
| 20–39 years | 5.51 (4.44-6.85) | < LOD | 4.99 (3.30-6.60) | 16.9 (12.3-35.4) | 159 |
| 40–59 years | 5.32 (4.29-6.59) | < LOD | 4.50 (3.50-5.42) | 17.3 (10.1-32.7) | 115 |
| 60 years and older | * | < LOD† | 3.88 (<LOD-6.08) | 19.0† (8.30-160) | 100 |

< LOD means less than the limit of detection, which may vary for some compounds by year. See Appendix D for LOD.

† Estimate is subject to greater uncertainty due to small cell size.

* Not calculated. Proportion of results below limit of detection was too high to provide a valid result.

Table 5.3.c. Urinary equol: Non-Hispanic blacks

Geometric mean and selected percentiles of urine concentrations (in µg/L) for non-Hispanic blacks in the U.S. population aged 6 years and older, National Health and Nutrition Examination Survey, 1999–2002.

| | Geometric mean (95% conf. interval) | Selected percentiles (95% conf. interval) | | | Sample size |
|--------------------------|--|---|------------------|-------------------|-------------|
| | | 10th | 50th | 90th | |
| Males and Females | | | | | |
| Total, 6 years and older | 6.89 (6.04-7.86) | < LOD | 6.09 (4.86-7.50) | 28.8 (23.3-34.4) | 1196 |
| 6–11 years | 8.83 (7.19-10.8) | < LOD | 9.90 (5.70-13.6) | 31.0 (23.5-44.0) | 223 |
| 12–19 years | 9.45 (8.03-11.1) | < LOD | 9.90 (7.77-12.0) | 40.4 (29.9-51.0) | 424 |
| 20–39 years | 6.93 (5.62-8.55) | < LOD | 5.90 (4.40-7.80) | 29.6 (21.4-41.4) | 178 |
| 40–59 years | 6.12 (5.16-7.26) | < LOD | 5.00 (3.60-7.43) | 24.4 (19.4-30.2) | 199 |
| 60 years and older | * | < LOD | < LOD | 18.9 (11.6-27.6) | 172 |
| Males | | | | | |
| Total, 6 years and older | 7.68 (6.62-8.92) | < LOD | 6.90 (5.10-8.50) | 31.4 (26.1-39.8) | 588 |
| 6–11 years | 9.56 (7.44-12.3) | < LOD | 9.90 (5.49-13.6) | 34.4 (30.2-79.5) | 120 |
| 12–19 years | 9.68 (7.99-11.7) | < LOD | 10.6 (6.90-13.6) | 40.8 (28.4-51.6) | 201 |
| 20–39 years | 7.64 (5.88-9.92) | < LOD† | 5.47 (4.20-9.71) | 35.6† (21.5-89.9) | 80 |
| 40–59 years | 7.30 (6.02-8.84) | < LOD† | 7.40 (5.05-9.00) | 26.0† (19.8-35.3) | 104 |
| 60 years and older | * | < LOD† | < LOD | 18.9† (7.60-32.0) | 83 |
| Females | | | | | |
| Total, 6 years and older | 6.28 (5.36-7.36) | < LOD | 5.44 (3.70-7.13) | 26.2 (18.9-35.4) | 608 |
| 6–11 years | 8.00 (6.05-10.6) | < LOD† | 9.48 (4.10-14.7) | 26.2† (19.8-31.8) | 103 |
| 12–19 years | 9.22 (7.50-11.3) | < LOD | 9.60 (7.20-11.6) | 40.8 (29.9-73.4) | 223 |
| 20–39 years | 6.44 (4.84-8.57) | < LOD† | 6.17 (3.50-8.30) | 22.9† (14.3-43.4) | 98 |
| 40–59 years | * | < LOD† | 3.80 (<LOD-6.99) | 21.2† (13.4-34.1) | 95 |
| 60 years and older | * | < LOD† | < LOD | 20.7† (10.5-43.8) | 89 |

< LOD means less than the limit of detection, which may vary for some compounds by year. See Appendix D for LOD.
† Estimate is subject to greater uncertainty due to small cell size.
* Not calculated. Proportion of results below limit of detection was too high to provide a valid result.

Table 5.3.d. Urinary equol: Non-Hispanic whites

Geometric mean and selected percentiles of urine concentrations (in µg/L) for non-Hispanic whites in the U.S. population aged 6 years and older, National Health and Nutrition Examination Survey, 1999–2002.

| | Geometric mean (95% conf. interval) | Selected percentiles (95% conf. interval) | | | Sample size |
|--------------------------|--|---|------------------|-------------------|-------------|
| | | 10th | 50th | 90th | |
| Males and Females | | | | | |
| Total, 6 years and older | 9.62 (8.32-11.1) | < LOD | 9.49 (7.73-11.2) | 41.3 (35.0-48.9) | 1955 |
| 6–11 years | 13.7 (10.7-17.6) | < LOD | 15.2 (11.1-19.4) | 53.3 (38.5-68.1) | 179 |
| 12–19 years | 11.3 (9.28-13.7) | < LOD | 11.7 (9.74-13.6) | 45.5 (36.9-58.8) | 350 |
| 20–39 years | 9.66 (7.87-11.9) | < LOD | 9.80 (7.63-12.4) | 39.0 (29.2-55.1) | 486 |
| 40–59 years | 9.34 (7.68-11.4) | < LOD | 9.00 (6.50-10.8) | 41.7 (31.7-60.7) | 415 |
| 60 years and older | 7.92 (6.81-9.21) | < LOD | 7.30 (5.58-9.40) | 34.5 (27.9-41.7) | 525 |
| Males | | | | | |
| Total, 6 years and older | 10.1 (8.58-11.8) | < LOD | 9.86 (8.00-12.2) | 44.0 (35.1-53.8) | 965 |
| 6–11 years | 14.6 (10.1-21.2) | < LOD† | 15.2 (8.00-26.3) | 59.0† (45.9-85.4) | 95 |
| 12–19 years | 11.1 (8.64-14.4) | < LOD | 10.9 (7.90-15.2) | 48.1 (36.9-81.5) | 179 |
| 20–39 years | 9.81 (7.97-12.1) | < LOD | 9.18 (7.60-12.3) | 38.6 (29.5-57.5) | 214 |
| 40–59 years | 9.51 (7.58-11.9) | < LOD | 9.82 (6.70-12.5) | 39.7 (27.4-53.8) | 213 |
| 60 years and older | 8.91 (7.00-11.3) | < LOD | 7.51 (5.52-12.4) | 36.8 (30.1-46.7) | 264 |
| Females | | | | | |
| Total, 6 years and older | 9.22 (7.83-10.8) | < LOD | 9.00 (7.40-11.1) | 39.7 (34.1-45.8) | 990 |
| 6–11 years | 12.7 (9.69-16.7) | < LOD† | 15.1 (11.7-19.4) | 36.3† (28.6-53.3) | 84 |
| 12–19 years | 11.4 (9.19-14.1) | < LOD | 12.1 (9.90-14.1) | 39.4 (25.1-61.5) | 171 |
| 20–39 years | 9.51 (7.30-12.4) | < LOD | 10.0 (7.11-13.3) | 39.0 (26.2-55.1) | 272 |
| 40–59 years | 9.18 (6.95-12.1) | < LOD | 7.80 (5.04-9.80) | 42.1 (33.3-93.9) | 202 |
| 60 years and older | 7.21 (6.46-8.06) | < LOD | 7.26 (4.97-8.67) | 28.5 (22.1-38.4) | 261 |

< LOD means less than the limit of detection, which may vary for some compounds by year. See Appendix D for LOD.
† Estimate is subject to greater uncertainty due to small cell size.

Table 5.3.e. Urinary equol: Total population (creatinine corrected)

Geometric mean and selected percentiles of urine concentrations (in µg/g creatinine) for the total U.S. population aged 6 years and older, National Health and Nutrition Examination Survey, 1999–2002.

| | Geometric mean (95% conf. interval) | Selected percentiles (95% conf. interval) | | | Sample size |
|--------------------------|--|---|------------------|------------------|-------------|
| | | 10th | 50th | 90th | |
| Males and Females | | | | | |
| Total, 6 years and older | 8.22 (7.38-9.17) | < LOD | 7.98 (7.07-9.04) | 35.1 (30.3-39.5) | 4976 |
| 6–11 years | 12.4 (10.5-14.7) | < LOD | 12.5 (10.3-16.0) | 45.6 (33.6-62.8) | 668 |
| 12–19 years | 7.68 (6.80-8.67) | < LOD | 7.82 (6.91-8.70) | 30.3 (24.3-39.1) | 1401 |
| 20–39 years | 6.90 (6.03-7.89) | < LOD | 6.68 (5.68-7.53) | 30.3 (25.0-36.3) | 1043 |
| 40–59 years | 8.40 (7.25-9.73) | < LOD | 7.88 (6.66-9.16) | 37.3 (29.6-46.3) | 909 |
| 60 years and older | 9.02 (7.98-10.2) | < LOD | 8.94 (7.32-10.2) | 37.8 (27.8-42.4) | 955 |
| Males | | | | | |
| Total, 6 years and older | 7.39 (6.53-8.36) | < LOD | 7.38 (6.30-8.42) | 31.1 (27.0-37.8) | 2417 |
| 6–11 years | 13.3 (10.4-16.9) | < LOD | 12.7 (8.51-17.5) | 48.1 (33.8-93.3) | 347 |
| 12–19 years | 7.55 (6.50-8.77) | < LOD | 7.63 (6.45-8.89) | 32.2 (25.9-45.3) | 690 |
| 20–39 years | 5.95 (5.04-7.03) | < LOD | 5.59 (4.93-6.42) | 25.0 (19.7-32.9) | 454 |
| 40–59 years | 7.30 (6.20-8.59) | < LOD | 7.53 (6.06-8.81) | 27.7 (22.4-39.5) | 454 |
| 60 years and older | 7.69 (6.43-9.20) | < LOD | 7.36 (5.50-9.92) | 27.9 (22.3-42.4) | 472 |
| Females | | | | | |
| Total, 6 years and older | 9.10 (8.09-10.2) | < LOD | 8.71 (7.60-9.84) | 37.8 (32.9-42.5) | 2559 |
| 6–11 years | 11.5 (9.40-14.0) | < LOD | 12.3 (10.3-16.3) | 37.5 (29.0-50.0) | 321 |
| 12–19 years | 7.82 (6.72-9.10) | < LOD | 8.02 (6.97-9.00) | 27.0 (23.3-31.7) | 711 |
| 20–39 years | 7.97 (6.78-9.36) | < LOD | 7.61 (6.23-9.54) | 32.9 (25.6-41.3) | 589 |
| 40–59 years | 9.57 (7.81-11.7) | < LOD | 8.63 (6.66-10.0) | 46.3 (36.4-67.7) | 455 |
| 60 years and older | 10.2 (9.23-11.3) | < LOD | 9.64 (8.27-10.6) | 38.8 (27.8-44.8) | 483 |

< LOD means less than the limit of detection for the uncorrected urine value, which may vary for some compounds by year. See Appendix D for LOD.

Table 5.3.f. Urinary equol: Mexican Americans (creatinine corrected)

Geometric mean and selected percentiles of urine concentrations (in µg/g creatinine) for Mexican Americans in the U.S. population aged 6 years and older, National Health and Nutrition Examination Survey, 1999–2002.

| | Geometric mean (95% conf. interval) | Selected percentiles (95% conf. interval) | | | Sample size |
|--------------------------|--|---|------------------|-------------------|-------------|
| | | 10th | 50th | 90th | |
| Males and Females | | | | | |
| Total, 6 years and older | 5.77 (5.28-6.31) | < LOD | 5.68 (4.95-6.39) | 26.3 (22.3-28.8) | 1405 |
| 6–11 years | 9.84 (8.15-11.9) | < LOD | 9.32 (7.52-11.9) | 37.1 (27.6-47.8) | 216 |
| 12–19 years | 6.19 (5.75-6.65) | < LOD | 6.02 (5.42-6.85) | 23.4 (19.2-30.2) | 507 |
| 20–39 years | * | < LOD | 4.46 (<LOD-5.96) | 18.9 (15.2-23.6) | 276 |
| 40–59 years | 6.12 (5.11-7.34) | < LOD | 5.68 (4.55-7.16) | 27.6 (18.7-32.6) | 213 |
| 60 years and older | * | < LOD | 5.16 (<LOD-7.14) | 21.8 (16.2-33.3) | 193 |
| Males | | | | | |
| Total, 6 years and older | 5.24 (4.74-5.79) | < LOD | 5.05 (4.19-6.31) | 21.2 (17.9-24.6) | 676 |
| 6–11 years | 9.88 (7.79-12.5) | < LOD | 10.0 (7.61-13.4) | 31.4 (22.3-46.6) | 112 |
| 12–19 years | 5.60 (4.95-6.34) | < LOD | 5.92 (4.60-6.66) | 22.8 (16.2-28.6) | 256 |
| 20–39 years | * | < LOD | 3.66 (<LOD-5.72) | 15.2 (10.7-19.9) | 117 |
| 40–59 years | 5.84 (4.35-7.84) | < LOD† | 5.46 (3.86-7.32) | 27.6† (14.9-36.3) | 98 |
| 60 years and older | * | < LOD† | 3.76 (<LOD-5.42) | 14.7† (7.75-34.2) | 93 |
| Females | | | | | |
| Total, 6 years and older | 6.40 (5.66-7.24) | < LOD | 5.99 (5.19-6.97) | 29.2 (25.3-35.3) | 729 |
| 6–11 years | 9.80 (7.76-12.4) | < LOD† | 9.00 (6.55-11.4) | 43.1† (27.9-106) | 104 |
| 12–19 years | 6.89 (6.07-7.82) | < LOD | 6.06 (5.10-7.73) | 25.2 (19.1-39.0) | 251 |
| 20–39 years | 5.13 (4.19-6.30) | < LOD | 5.17 (3.54-6.64) | 24.0 (15.7-39.6) | 159 |
| 40–59 years | 6.42 (4.80-8.60) | < LOD | 5.68 (4.55-8.65) | 27.9 (18.7-41.1) | 115 |
| 60 years and older | * | < LOD† | 6.77 (<LOD-8.26) | 25.9† (16.9-51.7) | 100 |

< LOD means less than the limit of detection for the uncorrected urine value, which may vary for some compounds by year. See Appendix D for LOD.

† Estimate is subject to greater uncertainty due to small cell size.

* Not calculated. Proportion of results below limit of detection was too high to provide a valid result.

Table 5.3.g. Urinary equol: Non-Hispanic blacks (creatinine corrected)

Geometric mean and selected percentiles of urine concentrations (in µg/g creatinine) for non-Hispanic blacks in the U.S. population aged 6 years and older, National Health and Nutrition Examination Survey, 1999–2002.

| | Geometric mean (95% conf. interval) | Selected percentiles (95% conf. interval) | | | Sample size |
|--------------------------|--|---|------------------|-------------------|-------------|
| | | 10th | 50th | 90th | |
| Males and Females | | | | | |
| Total, 6 years and older | 4.68 (4.10-5.34) | < LOD | 4.48 (3.70-5.41) | 19.1 (16.5-23.3) | 1196 |
| 6–11 years | 8.21 (6.66-10.1) | < LOD | 8.40 (6.92-10.6) | 33.6 (20.5-45.4) | 223 |
| 12–19 years | 5.35 (4.55-6.28) | < LOD | 5.46 (4.72-6.49) | 21.0 (17.2-28.1) | 424 |
| 20–39 years | 4.02 (3.23-4.99) | < LOD | 3.56 (2.85-4.96) | 15.8 (13.0-23.1) | 178 |
| 40–59 years | 4.09 (3.31-5.05) | < LOD | 3.64 (2.99-5.00) | 17.1 (11.9-22.7) | 199 |
| 60 years and older | * | < LOD | < LOD | 18.8 (12.3-25.7) | 172 |
| Males | | | | | |
| Total, 6 years and older | 4.66 (3.95-5.50) | < LOD | 4.48 (3.48-5.49) | 19.5 (16.9-25.2) | 588 |
| 6–11 years | 8.62 (6.68-11.1) | < LOD | 8.38 (6.11-12.2) | 38.3 (25.6-48.1) | 120 |
| 12–19 years | 5.27 (4.27-6.52) | < LOD | 5.49 (4.76-7.37) | 20.2 (14.0-33.9) | 201 |
| 20–39 years | 3.82 (2.78-5.23) | < LOD† | 3.47 (1.97-4.57) | 15.8† (10.5-35.3) | 80 |
| 40–59 years | 4.32 (3.51-5.30) | < LOD† | 4.07 (3.28-5.42) | 17.3† (11.6-27.0) | 104 |
| 60 years and older | * | < LOD† | < LOD | 12.3† (9.13-22.5) | 83 |
| Females | | | | | |
| Total, 6 years and older | 4.69 (4.05-5.45) | < LOD | 4.48 (3.56-5.75) | 18.6 (15.0-24.5) | 608 |
| 6–11 years | 7.74 (5.98-10.0) | < LOD† | 8.63 (6.25-10.9) | 26.2† (17.1-43.8) | 103 |
| 12–19 years | 5.42 (4.46-6.59) | < LOD | 5.44 (4.15-6.94) | 24.2 (17.0-32.1) | 223 |
| 20–39 years | 4.18 (3.16-5.53) | < LOD† | 3.76 (2.72-5.93) | 15.0† (12.3-23.1) | 98 |
| 40–59 years | * | < LOD† | 3.05 (<LOD-5.74) | 17.1† (9.11-38.0) | 95 |
| 60 years and older | * | < LOD† | < LOD | 21.2† (12.5-31.3) | 89 |

< LOD means less than the limit of detection for the uncorrected urine value, which may vary for some compounds by year. See Appendix D for LOD.
† Estimate is subject to greater uncertainty due to small cell size.
* Not calculated. Proportion of results below limit of detection was too high to provide a valid result.

Table 5.3.h. Urinary equol: Non-Hispanic whites (creatinine corrected)

Geometric mean and selected percentiles of urine concentrations (in µg/g creatinine) for non-Hispanic whites in the U.S. population aged 6 years and older, National Health and Nutrition Examination Survey, 1999–2002.

| | Geometric mean (95% conf. interval) | Selected percentiles (95% conf. interval) | | | Sample size |
|--------------------------|--|---|------------------|-------------------|-------------|
| | | 10th | 50th | 90th | |
| Males and Females | | | | | |
| Total, 6 years and older | 9.61 (8.36-11.0) | < LOD | 9.30 (7.93-10.6) | 38.7 (32.7-46.3) | 1955 |
| 6–11 years | 14.6 (11.3-18.8) | < LOD | 15.1 (11.4-21.4) | 51.5 (33.8-99.8) | 179 |
| 12–19 years | 8.77 (7.38-10.4) | < LOD | 8.89 (7.38-10.2) | 31.9 (25.8-47.4) | 350 |
| 20–39 years | 8.46 (7.10-10.1) | < LOD | 8.57 (6.85-10.3) | 32.9 (28.0-41.4) | 486 |
| 40–59 years | 9.78 (8.16-11.7) | < LOD | 8.78 (7.22-10.4) | 44.5 (32.3-55.9) | 415 |
| 60 years and older | 9.85 (8.61-11.3) | < LOD | 10.0 (8.48-11.6) | 38.0 (27.8-42.8) | 525 |
| Males | | | | | |
| Total, 6 years and older | 8.44 (7.22-9.86) | < LOD | 8.48 (7.07-9.94) | 35.8 (28.8-43.3) | 965 |
| 6–11 years | 15.9 (11.1-22.8) | < LOD† | 15.8 (8.10-27.0) | 64.3† (37.4-120) | 95 |
| 12–19 years | 8.63 (6.94-10.7) | < LOD | 8.51 (7.06-10.2) | 37.3 (26.8-64.3) | 179 |
| 20–39 years | 7.22 (5.89-8.86) | < LOD | 7.02 (5.59-9.20) | 28.8 (20.5-37.8) | 214 |
| 40–59 years | 7.97 (6.53-9.72) | < LOD | 7.97 (6.66-9.70) | 30.2 (22.7-42.3) | 213 |
| 60 years and older | 8.49 (6.91-10.4) | < LOD | 8.71 (5.85-12.3) | 28.9 (22.3-42.8) | 264 |
| Females | | | | | |
| Total, 6 years and older | 10.9 (9.38-12.7) | < LOD | 10.2 (8.63-12.3) | 41.8 (36.4-50.0) | 990 |
| 6–11 years | 13.2 (9.56-18.1) | < LOD† | 14.7 (11.6-20.7) | 43.3† (28.8-60.7) | 84 |
| 12–19 years | 8.94 (7.23-11.1) | < LOD | 9.00 (7.33-11.5) | 26.0 (21.5-41.7) | 171 |
| 20–39 years | 9.92 (8.12-12.1) | < LOD | 9.54 (7.50-12.7) | 36.4 (28.0-55.9) | 272 |
| 40–59 years | 11.9 (9.14-15.5) | < LOD | 9.71 (7.33-12.5) | 65.3 (37.7-94.0) | 202 |
| 60 years and older | 11.1 (9.88-12.4) | < LOD | 10.3 (9.38-12.0) | 41.0 (27.8-53.2) | 261 |

< LOD means less than the limit of detection for the uncorrected urine value, which may vary for some compounds by year. See Appendix D for LOD.
† Estimate is subject to greater uncertainty due to small cell size.

Table 5.4.a. Urinary O-desmethylangolensin: Total population

Geometric mean and selected percentiles of urine concentrations (in µg/L) for the total U.S. population aged 6 years and older, National Health and Nutrition Examination Survey, 1999–2002.

| | Geometric mean (95% conf. interval) | Selected percentiles (95% conf. interval) | | | Sample size |
|--------------------------|--|---|------------------|------------------|-------------|
| | | 10th | 50th | 90th | |
| Males and Females | | | | | |
| Total, 6 years and older | 4.18 (3.65-4.78) | < LOD | 4.00 (3.40-4.74) | 98.7 (75.9-122) | 5065 |
| 6–11 years | 5.97 (4.69-7.59) | < LOD | 6.50 (4.63-9.68) | 105 (59.6-176) | 683 |
| 12–19 years | 5.87 (4.59-7.50) | < LOD | 6.47 (4.47-8.60) | 122 (99.0-152) | 1411 |
| 20–39 years | 3.59 (2.91-4.43) | < LOD | 3.03 (2.50-4.10) | 121 (70.1-189) | 1085 |
| 40–59 years | 4.67 (3.64-5.98) | < LOD | 4.30 (3.20-5.50) | 111 (66.1-160) | 896 |
| 60 years and older | 2.94 (2.39-3.62) | < LOD | 3.01 (1.90-4.12) | 63.9 (40.3-73.7) | 990 |
| Males | | | | | |
| Total, 6 years and older | 4.24 (3.58-5.01) | < LOD | 4.22 (3.50-5.29) | 102 (74.2-137) | 2462 |
| 6–11 years | 6.61 (4.59-9.51) | < LOD | 8.40 (3.96-11.3) | 121 (52.7-235) | 345 |
| 12–19 years | 6.19 (4.51-8.50) | < LOD | 7.00 (4.22-10.6) | 105 (74.1-148) | 690 |
| 20–39 years | 3.44 (2.53-4.66) | < LOD | 3.00 (2.00-4.47) | 135 (53.9-259) | 474 |
| 40–59 years | 4.49 (3.45-5.86) | < LOD | 4.50 (2.80-6.30) | 108 (57.3-160) | 455 |
| 60 years and older | 3.18 (2.56-3.95) | < LOD | 3.60 (2.43-5.57) | 58.4 (36.3-85.2) | 498 |
| Females | | | | | |
| Total, 6 years and older | 4.12 (3.55-4.79) | < LOD | 3.90 (3.00-4.56) | 93.3 (70.9-128) | 2603 |
| 6–11 years | 5.38 (4.06-7.12) | < LOD | 5.10 (3.43-8.80) | 88.5 (59.2-161) | 338 |
| 12–19 years | 5.56 (4.09-7.55) | < LOD | 5.69 (3.63-7.80) | 137 (85.6-195) | 721 |
| 20–39 years | 3.75 (2.85-4.95) | < LOD | 3.11 (2.40-4.90) | 94.8 (57.2-228) | 611 |
| 40–59 years | 4.84 (3.43-6.82) | < LOD | 4.10 (2.83-5.51) | 125 (64.9-233) | 441 |
| 60 years and older | 2.77 (2.05-3.73) | < LOD | 2.40 (1.50-4.00) | 68.0 (33.8-81.6) | 492 |

< LOD means less than the limit of detection, which may vary for some compounds by year. See Appendix D for LOD.

Table 5.4.b. Urinary O-desmethylangolensin: Mexican Americans

Geometric mean and selected percentiles of urine concentrations (in µg/L) for Mexican Americans in the U.S. population aged 6 years and older, National Health and Nutrition Examination Survey, 1999–2002.

| | Geometric mean (95% conf. interval) | Selected percentiles (95% conf. interval) | | | Sample size |
|--------------------------|--|---|------------------|-------------------|-------------|
| | | 10th | 50th | 90th | |
| Males and Females | | | | | |
| Total, 6 years and older | 2.43 (1.78-3.34) | < LOD | 1.80 (1.00-2.84) | 86.0 (59.7-105) | 1400 |
| 6–11 years | 3.17 (2.23-4.49) | < LOD | 2.84 (1.70-4.04) | 61.5 (36.8-129) | 212 |
| 12–19 years | 3.07 (2.35-4.01) | < LOD | 2.49 (1.83-3.50) | 98.0 (65.2-137) | 508 |
| 20–39 years | * | < LOD | 1.40 (<LOD-3.40) | 87.8 (44.2-129) | 282 |
| 40–59 years | * | < LOD | 1.30 (.700-3.60) | 95.2 (36.5-191) | 209 |
| 60 years and older | * | < LOD | .420 (<LOD-2.40) | 25.2 (16.0-37.9) | 189 |
| Males | | | | | |
| Total, 6 years and older | 2.70 (1.77-4.13) | < LOD | 2.10 (.800-4.70) | 90.9 (66.4-129) | 686 |
| 6–11 years | 3.72 (2.29-6.02) | < LOD† | 3.75 (1.60-8.50) | 60.2† (29.3-140) | 111 |
| 12–19 years | 3.32 (2.53-4.36) | < LOD | 3.20 (2.00-5.02) | 86.5 (61.0-144) | 262 |
| 20–39 years | * | < LOD | 1.31 (<LOD-6.54) | 97.6 (59.7-189) | 122 |
| 40–59 years | 2.49 (1.48-4.19) | < LOD† | 1.30 (.500-4.70) | 122† (28.3-237) | 100 |
| 60 years and older | * | < LOD† | .420 (<LOD-3.30) | 17.0† (8.73-34.6) | 91 |
| Females | | | | | |
| Total, 6 years and older | 2.16 (1.63-2.87) | < LOD | 1.62 (.880-2.50) | 70.9 (40.6-90.1) | 714 |
| 6–11 years | 2.67 (1.88-3.81) | < LOD† | 2.28 (1.44-3.30) | 55.0† (20.3-129) | 101 |
| 12–19 years | 2.80 (1.86-4.23) | < LOD | 2.40 (1.25-3.60) | 98.0 (48.2-152) | 246 |
| 20–39 years | * | < LOD | 1.39 (<LOD-2.83) | 57.4 (25.2-88.3) | 160 |
| 40–59 years | * | < LOD† | 1.00 (<LOD-5.20) | 86.0† (18.6-191) | 109 |
| 60 years and older | * | < LOD† | < LOD | 33.2† (18.4-150) | 98 |

< LOD means less than the limit of detection, which may vary for some compounds by year. See Appendix D for LOD.
† Estimate is subject to greater uncertainty due to small cell size.
* Not calculated. Proportion of results below limit of detection was too high to provide a valid result.

Table 5.4.c. Urinary O-desmethylangolensin: Non-Hispanic blacks

Geometric mean and selected percentiles of urine concentrations (in µg/L) for non-Hispanic blacks in the U.S. population aged 6 years and older, National Health and Nutrition Examination Survey, 1999–2002.

| | Geometric mean (95% conf. interval) | Selected percentiles (95% conf. interval) | | | Sample size |
|--------------------------|--|---|------------------|------------------|-------------|
| | | 10th | 50th | 90th | |
| Males and Females | | | | | |
| Total, 6 years and older | 5.54 (4.63-6.64) | < LOD | 6.40 (5.10-7.98) | 116 (95.5-155) | 1219 |
| 6–11 years | 10.6 (7.78-14.5) | < LOD | 13.4 (9.40-22.5) | 226 (157-303) | 235 |
| 12–19 years | 10.5 (7.71-14.3) | < LOD | 13.2 (8.40-17.8) | 165 (131-238) | 424 |
| 20–39 years | 4.69 (2.93-7.51) | < LOD | 5.55 (2.66-9.30) | 103 (52.4-161) | 187 |
| 40–59 years | 4.42 (2.98-6.55) | < LOD | 4.67 (2.40-8.71) | 87.6 (58.0-114) | 199 |
| 60 years and older | 3.33 (1.97-5.64) | < LOD | 3.04 (1.20-5.70) | 99.1 (33.4-357) | 174 |
| Males | | | | | |
| Total, 6 years and older | 6.36 (4.70-8.59) | < LOD | 7.20 (4.80-10.2) | 143 (105-177) | 590 |
| 6–11 years | 13.2 (8.14-21.3) | < LOD | 22.5 (10.1-39.1) | 250 (158-355) | 121 |
| 12–19 years | 12.2 (8.73-17.0) | < LOD | 14.5 (7.90-20.7) | 171 (136-394) | 194 |
| 20–39 years | 5.91 (3.47-10.1) | < LOD† | 5.93 (2.60-14.3) | 128† (52.4-308) | 85 |
| 40–59 years | 3.78 (2.07-6.90) | < LOD† | 3.50 (1.10-9.30) | 99.4† (31.4-120) | 103 |
| 60 years and older | 4.09 (2.10-7.93) | < LOD† | 5.30 (1.18-7.60) | 77.4† (33.7-255) | 87 |
| Females | | | | | |
| Total, 6 years and older | 4.94 (4.05-6.02) | < LOD | 5.69 (4.50-7.90) | 100 (73.8-128) | 629 |
| 6–11 years | 8.38 (5.30-13.2) | < LOD | 10.4 (5.53-13.6) | 147 (64.2-281) | 114 |
| 12–19 years | 9.07 (5.81-14.2) | < LOD | 11.8 (6.64-20.1) | 141 (95.1-201) | 230 |
| 20–39 years | 3.92 (2.22-6.93) | < LOD† | 4.98 (1.40-9.40) | 79.7† (26.6-191) | 102 |
| 40–59 years | 5.04 (2.88-8.81) | < LOD† | 5.30 (2.10-13.3) | 81.6† (40.2-313) | 96 |
| 60 years and older | 2.89 (1.62-5.16) | < LOD† | 2.70 (.700-5.31) | 99.1† (21.0-502) | 87 |

< LOD means less than the limit of detection, which may vary for some compounds by year. See Appendix D for LOD.
† Estimate is subject to greater uncertainty due to small cell size.

Table 5.4.d. Urinary O-desmethylangolensin: Non-Hispanic whites

Geometric mean and selected percentiles of urine concentrations (in µg/L) for non-Hispanic whites in the U.S. population aged 6 years and older, National Health and Nutrition Examination Survey, 1999–2002.

| | Geometric mean (95% conf. interval) | Selected percentiles (95% conf. interval) | | | Sample size |
|--------------------------|--|---|------------------|------------------|-------------|
| | | 10th | 50th | 90th | |
| Males and Females | | | | | |
| Total, 6 years and older | 4.25 (3.59-5.04) | < LOD | 3.98 (3.30-4.80) | 98.7 (72.8-135) | 2021 |
| 6–11 years | 5.98 (4.20-8.50) | < LOD | 6.97 (3.43-11.5) | 88.0 (45.0-191) | 181 |
| 12–19 years | 6.26 (4.47-8.77) | < LOD | 6.50 (4.00-10.0) | 122 (76.9-172) | 360 |
| 20–39 years | 3.47 (2.58-4.66) | < LOD | 2.80 (2.03-4.40) | 129 (61.0-228) | 511 |
| 40–59 years | 5.40 (4.03-7.23) | < LOD | 4.56 (3.31-6.40) | 137 (76.4-202) | 405 |
| 60 years and older | 2.88 (2.23-3.71) | < LOD | 2.83 (1.71-4.20) | 58.4 (30.2-78.0) | 564 |
| Males | | | | | |
| Total, 6 years and older | 4.22 (3.44-5.18) | < LOD | 4.12 (3.31-5.40) | 96.8 (65.7-137) | 995 |
| 6–11 years | 6.33 (3.52-11.4) | < LOD† | 7.20 (3.30-15.7) | 88.0† (43.4-311) | 90 |
| 12–19 years | 6.27 (4.21-9.32) | < LOD | 6.50 (3.60-13.5) | 103 (61.6-148) | 181 |
| 20–39 years | 2.95 (1.95-4.48) | < LOD | 2.51 (1.20-4.47) | 96.0 (25.2-260) | 223 |
| 40–59 years | 5.35 (4.05-7.06) | < LOD | 5.28 (3.31-8.00) | 111 (58.4-178) | 213 |
| 60 years and older | 3.27 (2.60-4.12) | < LOD | 3.60 (1.90-6.00) | 58.4 (29.9-98.9) | 288 |
| Females | | | | | |
| Total, 6 years and older | 4.29 (3.50-5.25) | < LOD | 3.98 (2.79-4.98) | 106 (70.6-154) | 1026 |
| 6–11 years | 5.63 (3.55-8.95) | < LOD† | 5.90 (2.70-14.3) | 72.2† (30.5-176) | 91 |
| 12–19 years | 6.26 (3.92-10.0) | < LOD | 6.40 (3.50-11.7) | 166 (58.3-367) | 179 |
| 20–39 years | 4.05 (2.76-5.94) | < LOD | 3.80 (2.05-5.71) | 135 (51.2-250) | 288 |
| 40–59 years | 5.46 (3.47-8.59) | < LOD | 4.30 (2.36-6.40) | 154 (64.9-322) | 192 |
| 60 years and older | 2.59 (1.81-3.72) | < LOD | 2.10 (1.21-4.05) | 59.9 (17.7-85.1) | 276 |

< LOD means less than the limit of detection, which may vary for some compounds by year. See Appendix D for LOD.
† Estimate is subject to greater uncertainty due to small cell size.

Table 5.4.e. Urinary O-desmethylangolensin: Total population (creatinine corrected)

Geometric mean and selected percentiles of urine concentrations (in µg/g creatinine) for the total U.S. population aged 6 years and older, National Health and Nutrition Examination Survey, 1999–2002.

| | Geometric mean (95% conf. interval) | Selected percentiles (95% conf. interval) | | | Sample size |
|--------------------------|--|---|------------------|------------------|-------------|
| | | 10th | 50th | 90th | |
| Males and Females | | | | | |
| Total, 6 years and older | 3.91 (3.38-4.52) | < LOD | 3.74 (3.09-4.50) | 87.6 (69.8-108) | 5065 |
| 6–11 years | 6.62 (5.15-8.52) | < LOD | 6.64 (4.63-10.6) | 93.7 (65.0-144) | 683 |
| 12–19 years | 4.28 (3.25-5.65) | < LOD | 4.45 (3.22-6.51) | 76.5 (61.6-102) | 1411 |
| 20–39 years | 2.89 (2.33-3.59) | < LOD | 2.63 (1.96-3.66) | 87.8 (50.8-126) | 1085 |
| 40–59 years | 4.67 (3.70-5.90) | < LOD | 3.87 (2.73-5.68) | 112 (71.8-155) | 896 |
| 60 years and older | 3.51 (2.81-4.37) | < LOD | 3.19 (2.12-4.95) | 64.7 (50.8-76.0) | 990 |
| Males | | | | | |
| Total, 6 years and older | 3.43 (2.85-4.12) | < LOD | 3.51 (2.56-4.45) | 75.2 (58.5-96.5) | 2462 |
| 6–11 years | 7.12 (4.73-10.7) | < LOD | 6.80 (3.59-17.0) | 97.8 (56.2-233) | 345 |
| 12–19 years | 4.45 (3.20-6.19) | < LOD | 4.71 (3.41-8.02) | 70.2 (48.8-115) | 690 |
| 20–39 years | 2.40 (1.73-3.33) | < LOD | 2.05 (1.38-3.06) | 88.9 (34.3-151) | 474 |
| 40–59 years | 3.76 (2.88-4.92) | < LOD | 3.66 (2.46-5.76) | 80.3 (53.1-118) | 455 |
| 60 years and older | 2.96 (2.35-3.73) | < LOD | 2.92 (1.84-4.68) | 51.7 (35.4-64.2) | 498 |
| Females | | | | | |
| Total, 6 years and older | 4.43 (3.76-5.21) | < LOD | 3.92 (3.15-5.00) | 98.3 (70.3-140) | 2603 |
| 6–11 years | 6.14 (4.67-8.09) | < LOD | 6.61 (4.42-10.5) | 88.0 (52.7-158) | 338 |
| 12–19 years | 4.12 (2.97-5.71) | < LOD | 3.87 (2.50-5.90) | 89.5 (61.4-111) | 721 |
| 20–39 years | 3.45 (2.58-4.61) | < LOD | 3.62 (2.28-4.64) | 86.0 (43.2-155) | 611 |
| 40–59 years | 5.76 (4.18-7.94) | < LOD | 3.90 (2.69-7.27) | 147 (85.2-280) | 441 |
| 60 years and older | 4.00 (2.93-5.47) | < LOD | 3.40 (1.92-6.17) | 69.8 (56.9-109) | 492 |

< LOD means less than the limit of detection for the uncorrected urine value, which may vary for some compounds by year. See Appendix D for LOD.

Table 5.4.f. Urinary O-desmethylangolensin: Mexican Americans (creatinine corrected)

Geometric mean and selected percentiles of urine concentrations (in µg/g creatinine) for Mexican Americans in the U.S. population aged 6 years and older, National Health and Nutrition Examination Survey, 1999–2002.

| | Geometric mean (95% conf. interval) | Selected percentiles (95% conf. interval) | | | Sample size |
|--------------------------|--|---|------------------|-------------------|-------------|
| | | 10th | 50th | 90th | |
| Males and Females | | | | | |
| Total, 6 years and older | 2.26 (1.70-3.00) | < LOD | 1.69 (1.12-2.67) | 58.8 (48.6-87.8) | 1400 |
| 6–11 years | 4.11 (3.09-5.47) | < LOD | 3.69 (2.16-7.00) | 79.8 (53.6-114) | 212 |
| 12–19 years | 2.43 (1.85-3.19) | < LOD | 2.13 (1.55-3.17) | 61.5 (47.4-86.3) | 508 |
| 20–39 years | * | < LOD | 1.17 (<LOD-2.67) | 56.4 (29.9-103) | 282 |
| 40–59 years | * | < LOD | 1.56 (.805-3.55) | 58.8 (27.8-145) | 209 |
| 60 years and older | * | < LOD | 1.03 (<LOD-2.70) | 30.4 (21.4-55.3) | 189 |
| Males | | | | | |
| Total, 6 years and older | 2.23 (1.52-3.27) | < LOD | 1.64 (.932-3.90) | 61.4 (48.6-93.0) | 686 |
| 6–11 years | 4.52 (2.88-7.09) | < LOD† | 4.87 (1.72-8.95) | 93.0† (50.2-145) | 111 |
| 12–19 years | 2.50 (1.87-3.35) | < LOD | 2.82 (1.54-4.31) | 56.1 (37.2-71.2) | 262 |
| 20–39 years | * | < LOD | 1.45 (<LOD-4.56) | 60.0 (25.8-113) | 122 |
| 40–59 years | 2.04 (1.26-3.32) | < LOD† | 1.42 (.661-4.23) | 57.2† (19.6-218) | 100 |
| 60 years and older | * | < LOD† | .698 (<LOD-3.02) | 23.6† (11.1-33.2) | 91 |
| Females | | | | | |
| Total, 6 years and older | 2.30 (1.77-2.99) | < LOD | 1.69 (1.17-2.08) | 57.7 (41.7-87.6) | 714 |
| 6–11 years | 3.73 (2.62-5.29) | < LOD† | 2.44 (1.68-7.00) | 78.3† (27.1-108) | 101 |
| 12–19 years | 2.35 (1.57-3.52) | < LOD | 1.78 (1.10-2.78) | 68.3 (45.6-115) | 246 |
| 20–39 years | * | < LOD | 1.03 (<LOD-2.15) | 41.7 (15.5-87.6) | 160 |
| 40–59 years | * | < LOD† | 1.77 (<LOD-3.90) | 76.8† (29.1-145) | 109 |
| 60 years and older | * | < LOD† | < LOD | 55.3† (20.9-97.0) | 98 |

< LOD means less than the limit of detection for the uncorrected urine value, which may vary for some compounds by year. See Appendix D for LOD.

† Estimate is subject to greater uncertainty due to small cell size.

* Not calculated. Proportion of results below limit of detection was too high to provide a valid result.

Table 5.4.g. Urinary O-desmethylangolensin: Non-Hispanic blacks (creatinine corrected)

Geometric mean and selected percentiles of urine concentrations (in µg/g creatinine) for non-Hispanic blacks in the U.S. population aged 6 years and older, National Health and Nutrition Examination Survey, 1999–2002.

| | Geometric mean (95% conf. interval) | Selected percentiles (95% conf. interval) | | | Sample size |
|--------------------------|--|---|------------------|-------------------|-------------|
| | | 10th | 50th | 90th | |
| Males and Females | | | | | |
| Total, 6 years and older | 3.73 (3.08-4.51) | < LOD | 4.12 (3.20-5.48) | 71.9 (54.7-100) | 1219 |
| 6–11 years | 9.94 (7.43-13.3) | < LOD | 10.6 (8.27-18.2) | 217 (118-305) | 235 |
| 12–19 years | 5.88 (4.34-7.98) | < LOD | 7.25 (4.64-10.2) | 95.0 (57.0-142) | 424 |
| 20–39 years | 2.68 (1.70-4.23) | < LOD | 3.66 (1.67-5.69) | 45.4 (26.8-100) | 187 |
| 40–59 years | 2.95 (2.07-4.19) | < LOD | 2.93 (1.61-5.48) | 60.4 (36.7-81.9) | 199 |
| 60 years and older | 3.11 (1.99-4.85) | < LOD | 2.91 (1.64-4.83) | 75.6 (47.2-167) | 174 |
| Males | | | | | |
| Total, 6 years and older | 3.84 (2.85-5.19) | < LOD | 4.45 (2.64-7.30) | 79.7 (55.2-118) | 590 |
| 6–11 years | 12.3 (7.52-20.0) | < LOD | 18.0 (9.43-32.4) | 233 (119-363) | 121 |
| 12–19 years | 6.63 (4.79-9.18) | < LOD | 7.65 (4.69-11.1) | 109 (59.1-198) | 194 |
| 20–39 years | 2.87 (1.70-4.84) | < LOD† | 2.95 (1.28-8.61) | 42.9† (23.4-100) | 85 |
| 40–59 years | 2.27 (1.24-4.17) | < LOD† | 2.18 (.996-5.61) | 67.8† (23.2-84.4) | 103 |
| 60 years and older | 3.05 (1.64-5.69) | < LOD† | 2.79 (1.12-5.83) | 79.7† (26.3-151) | 87 |
| Females | | | | | |
| Total, 6 years and older | 3.63 (2.96-4.46) | < LOD | 4.05 (3.26-5.22) | 64.4 (47.0-90.4) | 629 |
| 6–11 years | 7.89 (5.57-11.2) | < LOD | 8.27 (4.80-10.9) | 104 (62.9-305) | 114 |
| 12–19 years | 5.24 (3.35-8.21) | < LOD | 5.83 (3.15-11.1) | 71.9 (47.5-142) | 230 |
| 20–39 years | 2.54 (1.45-4.46) | < LOD† | 3.36 (1.42-5.69) | 42.1† (22.1-185) | 102 |
| 40–59 years | 3.67 (2.23-6.04) | < LOD† | 3.61 (1.61-7.58) | 54.4† (34.1-147) | 96 |
| 60 years and older | 3.14 (1.90-5.19) | < LOD† | 2.91 (1.31-6.30) | 75.6† (23.8-359) | 87 |

< LOD means less than the limit of detection for the uncorrected urine value, which may vary for some compounds by year. See Appendix D for LOD.
† Estimate is subject to greater uncertainty due to small cell size.

Table 5.4.h. Urinary O-desmethylangolensin: Non-Hispanic whites (creatinine corrected)

Geometric mean and selected percentiles of urine concentrations (in µg/g creatinine) for non-Hispanic whites in the U.S. population aged 6 years and older, National Health and Nutrition Examination Survey, 1999–2002.

| | Geometric mean (95% conf. interval) | Selected percentiles (95% conf. interval) | | | Sample size |
|--------------------------|--|---|------------------|------------------|-------------|
| | | 10th | 50th | 90th | |
| Males and Females | | | | | |
| Total, 6 years and older | 4.24 (3.55-5.07) | < LOD | 3.78 (3.05-4.95) | 97.4 (71.8-125) | 2021 |
| 6–11 years | 6.69 (4.67-9.58) | < LOD | 6.80 (3.78-13.6) | 85.2 (47.9-190) | 181 |
| 12–19 years | 4.79 (3.27-7.03) | < LOD | 4.70 (3.14-8.91) | 83.6 (60.3-125) | 360 |
| 20–39 years | 3.01 (2.28-3.98) | < LOD | 2.72 (1.89-3.77) | 97.4 (50.8-151) | 511 |
| 40–59 years | 5.67 (4.36-7.37) | < LOD | 5.32 (2.96-7.96) | 136 (71.8-210) | 405 |
| 60 years and older | 3.56 (2.74-4.64) | < LOD | 3.17 (1.83-5.45) | 64.5 (45.6-83.0) | 564 |
| Males | | | | | |
| Total, 6 years and older | 3.60 (2.89-4.49) | < LOD | 3.51 (2.54-4.68) | 76.4 (54.1-102) | 995 |
| 6–11 years | 7.20 (3.84-13.5) | < LOD† | 6.80 (2.85-21.3) | 90.2† (39.0-407) | 90 |
| 12–19 years | 4.85 (3.15-7.46) | < LOD | 4.71 (3.05-13.5) | 62.2 (45.9-125) | 181 |
| 20–39 years | 2.24 (1.48-3.39) | < LOD | 1.96 (1.27-3.06) | 88.2 (23.5-151) | 223 |
| 40–59 years | 4.56 (3.50-5.94) | < LOD | 4.91 (2.73-7.08) | 96.5 (43.2-161) | 213 |
| 60 years and older | 3.12 (2.43-4.01) | < LOD | 3.17 (1.83-5.10) | 49.3 (31.6-76.0) | 288 |
| Females | | | | | |
| Total, 6 years and older | 4.97 (4.04-6.10) | < LOD | 4.15 (3.15-6.03) | 120 (72.2-153) | 1026 |
| 6–11 years | 6.19 (4.04-9.49) | < LOD† | 6.86 (3.85-13.6) | 84.7† (37.9-179) | 91 |
| 12–19 years | 4.74 (2.93-7.67) | < LOD | 4.64 (2.43-8.27) | 98.9 (61.4-292) | 179 |
| 20–39 years | 4.01 (2.77-5.79) | < LOD | 4.01 (2.52-5.73) | 97.4 (45.6-165) | 288 |
| 40–59 years | 7.07 (4.69-10.7) | < LOD | 5.35 (2.45-10.1) | 159 (97.6-421) | 192 |
| 60 years and older | 3.96 (2.70-5.81) | < LOD | 2.86 (1.64-6.60) | 71.5 (49.1-114) | 276 |

< LOD means less than the limit of detection for the uncorrected urine value, which may vary for some compounds by year. See Appendix D for LOD.
† Estimate is subject to greater uncertainty due to small cell size.

Table 5.5.a. Urinary enterodiol: Total population

Geometric mean and selected percentiles of urine concentrations (in µg/L) for the total U.S. population aged 6 years and older, National Health and Nutrition Examination Survey, 1999–2002.

| | Geometric mean (95% conf. interval) | Selected percentiles (95% conf. interval) | | | Sample size |
|--------------------------|--|---|------------------|----------------|-------------|
| | | 10th | 50th | 90th | |
| Males and Females | | | | | |
| Total, 6 years and older | 31.1 (28.2-34.3) | 4.35 (3.35-5.50) | 36.7 (34.2-39.4) | 173 (155-189) | 5321 |
| 6–11 years | 30.2 (25.1-36.5) | 5.70 (3.50-7.90) | 33.4 (28.3-39.4) | 154 (113-219) | 723 |
| 12–19 years | 32.5 (28.8-36.8) | 5.50 (4.40-6.96) | 36.8 (31.8-40.7) | 165 (134-188) | 1488 |
| 20–39 years | 31.2 (27.1-35.8) | 4.15 (2.50-5.70) | 37.6 (34.4-44.2) | 170 (140-197) | 1139 |
| 40–59 years | 31.9 (27.1-37.5) | 3.80 (1.72-6.20) | 37.7 (33.9-42.6) | 191 (167-231) | 945 |
| 60 years and older | 29.1 (25.5-33.1) | 4.20 (2.80-5.50) | 33.1 (29.3-37.6) | 163 (142-190) | 1026 |
| Males | | | | | |
| Total, 6 years and older | 30.3 (26.8-34.2) | 3.79 (2.70-5.05) | 36.7 (33.2-40.4) | 168 (146-187) | 2581 |
| 6–11 years | 30.1 (24.1-37.6) | 5.70 (2.74-9.10) | 34.6 (27.0-44.1) | 132 (109-162) | 366 |
| 12–19 years | 28.6 (24.2-33.7) | 4.30 (2.70-6.94) | 32.7 (27.9-38.0) | 140 (111-186) | 729 |
| 20–39 years | 30.6 (25.9-36.0) | 3.60 (2.40-5.13) | 37.3 (32.0-46.5) | 152 (131-190) | 500 |
| 40–59 years | 32.7 (26.5-40.4) | 3.50 (<LOD-6.66) | 40.2 (33.8-48.4) | 207 (163-269) | 478 |
| 60 years and older | 27.0 (22.4-32.7) | 3.35 (2.00-4.47) | 33.1 (26.5-39.1) | 155 (118-197) | 508 |
| Females | | | | | |
| Total, 6 years and older | 31.8 (28.9-35.1) | 5.01 (3.50-6.40) | 37.0 (34.7-39.8) | 175 (160-197) | 2740 |
| 6–11 years | 30.3 (23.2-39.7) | 5.85 (2.40-8.53) | 33.4 (25.6-40.2) | 174 (98.1-279) | 357 |
| 12–19 years | 37.3 (31.6-44.0) | 6.70 (5.01-8.57) | 41.7 (34.7-49.8) | 171 (148-215) | 759 |
| 20–39 years | 31.8 (27.3-37.0) | 5.30 (1.80-7.40) | 38.5 (32.8-45.7) | 180 (139-220) | 639 |
| 40–59 years | 31.1 (25.5-37.9) | 3.88 (<LOD-8.50) | 36.0 (30.9-41.4) | 183 (148-231) | 467 |
| 60 years and older | 30.7 (26.1-36.2) | 5.00 (2.84-7.17) | 32.8 (29.3-37.7) | 163 (139-209) | 518 |

< LOD means less than the limit of detection, which may vary for some compounds by year. See Appendix D for LOD.

Table 5.5.b. Urinary enterodiol: Mexican Americans

Geometric mean and selected percentiles of urine concentrations (in µg/L) for Mexican Americans in the U.S. population aged 6 years and older, National Health and Nutrition Examination Survey, 1999–2002.

| | Geometric mean (95% conf. interval) | Selected percentiles (95% conf. interval) | | | Sample size |
|--------------------------|--|---|------------------|------------------|-------------|
| | | 10th | 50th | 90th | |
| Males and Females | | | | | |
| Total, 6 years and older | 25.8 (23.1-28.8) | 2.76 (1.68-4.00) | 30.9 (27.5-35.2) | 146 (128-169) | 1470 |
| 6–11 years | 19.4 (16.0-23.6) | < LOD | 22.3 (18.6-30.2) | 120 (92.6-156) | 222 |
| 12–19 years | 27.2 (22.6-32.8) | 3.80 (1.68-5.50) | 29.5 (25.4-37.8) | 159 (134-213) | 533 |
| 20–39 years | 28.6 (23.3-35.0) | 3.60 (1.60-6.50) | 34.3 (26.9-42.4) | 143 (110-202) | 300 |
| 40–59 years | 26.5 (21.5-32.6) | 2.38 (<LOD-6.60) | 32.4 (26.0-38.7) | 173 (141-256) | 216 |
| 60 years and older | 19.6 (15.3-25.2) | 2.13 (<LOD-5.40) | 23.8 (20.4-34.6) | 92.1 (74.0-143) | 199 |
| Males | | | | | |
| Total, 6 years and older | 23.5 (20.0-27.6) | 2.04 (<LOD-3.80) | 29.5 (23.7-35.0) | 137 (105-169) | 710 |
| 6–11 years | 18.4 (15.3-22.1) | < LOD | 21.3 (15.1-32.8) | 99.2 (79.2-158) | 115 |
| 12–19 years | 20.9 (16.8-26.0) | 1.68 (<LOD-4.53) | 24.9 (20.4-29.0) | 121 (99.9-159) | 269 |
| 20–39 years | 26.7 (19.8-36.0) | 1.84 (<LOD-6.30) | 30.9 (21.3-43.3) | 144 (92.5-216) | 127 |
| 40–59 years | 25.0 (18.6-33.6) | 2.36† (<LOD-7.70) | 33.0 (19.2-43.3) | 115† (75.9-244) | 104 |
| 60 years and older | 18.4 (12.8-26.4) | < LOD† | 22.0 (15.7-31.9) | 73.1† (43.8-134) | 95 |
| Females | | | | | |
| Total, 6 years and older | 28.5 (25.3-32.2) | 3.80 (2.21-5.74) | 33.4 (28.3-39.0) | 168 (141-192) | 760 |
| 6–11 years | 20.6 (14.6-29.0) | 2.01† (<LOD-5.30) | 24.2 (16.5-35.3) | 120† (92.6-219) | 107 |
| 12–19 years | 36.2 (29.2-45.0) | 5.20 (3.90-9.21) | 38.5 (29.3-51.0) | 197 (152-282) | 264 |
| 20–39 years | 31.0 (24.7-38.9) | 5.83 (<LOD-9.20) | 36.0 (26.9-48.1) | 132 (97.3-187) | 173 |
| 40–59 years | 28.2 (20.9-38.0) | 2.21 (<LOD-7.20) | 31.3 (20.0-47.2) | 197 (159-279) | 112 |
| 60 years and older | 20.7 (15.1-28.5) | 2.21† (<LOD-5.48) | 25.5 (16.8-37.9) | 101† (63.9-199) | 104 |

< LOD means less than the limit of detection, which may vary for some compounds by year. See Appendix D for LOD.

† Estimate is subject to greater uncertainty due to small cell size.

Table 5.5.c. Urinary enterodiol: Non-Hispanic blacks

Geometric mean and selected percentiles of urine concentrations (in µg/L) for non-Hispanic blacks in the U.S. population aged 6 years and older, National Health and Nutrition Examination Survey, 1999–2002.

| | Geometric mean (95% conf. interval) | Selected percentiles (95% conf. interval) | | | Sample size |
|--------------------------|--|---|------------------|------------------|-------------|
| | | 10th | 50th | 90th | |
| Males and Females | | | | | |
| Total, 6 years and older | 30.4 (26.5-34.9) | 4.87 (3.30-6.21) | 35.4 (31.4-38.4) | 168 (140-181) | 1289 |
| 6–11 years | 30.7 (26.3-35.9) | 6.64 (4.46-8.75) | 33.7 (27.5-38.7) | 132 (112-167) | 249 |
| 12–19 years | 34.9 (30.9-39.3) | 6.11 (3.56-8.33) | 41.6 (36.8-47.6) | 162 (132-213) | 451 |
| 20–39 years | 28.8 (22.0-37.7) | 5.80 (<LOD-8.67) | 35.3 (26.6-41.7) | 167 (115-210) | 197 |
| 40–59 years | 32.3 (25.6-40.9) | 4.54 (2.30-10.3) | 33.2 (25.7-44.9) | 207 (123-278) | 210 |
| 60 years and older | 25.7 (19.0-34.9) | 2.72 (<LOD-4.33) | 32.9 (24.4-40.4) | 147 (107-219) | 182 |
| Males | | | | | |
| Total, 6 years and older | 25.2 (21.6-29.3) | 4.00 (1.80-5.97) | 29.9 (25.0-34.3) | 124 (104-163) | 628 |
| 6–11 years | 29.5 (23.2-37.5) | 5.80 (3.30-8.75) | 35.5 (26.2-44.5) | 129 (80.3-167) | 127 |
| 12–19 years | 30.3 (25.8-35.4) | 5.70 (3.01-8.57) | 34.6 (25.9-42.1) | 140 (119-218) | 212 |
| 20–39 years | 22.8 (16.3-32.0) | < LOD† | 27.9 (16.6-35.3) | 107† (72.4-214) | 91 |
| 40–59 years | 25.2 (17.8-35.5) | 3.50† (<LOD-10.5) | 26.0 (20.0-34.9) | 123† (75.8-227) | 109 |
| 60 years and older | 20.3 (14.8-28.0) | < LOD† | 29.1 (19.3-38.0) | 96.3† (65.0-143) | 89 |
| Females | | | | | |
| Total, 6 years and older | 35.8 (29.9-42.9) | 5.50 (3.30-8.70) | 41.7 (35.4-47.0) | 180 (154-237) | 661 |
| 6–11 years | 32.1 (25.6-40.2) | 7.34 (4.00-11.4) | 33.7 (27.2-38.8) | 137 (92.6-230) | 122 |
| 12–19 years | 40.2 (33.4-48.4) | 6.13 (3.20-12.0) | 47.0 (38.7-59.2) | 171 (125-247) | 239 |
| 20–39 years | 34.7 (24.7-48.8) | 7.80† (<LOD-10.6) | 41.7 (32.5-50.4) | 176† (115-237) | 106 |
| 40–59 years | 40.0 (28.9-55.4) | 5.50† (2.30-13.1) | 37.8 (25.9-63.7) | 250† (144-340) | 101 |
| 60 years and older | 30.1 (18.5-48.8) | 2.80† (<LOD-6.25) | 36.3 (22.5-49.2) | 172† (123-396) | 93 |

< LOD means less than the limit of detection, which may vary for some compounds by year. See Appendix D for LOD.
† Estimate is subject to greater uncertainty due to small cell size.

Table 5.5.d. Urinary enterodiol: Non-Hispanic whites

Geometric mean and selected percentiles of urine concentrations (in µg/L) for non-Hispanic whites in the U.S. population aged 6 years and older, National Health and Nutrition Examination Survey, 1999–2002.

| | Geometric mean (95% conf. interval) | Selected percentiles (95% conf. interval) | | | Sample size |
|--------------------------|--|---|------------------|-----------------|-------------|
| | | 10th | 50th | 90th | |
| Males and Females | | | | | |
| Total, 6 years and older | 32.4 (29.3-35.8) | 4.68 (3.50-5.90) | 38.5 (36.0-41.7) | 173 (152-195) | 2110 |
| 6–11 years | 32.5 (24.6-42.8) | 5.90 (2.40-10.5) | 35.7 (28.1-44.8) | 152 (106-253) | 196 |
| 12–19 years | 32.7 (27.6-38.7) | 6.10 (3.97-7.80) | 35.4 (29.7-43.8) | 162 (127-185) | 375 |
| 20–39 years | 33.4 (28.3-39.5) | 4.70 (2.70-6.10) | 43.1 (37.4-47.1) | 174 (138-214) | 529 |
| 40–59 years | 33.2 (27.3-40.4) | 3.80 (<LOD-7.40) | 40.5 (35.8-46.7) | 207 (158-254) | 433 |
| 60 years and older | 29.6 (25.7-34.1) | 4.35 (2.74-6.10) | 33.4 (29.7-38.7) | 160 (139-190) | 577 |
| Males | | | | | |
| Total, 6 years and older | 32.7 (28.6-37.4) | 4.20 (2.92-5.56) | 40.0 (35.4-44.1) | 174 (146-198) | 1036 |
| 6–11 years | 33.7 (24.0-47.3) | 7.55† (<LOD-14.6) | 37.8 (25.7-50.9) | 135† (103-215) | 101 |
| 12–19 years | 28.6 (22.9-35.7) | 4.30 (2.38-7.80) | 32.5 (24.3-40.7) | 131 (99.1-174) | 190 |
| 20–39 years | 33.9 (27.3-42.2) | 3.79 (<LOD-5.95) | 44.2 (34.9-55.1) | 174 (132-226) | 231 |
| 40–59 years | 35.9 (28.1-46.0) | 3.65 (<LOD-7.40) | 46.7 (37.8-53.2) | 213 (167-263) | 224 |
| 60 years and older | 28.1 (22.8-34.7) | 3.35 (2.00-5.30) | 33.2 (26.5-40.0) | 163 (120-205) | 290 |
| Females | | | | | |
| Total, 6 years and older | 32.1 (29.0-35.6) | 5.35 (3.53-6.70) | 37.6 (35.0-41.1) | 171 (148-209) | 1074 |
| 6–11 years | 31.2 (20.5-47.7) | 5.85† (<LOD-12.2) | 34.1 (22.3-50.8) | 174† (87.0-327) | 95 |
| 12–19 years | 38.0 (29.5-48.9) | 6.87 (3.97-11.2) | 43.5 (29.3-58.0) | 170 (144-245) | 185 |
| 20–39 years | 33.0 (26.9-40.4) | 5.70 (1.80-7.60) | 41.1 (30.1-47.8) | 166 (130-220) | 298 |
| 40–59 years | 30.8 (24.1-39.4) | 4.09 (<LOD-10.4) | 36.2 (27.8-42.5) | 195 (127-259) | 209 |
| 60 years and older | 30.8 (25.6-37.2) | 5.18 (2.74-7.50) | 32.9 (29.2-39.8) | 160 (127-209) | 287 |

< LOD means less than the limit of detection, which may vary for some compounds by year. See Appendix D for LOD.
† Estimate is subject to greater uncertainty due to small cell size.

Table 5.5.e. Urinary enterodiol: Total population (creatinine corrected)

Geometric mean and selected percentiles of urine concentrations (in µg/g creatinine) for the total U.S. population aged 6 years and older, National Health and Nutrition Examination Survey, 1999–2002.

| | Geometric mean (95% conf. interval) | Selected percentiles (95% conf. interval) | | | Sample size |
|--------------------------|--|---|------------------|-----------------|-------------|
| | | 10th | 50th | 90th | |
| Males and Females | | | | | |
| Total, 6 years and older | 29.0 (26.5-31.7) | 4.17 (3.19-5.13) | 33.6 (31.1-36.8) | 150 (136-163) | 5321 |
| 6–11 years | 32.8 (27.6-39.0) | 5.61 (3.48-7.95) | 36.2 (30.8-42.7) | 188 (140-244) | 723 |
| 12–19 years | 23.5 (21.1-26.3) | 4.27 (2.64-5.42) | 26.6 (24.1-30.4) | 102 (93.2-117) | 1488 |
| 20–39 years | 25.0 (21.6-28.9) | 3.52 (2.52-5.12) | 28.2 (25.3-32.7) | 124 (108-156) | 1139 |
| 40–59 years | 32.0 (27.7-36.9) | 3.50 (2.54-5.86) | 39.1 (33.2-44.8) | 162 (140-197) | 945 |
| 60 years and older | 34.9 (31.1-39.2) | 5.13 (4.30-7.13) | 41.3 (35.6-46.2) | 174 (157-194) | 1026 |
| Males | | | | | |
| Total, 6 years and older | 24.3 (21.7-27.4) | 3.17 (2.52-4.34) | 28.8 (25.2-31.7) | 129 (111-152) | 2581 |
| 6–11 years | 31.8 (25.1-40.2) | 4.62 (2.80-8.38) | 34.8 (28.3-43.7) | 172 (112-244) | 366 |
| 12–19 years | 20.3 (17.2-23.9) | 3.27 (1.98-4.96) | 23.9 (20.5-28.1) | 94.1 (81.5-111) | 729 |
| 20–39 years | 21.3 (18.3-24.8) | 2.84 (2.15-4.03) | 24.6 (21.2-28.1) | 111 (96.4-130) | 500 |
| 40–59 years | 27.2 (22.4-33.0) | 3.19 (<LOD-5.80) | 31.7 (28.3-41.9) | 160 (121-201) | 478 |
| 60 years and older | 25.5 (20.5-31.7) | 2.96 (2.04-4.74) | 30.2 (23.8-35.4) | 138 (105-179) | 508 |
| Females | | | | | |
| Total, 6 years and older | 34.2 (31.2-37.5) | 5.26 (4.20-7.08) | 39.9 (36.6-43.8) | 162 (148-178) | 2740 |
| 6–11 years | 33.9 (26.8-42.8) | 6.64 (3.93-8.55) | 37.3 (28.6-50.1) | 193 (108-304) | 357 |
| 12–19 years | 27.5 (24.0-31.5) | 5.26 (3.66-7.26) | 30.0 (26.2-34.9) | 115 (100-132) | 759 |
| 20–39 years | 29.2 (24.7-34.6) | 4.73 (2.54-7.41) | 33.5 (28.1-40.6) | 141 (108-182) | 639 |
| 40–59 years | 37.3 (31.0-44.9) | 4.11 (<LOD-9.07) | 44.6 (39.0-53.0) | 165 (140-217) | 467 |
| 60 years and older | 44.4 (38.2-51.7) | 7.53 (5.23-12.3) | 51.4 (44.8-58.8) | 188 (164-222) | 518 |

< LOD means less than the limit of detection for the uncorrected urine value, which may vary for some compounds by year. See Appendix D for LOD.

Table 5.5.f. Urinary enterodiol: Mexican Americans (creatinine corrected)

Geometric mean and selected percentiles of urine concentrations (in µg/g creatinine) for Mexican Americans in the U.S. population aged 6 years and older, National Health and Nutrition Examination Survey, 1999–2002.

| | Geometric mean (95% conf. interval) | Selected percentiles (95% conf. interval) | | | Sample size |
|--------------------------|--|---|------------------|------------------|-------------|
| | | 10th | 50th | 90th | |
| Males and Females | | | | | |
| Total, 6 years and older | 23.8 (21.5-26.3) | 3.21 (2.34-4.32) | 27.6 (25.2-30.2) | 134 (116-158) | 1470 |
| 6–11 years | 24.8 (20.1-30.6) | < LOD | 32.4 (23.9-40.2) | 140 (105-182) | 222 |
| 12–19 years | 21.7 (18.2-25.7) | 3.35 (1.53-5.17) | 23.9 (19.0-30.4) | 115 (99.3-134) | 533 |
| 20–39 years | 23.6 (19.5-28.6) | 2.78 (1.62-5.36) | 27.1 (22.4-30.1) | 127 (91.4-181) | 300 |
| 40–59 years | 26.0 (21.3-31.6) | 4.20 (<LOD-6.80) | 30.6 (21.5-42.2) | 157 (126-192) | 216 |
| 60 years and older | 22.7 (17.8-28.9) | 2.26 (<LOD-7.79) | 31.3 (25.7-38.1) | 110 (80.0-149) | 199 |
| Males | | | | | |
| Total, 6 years and older | 19.4 (16.9-22.2) | 2.48 (<LOD-4.32) | 21.9 (18.9-26.1) | 117 (87.5-141) | 710 |
| 6–11 years | 21.9 (17.5-27.5) | < LOD | 26.9 (19.9-39.3) | 129 (83.7-188) | 115 |
| 12–19 years | 15.9 (12.6-20.2) | 1.99 (<LOD-3.66) | 18.3 (15.2-22.5) | 85.9 (73.8-115) | 269 |
| 20–39 years | 19.6 (14.9-25.9) | 2.34 (<LOD-5.83) | 20.0 (15.7-27.8) | 117 (82.1-179) | 127 |
| 40–59 years | 20.9 (15.9-27.5) | 4.92† (<LOD-6.91) | 23.5 (13.6-36.6) | 120† (59.6-192) | 104 |
| 60 years and older | 17.5 (12.0-25.7) | < LOD† | 22.7 (17.0-36.2) | 74.3† (49.3-179) | 95 |
| Females | | | | | |
| Total, 6 years and older | 29.8 (26.5-33.6) | 4.68 (2.71-7.01) | 34.4 (29.6-38.8) | 154 (127-193) | 760 |
| 6–11 years | 28.1 (20.5-38.7) | 2.82† (<LOD-6.25) | 37.3 (25.1-48.1) | 144† (98.7-279) | 107 |
| 12–19 years | 30.3 (25.3-36.3) | 6.40 (3.13-9.44) | 31.6 (24.0-43.4) | 156 (112-195) | 264 |
| 20–39 years | 29.3 (23.8-36.0) | 5.23 (<LOD-9.41) | 31.0 (27.1-38.8) | 133 (93.6-193) | 173 |
| 40–59 years | 32.7 (24.9-43.0) | 4.56 (<LOD-10.1) | 44.8 (27.0-59.4) | 183 (141-235) | 112 |
| 60 years and older | 28.2 (20.3-39.3) | 3.80† (<LOD-8.93) | 34.5 (28.6-42.2) | 130† (78.9-213) | 104 |

< LOD means less than the limit of detection for the uncorrected urine value, which may vary for some compounds by year. See Appendix D for LOD.
† Estimate is subject to greater uncertainty due to small cell size.

Table 5.5.g. Urinary enterodiol: Non-Hispanic blacks (creatinine corrected)

Geometric mean and selected percentiles of urine concentrations (in µg/g creatinine) for non-Hispanic blacks in the U.S. population aged 6 years and older, National Health and Nutrition Examination Survey, 1999–2002.

| | Geometric mean (95% conf. interval) | Selected percentiles (95% conf. interval) | | | Sample size |
|--------------------------|--|---|------------------|-------------------|-------------|
| | | 10th | 50th | 90th | |
| Males and Females | | | | | |
| Total, 6 years and older | 20.5 (17.5-24.0) | 3.30 (2.47-4.03) | 23.3 (19.7-26.6) | 118 (97.4-138) | 1289 |
| 6–11 years | 28.7 (24.0-34.4) | 5.03 (4.02-7.59) | 31.1 (26.1-38.8) | 126 (95.2-168) | 249 |
| 12–19 years | 19.6 (17.2-22.3) | 3.48 (2.11-4.47) | 23.5 (19.7-27.2) | 86.8 (72.7-116) | 451 |
| 20–39 years | 16.4 (12.2-22.0) | 2.15 (<LOD-4.41) | 19.3 (14.1-23.8) | 96.0 (68.6-128) | 197 |
| 40–59 years | 21.8 (16.9-28.2) | 3.57 (2.35-5.11) | 23.3 (16.2-31.4) | 145 (94.5-187) | 210 |
| 60 years and older | 24.2 (17.8-32.8) | 2.94 (<LOD-5.25) | 27.0 (22.7-38.6) | 146 (88.0-241) | 182 |
| Males | | | | | |
| Total, 6 years and older | 15.2 (12.9-18.0) | 2.40 (1.44-3.12) | 18.0 (14.6-21.0) | 84.6 (65.9-108) | 628 |
| 6–11 years | 27.3 (20.5-36.4) | 4.14 (2.52-9.49) | 30.8 (25.6-42.5) | 106 (77.7-168) | 127 |
| 12–19 years | 16.5 (14.0-19.5) | 2.23 (1.22-4.05) | 20.0 (15.1-24.3) | 82.9 (61.4-103) | 212 |
| 20–39 years | 11.1 (7.62-16.1) | < LOD† | 12.9 (10.3-18.0) | 70.4† (30.6-154) | 91 |
| 40–59 years | 15.3 (11.1-21.3) | 2.65† (<LOD-5.24) | 15.9 (12.8-21.0) | 72.6† (41.9-155) | 109 |
| 60 years and older | 15.1 (11.2-20.4) | < LOD† | 24.0 (13.9-30.2) | 66.1† (45.5-97.2) | 89 |
| Females | | | | | |
| Total, 6 years and older | 26.5 (21.6-32.5) | 4.41 (3.40-5.50) | 30.1 (23.5-37.7) | 138 (112-180) | 661 |
| 6–11 years | 30.3 (24.4-37.7) | 6.64 (4.20-8.88) | 33.8 (23.2-41.8) | 134 (93.9-209) | 122 |
| 12–19 years | 23.2 (19.3-28.0) | 3.96 (2.30-6.55) | 26.2 (22.6-30.0) | 106 (71.7-145) | 239 |
| 20–39 years | 22.4 (15.8-31.8) | 4.87† (<LOD-7.83) | 26.6 (18.2-41.9) | 99.4† (68.6-138) | 106 |
| 40–59 years | 29.4 (20.0-43.3) | 4.32† (2.35-8.07) | 34.8 (22.6-48.1) | 158† (118-321) | 101 |
| 60 years and older | 33.0 (20.2-53.7) | 3.35† (<LOD-9.66) | 33.3 (22.7-54.5) | 229† (123-590) | 93 |

< LOD means less than the limit of detection for the uncorrected urine value, which may vary for some compounds by year. See Appendix D for LOD.
† Estimate is subject to greater uncertainty due to small cell size.

Table 5.5.h. Urinary enterodiol: Non-Hispanic whites (creatinine corrected)

Geometric mean and selected percentiles of urine concentrations (in µg/g creatinine) for non-Hispanic whites in the U.S. population aged 6 years and older, National Health and Nutrition Examination Survey, 1999–2002.

| | Geometric mean (95% conf. interval) | Selected percentiles (95% conf. interval) | | | Sample size |
|--------------------------|--|---|------------------|-----------------|-------------|
| | | 10th | 50th | 90th | |
| Males and Females | | | | | |
| Total, 6 years and older | 32.3 (29.5-35.3) | 5.15 (3.94-6.23) | 37.4 (33.7-41.4) | 158 (140-174) | 2110 |
| 6–11 years | 35.3 (27.5-45.2) | 6.62 (3.23-9.63) | 40.3 (29.4-50.4) | 188 (132-281) | 196 |
| 12–19 years | 24.8 (21.2-29.0) | 5.02 (2.36-7.01) | 28.1 (24.3-33.6) | 99.5 (91.3-121) | 375 |
| 20–39 years | 29.1 (24.9-34.2) | 4.84 (2.92-6.99) | 31.3 (27.2-37.6) | 140 (109-182) | 529 |
| 40–59 years | 34.9 (29.3-41.5) | 3.68 (<LOD-7.14) | 43.4 (37.7-52.9) | 165 (135-208) | 433 |
| 60 years and older | 37.0 (32.4-42.2) | 5.89 (4.17-7.67) | 44.0 (36.7-50.3) | 179 (155-209) | 577 |
| Males | | | | | |
| Total, 6 years and older | 27.7 (24.5-31.3) | 3.53 (2.80-5.38) | 31.9 (28.0-36.9) | 138 (114-170) | 1036 |
| 6–11 years | 37.0 (25.9-52.8) | 6.62† (<LOD-14.2) | 42.2 (21.7-60.2) | 202† (105-290) | 101 |
| 12–19 years | 21.7 (17.2-27.5) | 4.74 (1.98-6.23) | 24.7 (20.8-33.1) | 94.1 (71.7-119) | 190 |
| 20–39 years | 25.8 (21.2-31.4) | 3.41 (<LOD-6.26) | 28.0 (24.0-34.9) | 121 (100-167) | 231 |
| 40–59 years | 30.2 (24.4-37.5) | 3.13 (<LOD-6.83) | 38.0 (30.0-51.0) | 160 (114-216) | 224 |
| 60 years and older | 27.0 (21.1-34.5) | 3.19 (2.17-5.13) | 31.1 (23.8-40.0) | 138 (104-189) | 290 |
| Females | | | | | |
| Total, 6 years and older | 37.4 (34.2-40.9) | 7.08 (4.81-7.92) | 43.1 (38.7-48.7) | 168 (151-196) | 1074 |
| 6–11 years | 33.4 (23.1-48.3) | 6.28† (<LOD-10.0) | 35.5 (27.5-60.6) | 150† (87.0-325) | 95 |
| 12–19 years | 28.7 (23.3-35.3) | 6.14 (3.02-7.64) | 32.1 (26.2-38.8) | 112 (90.2-146) | 185 |
| 20–39 years | 32.8 (27.1-39.8) | 6.46 (3.12-10.7) | 34.9 (27.8-47.5) | 166 (107-235) | 298 |
| 40–59 years | 40.1 (32.3-49.8) | 6.00 (<LOD-14.4) | 48.7 (39.0-58.5) | 165 (129-224) | 209 |
| 60 years and older | 47.2 (39.4-56.7) | 8.54 (6.23-14.9) | 53.0 (46.4-65.3) | 189 (157-225) | 287 |

< LOD means less than the limit of detection for the uncorrected urine value, which may vary for some compounds by year. See Appendix D for LOD.
† Estimate is subject to greater uncertainty due to small cell size.

Table 5.6.a. Urinary enterolactone: Total population

Geometric mean and selected percentiles of urine concentrations (in µg/L) for the total U.S. population aged 6 years and older, National Health and Nutrition Examination Survey, 1999–2002.

| | Geometric mean (95% conf. interval) | Selected percentiles (95% conf. interval) | | | Sample size |
|--------------------------|--|---|---------------|------------------|-------------|
| | | 10th | 50th | 90th | |
| Males and Females | | | | | |
| Total, 6 years and older | 249 (227-273) | 23.6 (19.6-29.5) | 330 (303-370) | 1710 (1500-1960) | 5342 |
| 6–11 years | 297 (251-352) | 55.1 (41.1-73.7) | 340 (288-412) | 1420 (1250-2050) | 727 |
| 12–19 years | 256 (223-294) | 31.5 (22.1-48.0) | 317 (266-377) | 1560 (1250-1900) | 1490 |
| 20–39 years | 237 (203-276) | 20.3 (13.0-28.0) | 317 (255-380) | 1850 (1420-2320) | 1139 |
| 40–59 years | 231 (190-280) | 15.9 (11.0-25.3) | 334 (272-399) | 1810 (1510-2240) | 951 |
| 60 years and older | 276 (245-311) | 32.9 (17.9-50.3) | 362 (303-417) | 1680 (1330-2170) | 1035 |
| Males | | | | | |
| Total, 6 years and older | 258 (234-285) | 21.7 (17.5-25.3) | 349 (310-389) | 1890 (1600-2280) | 2594 |
| 6–11 years | 322 (267-387) | 55.3 (35.8-102) | 363 (309-456) | 1380 (1120-1810) | 368 |
| 12–19 years | 246 (212-287) | 29.6 (19.4-41.7) | 318 (252-391) | 1560 (1250-1820) | 733 |
| 20–39 years | 249 (208-299) | 19.2 (11.2-30.9) | 337 (258-389) | 2050 (1650-2540) | 500 |
| 40–59 years | 246 (194-312) | 16.6 (12.7-25.3) | 360 (278-438) | 1940 (1580-2530) | 480 |
| 60 years and older | 274 (228-330) | 19.9 (12.9-43.2) | 361 (291-458) | 1790 (1410-2470) | 513 |
| Females | | | | | |
| Total, 6 years and older | 241 (215-270) | 25.9 (18.1-38.7) | 321 (281-359) | 1500 (1300-1810) | 2748 |
| 6–11 years | 273 (203-368) | 55.5 (24.0-83.6) | 325 (236-420) | 1520 (847-2280) | 359 |
| 12–19 years | 267 (218-326) | 37.2 (20.1-59.1) | 314 (259-383) | 1500 (1040-2130) | 757 |
| 20–39 years | 225 (181-279) | 21.4 (9.30-38.4) | 312 (239-381) | 1450 (991-2000) | 639 |
| 40–59 years | 217 (164-288) | 15.8 (7.30-44.9) | 311 (227-399) | 1510 (1180-1810) | 471 |
| 60 years and older | 277 (231-333) | 43.4 (18.9-66.5) | 362 (282-419) | 1490 (1190-2140) | 522 |

Table 5.6.b. Urinary enterolactone: Mexican Americans

Geometric mean and selected percentiles of urine concentrations (in µg/L) for Mexican Americans in the U.S. population aged 6 years and older, National Health and Nutrition Examination Survey, 1999–2002.

| | Geometric mean (95% conf. interval) | Selected percentiles (95% conf. interval) | | | Sample size |
|--------------------------|--|---|---------------|------------------|-------------|
| | | 10th | 50th | 90th | |
| Males and Females | | | | | |
| Total, 6 years and older | 236 (198-280) | 32.0 (17.7-40.2) | 316 (266-354) | 1550 (1230-1890) | 1492 |
| 6–11 years | 209 (155-282) | 31.4 (17.7-50.6) | 265 (192-375) | 913 (796-1420) | 226 |
| 12–19 years | 272 (238-312) | 36.6 (29.5-61.7) | 314 (253-370) | 1650 (1350-1990) | 538 |
| 20–39 years | 262 (203-340) | 34.5 (8.76-49.8) | 346 (280-424) | 1840 (1280-2620) | 300 |
| 40–59 years | 192 (149-249) | 12.9 (8.00-35.8) | 245 (200-347) | 1390 (929-2060) | 221 |
| 60 years and older | 197 (137-285) | 23.0 (6.66-50.5) | 296 (180-415) | 967 (825-1490) | 207 |
| Males | | | | | |
| Total, 6 years and older | 253 (200-320) | 32.7 (15.7-46.3) | 346 (266-416) | 1640 (1000-2380) | 722 |
| 6–11 years | 236 (170-328) | 35.1 (24.7-55.1) | 316 (171-476) | 972 (815-1800) | 117 |
| 12–19 years | 236 (210-266) | 34.3 (21.7-55.3) | 293 (210-357) | 1510 (950-1900) | 274 |
| 20–39 years | 317 (225-446) | 39.6 (6.81-79.5) | 455 (280-628) | 2380 (1280-3560) | 127 |
| 40–59 years | 166 (104-265) | 10.4† (4.10-38.8) | 238 (148-389) | 1030† (647-2120) | 105 |
| 60 years and older | 266 (176-402) | 37.2† (6.66-99.7) | 374 (248-488) | 967† (679-2570) | 99 |
| Females | | | | | |
| Total, 6 years and older | 218 (167-285) | 30.2 (11.9-53.2) | 279 (228-344) | 1380 (980-1840) | 770 |
| 6–11 years | 184 (106-319) | 16.8† (<LOD-80.4) | 236 (170-375) | 847† (745-1550) | 109 |
| 12–19 years | 319 (241-422) | 56.1 (19.5-105) | 352 (258-473) | 1710 (1290-2530) | 264 |
| 20–39 years | 209 (134-328) | 17.3 (2.91-77.7) | 308 (183-414) | 1100 (790-2580) | 173 |
| 40–59 years | 224 (159-316) | 19.1 (3.44-58.0) | 245 (193-392) | 1480 (980-2200) | 116 |
| 60 years and older | 154 (96.7-246) | 11.3† (<LOD-43.0) | 231 (148-322) | 920† (524-1490) | 108 |

< LOD means less than the limit of detection, which may vary for some compounds by year. See Appendix D for LOD.

† Estimate is subject to greater uncertainty due to small cell size.

Table 5.6.c. Urinary enterolactone: Non-Hispanic blacks

Geometric mean and selected percentiles of urine concentrations (in µg/L) for non-Hispanic blacks in the U.S. population aged 6 years and older, National Health and Nutrition Examination Survey, 1999–2002.

| | Geometric mean (95% conf. interval) | Selected percentiles (95% conf. interval) | | | Sample size |
|--------------------------|--|---|---------------|-------------------|-------------|
| | | 10th | 50th | 90th | |
| Males and Females | | | | | |
| Total, 6 years and older | 272 (230-322) | 26.3 (17.6-43.6) | 392 (339-441) | 1500 (1270-1890) | 1286 |
| 6–11 years | 369 (297-457) | 75.1 (41.0-99.1) | 470 (391-521) | 1520 (1220-2160) | 249 |
| 12–19 years | 351 (315-391) | 53.9 (34.8-87.3) | 428 (385-479) | 1850 (1450-2340) | 448 |
| 20–39 years | 239 (167-344) | 12.0 (5.40-49.4) | 342 (248-504) | 1680 (993-2300) | 197 |
| 40–59 years | 254 (202-320) | 23.1 (14.5-45.9) | 366 (283-479) | 1350 (1050-1920) | 210 |
| 60 years and older | 237 (179-312) | 15.2 (7.90-44.9) | 399 (296-502) | 1270 (1020-1960) | 182 |
| Males | | | | | |
| Total, 6 years and older | 266 (215-329) | 20.9 (12.0-36.5) | 416 (339-497) | 1630 (1250-2080) | 627 |
| 6–11 years | 362 (304-430) | 65.4 (21.5-107) | 487 (341-524) | 1370 (1070-1720) | 127 |
| 12–19 years | 330 (266-409) | 38.6 (26.3-77.1) | 422 (363-484) | 1770 (1360-2440) | 211 |
| 20–39 years | 261 (163-417) | 17.7† (4.49-116) | 416 (260-596) | 1670† (1000-2500) | 91 |
| 40–59 years | 235 (160-345) | 16.6† (4.20-34.6) | 401 (184-559) | 1350† (741-2580) | 109 |
| 60 years and older | 183 (119-281) | 6.00† (3.30-19.5) | 267 (155-488) | 1290† (1000-1980) | 89 |
| Females | | | | | |
| Total, 6 years and older | 278 (235-327) | 39.1 (18.9-53.2) | 360 (314-427) | 1500 (1190-1870) | 659 |
| 6–11 years | 376 (259-547) | 75.8 (28.7-130) | 416 (299-664) | 1740 (1050-2410) | 122 |
| 12–19 years | 374 (325-431) | 87.3 (39.1-136) | 441 (378-521) | 1870 (1320-2260) | 237 |
| 20–39 years | 224 (152-330) | 9.10† (3.10-49.7) | 314 (219-499) | 1500† (854-2140) | 106 |
| 40–59 years | 272 (218-340) | 43.4† (15.2-71.6) | 358 (246-469) | 1270† (842-1540) | 101 |
| 60 years and older | 281 (197-401) | 32.6† (9.50-102) | 438 (307-565) | 1270† (900-2210) | 93 |

† Estimate is subject to greater uncertainty due to small cell size.

Table 5.6.d. Urinary enterolactone: Non-Hispanic whites

Geometric mean and selected percentiles of urine concentrations (in µg/L) for non-Hispanic whites in the U.S. population aged 6 years and older, National Health and Nutrition Examination Survey, 1999–2002.

| | Geometric mean (95% conf. interval) | Selected percentiles (95% conf. interval) | | | Sample size |
|--------------------------|--|---|---------------|------------------|-------------|
| | | 10th | 50th | 90th | |
| Males and Females | | | | | |
| Total, 6 years and older | 259 (230-291) | 23.9 (18.1-33.1) | 344 (301-387) | 1810 (1580-2100) | 2112 |
| 6–11 years | 308 (244-388) | 57.5 (35.8-103) | 331 (262-412) | 1600 (1290-2310) | 196 |
| 12–19 years | 249 (203-306) | 29.6 (17.5-58.1) | 310 (242-384) | 1620 (1200-2420) | 375 |
| 20–39 years | 235 (196-281) | 19.1 (11.1-33.1) | 317 (240-383) | 1780 (1300-2180) | 529 |
| 40–59 years | 249 (195-319) | 16.4 (9.30-34.1) | 387 (278-424) | 2030 (1610-2750) | 434 |
| 60 years and older | 297 (256-345) | 44.8 (19.9-73.6) | 372 (303-424) | 1730 (1340-2260) | 578 |
| Males | | | | | |
| Total, 6 years and older | 272 (240-308) | 22.9 (17.2-33.1) | 360 (310-400) | 1970 (1620-2450) | 1038 |
| 6–11 years | 336 (257-441) | 70.2† (35.8-152) | 348 (283-474) | 1390† (881-2600) | 101 |
| 12–19 years | 242 (192-306) | 23.2 (10.6-64.4) | 316 (222-445) | 1560 (1150-2180) | 190 |
| 20–39 years | 236 (185-300) | 19.2 (11.0-32.3) | 258 (209-389) | 2000 (1300-2620) | 231 |
| 40–59 years | 290 (218-386) | 17.3 (12.7-39.6) | 424 (307-555) | 2400 (1710-3540) | 225 |
| 60 years and older | 296 (236-372) | 29.6 (12.9-62.1) | 377 (292-492) | 1750 (1310-2730) | 291 |
| Females | | | | | |
| Total, 6 years and older | 246 (212-286) | 25.4 (15.8-43.7) | 328 (280-383) | 1490 (1290-2010) | 1074 |
| 6–11 years | 279 (185-420) | 47.3† (15.7-117) | 325 (224-427) | 1530† (719-2900) | 95 |
| 12–19 years | 257 (189-349) | 45.4 (17.5-62.1) | 286 (222-403) | 1800 (944-2950) | 185 |
| 20–39 years | 234 (176-310) | 17.4 (7.50-43.7) | 323 (238-431) | 1310 (980-1970) | 298 |
| 40–59 years | 214 (148-310) | 13.0 (5.28-46.1) | 347 (206-418) | 1660 (1010-2750) | 209 |
| 60 years and older | 298 (245-363) | 53.0 (19.4-78.0) | 348 (265-418) | 1700 (1190-2240) | 287 |

† Estimate is subject to greater uncertainty due to small cell size.

Table 5.6.e. Urinary enterolactone: Total population (creatinine corrected)

Geometric mean and selected percentiles of urine concentrations (in µg/g creatinine) for the total U.S. population aged 6 years and older, National Health and Nutrition Examination Survey, 1999–2002.

| | Geometric mean (95% conf. interval) | Selected percentiles (95% conf. interval) | | | Sample size |
|--------------------------|--|---|---------------|------------------|-------------|
| | | 10th | 50th | 90th | |
| Males and Females | | | | | |
| Total, 6 years and older | 233 (213-254) | 21.2 (17.4-24.5) | 309 (286-335) | 1500 (1380-1630) | 5342 |
| 6–11 years | 323 (277-375) | 69.3 (41.1-91.9) | 375 (305-423) | 1490 (1190-1780) | 727 |
| 12–19 years | 185 (163-211) | 23.4 (15.2-31.9) | 231 (206-256) | 1110 (908-1330) | 1490 |
| 20–39 years | 190 (163-221) | 14.0 (10.4-20.9) | 278 (240-304) | 1290 (1110-1520) | 1139 |
| 40–59 years | 232 (194-277) | 16.3 (11.7-24.2) | 315 (267-377) | 1630 (1380-1940) | 951 |
| 60 years and older | 331 (286-383) | 37.6 (20.3-65.1) | 437 (380-492) | 1860 (1540-2040) | 1035 |
| Males | | | | | |
| Total, 6 years and older | 208 (190-227) | 17.4 (13.9-21.6) | 279 (254-303) | 1360 (1210-1540) | 2594 |
| 6–11 years | 339 (283-408) | 76.0 (49.3-101) | 397 (291-480) | 1580 (1130-2120) | 368 |
| 12–19 years | 175 (152-201) | 19.0 (12.9-29.6) | 226 (200-247) | 1090 (907-1310) | 733 |
| 20–39 years | 174 (143-210) | 15.1 (10.4-22.6) | 240 (206-276) | 1180 (872-1530) | 500 |
| 40–59 years | 204 (165-253) | 12.3 (8.16-24.2) | 282 (243-350) | 1420 (1150-1850) | 480 |
| 60 years and older | 257 (208-318) | 18.2 (11.4-35.3) | 380 (282-486) | 1590 (1210-1940) | 513 |
| Females | | | | | |
| Total, 6 years and older | 259 (232-290) | 27.9 (18.6-32.9) | 342 (307-379) | 1590 (1440-1800) | 2748 |
| 6–11 years | 306 (237-394) | 55.4 (30.2-126) | 343 (263-401) | 1400 (1110-1610) | 359 |
| 12–19 years | 197 (163-237) | 25.9 (16.2-36.8) | 243 (198-306) | 1150 (850-1490) | 757 |
| 20–39 years | 207 (165-259) | 13.9 (8.20-27.9) | 302 (259-360) | 1370 (1120-1800) | 639 |
| 40–59 years | 261 (204-335) | 18.7 (9.02-39.1) | 355 (267-447) | 1850 (1450-2300) | 471 |
| 60 years and older | 401 (339-474) | 60.5 (30.9-103) | 472 (404-562) | 2020 (1590-2250) | 522 |

Table 5.6.f. Urinary enterolactone: Mexican Americans (creatinine corrected)

Geometric mean and selected percentiles of urine concentrations (in µg/g creatinine) for Mexican Americans in the U.S. population aged 6 years and older, National Health and Nutrition Examination Survey, 1999–2002.

| | Geometric mean (95% conf. interval) | Selected percentiles (95% conf. interval) | | | Sample size |
|--------------------------|--|---|---------------|------------------|-------------|
| | | 10th | 50th | 90th | |
| Males and Females | | | | | |
| Total, 6 years and older | 219 (191-252) | 24.2 (18.6-33.2) | 283 (258-328) | 1270 (1030-1490) | 1492 |
| 6–11 years | 268 (200-359) | 41.3 (20.8-64.7) | 348 (240-437) | 1190 (871-1980) | 226 |
| 12–19 years | 215 (185-250) | 33.0 (18.7-49.5) | 257 (215-296) | 1110 (955-1310) | 538 |
| 20–39 years | 217 (174-270) | 24.2 (9.46-37.2) | 281 (242-398) | 1410 (995-1730) | 300 |
| 40–59 years | 193 (146-254) | 18.1 (6.78-23.3) | 277 (214-371) | 1220 (1020-1430) | 221 |
| 60 years and older | 227 (160-323) | 25.3 (10.0-60.4) | 334 (231-450) | 1200 (985-1800) | 207 |
| Males | | | | | |
| Total, 6 years and older | 208 (169-257) | 22.6 (14.9-36.1) | 264 (227-328) | 1270 (946-1730) | 722 |
| 6–11 years | 284 (191-421) | 41.3 (12.9-83.0) | 355 (217-504) | 1840 (898-2790) | 117 |
| 12–19 years | 178 (152-208) | 19.9 (14.6-43.8) | 233 (184-281) | 939 (716-1150) | 274 |
| 20–39 years | 233 (171-318) | 26.9 (9.46-54.1) | 280 (206-444) | 1570 (868-2190) | 127 |
| 40–59 years | 140 (90.5-216) | 8.37† (3.50-22.6) | 213 (126-282) | 1030† (597-1430) | 105 |
| 60 years and older | 251 (161-390) | 26.8† (3.62-67.2) | 298 (206-503) | 1390† (989-2520) | 99 |
| Females | | | | | |
| Total, 6 years and older | 231 (193-277) | 24.2 (11.1-58.9) | 308 (273-366) | 1280 (1070-1440) | 770 |
| 6–11 years | 252 (166-382) | 28.5† (<LOD-97.1) | 319 (223-455) | 1010† (786-1490) | 109 |
| 12–19 years | 266 (208-339) | 50.2 (18.0-87.9) | 282 (225-373) | 1400 (1030-1630) | 264 |
| 20–39 years | 199 (138-286) | 13.3 (2.46-70.4) | 280 (179-409) | 1220 (981-1650) | 173 |
| 40–59 years | 270 (189-387) | 21.9 (7.00-73.6) | 394 (233-611) | 1480 (1170-2140) | 116 |
| 60 years and older | 209 (135-324) | 21.1† (<LOD-63.0) | 333 (154-422) | 1070† (773-1500) | 108 |

< LOD means less than the limit of detection for the uncorrected urine value, which may vary for some compounds by year. See Appendix D for LOD.

† Estimate is subject to greater uncertainty due to small cell size.

Table 5.6.g. Urinary enterolactone: Non-Hispanic blacks (creatinine corrected)

Geometric mean and selected percentiles of urine concentrations (in µg/g creatinine) for non-Hispanic blacks in the U.S. population aged 6 years and older, National Health and Nutrition Examination Survey, 1999–2002.

| | Geometric mean (95% conf. interval) | Selected percentiles (95% conf. interval) | | | Sample size |
|--------------------------|--|---|---------------|------------------|-------------|
| | | 10th | 50th | 90th | |
| Males and Females | | | | | |
| Total, 6 years and older | 183 (153-220) | 17.9 (12.0-29.9) | 269 (219-309) | 1090 (911-1230) | 1286 |
| 6–11 years | 345 (285-417) | 76.0 (48.1-108) | 429 (331-495) | 1170 (972-1650) | 249 |
| 12–19 years | 197 (176-221) | 32.3 (14.1-53.4) | 244 (215-273) | 931 (804-1180) | 448 |
| 20–39 years | 136 (92.9-199) | 7.64 (3.17-26.6) | 197 (138-288) | 888 (628-1590) | 197 |
| 40–59 years | 172 (134-220) | 15.8 (7.07-28.9) | 251 (181-318) | 1010 (678-1230) | 210 |
| 60 years and older | 222 (167-295) | 15.7 (6.74-56.4) | 341 (252-439) | 1390 (872-1690) | 182 |
| Males | | | | | |
| Total, 6 years and older | 161 (128-202) | 12.0 (7.64-31.9) | 236 (197-278) | 1010 (850-1220) | 627 |
| 6–11 years | 335 (272-413) | 60.3 (38.6-112) | 409 (329-507) | 1100 (937-1570) | 127 |
| 12–19 years | 180 (147-221) | 20.1 (11.8-45.1) | 217 (186-271) | 931 (728-1250) | 211 |
| 20–39 years | 126 (78.3-204) | 7.64† (1.31-32.6) | 177 (125-242) | 1100† (556-1590) | 91 |
| 40–59 years | 143 (97.7-209) | 9.30† (2.81-28.1) | 252 (152-319) | 820† (615-1420) | 109 |
| 60 years and older | 136 (86.0-215) | 7.45† (1.61-15.7) | 220 (128-344) | 885† (705-1470) | 89 |
| Females | | | | | |
| Total, 6 years and older | 205 (172-245) | 28.9 (17.0-37.7) | 298 (241-340) | 1090 (911-1390) | 659 |
| 6–11 years | 356 (270-468) | 88.1 (59.4-126) | 431 (279-552) | 1180 (972-1670) | 122 |
| 12–19 years | 216 (187-250) | 50.3 (24.3-69.9) | 262 (221-298) | 911 (686-1300) | 237 |
| 20–39 years | 144 (96.1-217) | 12.1† (2.05-37.2) | 218 (142-326) | 888† (622-1670) | 106 |
| 40–59 years | 200 (157-256) | 28.4† (7.07-51.5) | 247 (184-354) | 1060† (604-1440) | 101 |
| 60 years and older | 308 (214-443) | 41.0† (17.0-90.6) | 428 (302-549) | 1460† (869-2020) | 93 |

† Estimate is subject to greater uncertainty due to small cell size.

Table 5.6.h. Urinary enterolactone: Non-Hispanic whites (creatinine corrected)

Geometric mean and selected percentiles of urine concentrations (in µg/g creatinine) for non-Hispanic whites in the U.S. population aged 6 years and older, National Health and Nutrition Examination Survey, 1999–2002.

| | Geometric mean (95% conf. interval) | Selected percentiles (95% conf. interval) | | | Sample size |
|--------------------------|--|---|---------------|-------------------|-------------|
| | | 10th | 50th | 90th | |
| Males and Females | | | | | |
| Total, 6 years and older | 257 (229-289) | 22.6 (17.1-27.9) | 338 (308-377) | 1630 (1460-1880) | 2112 |
| 6–11 years | 334 (277-402) | 76.1 (48.9-108) | 378 (291-435) | 1580 (1220-2020) | 196 |
| 12–19 years | 189 (155-229) | 22.8 (15.9-29.6) | 238 (192-288) | 1240 (900-1720) | 375 |
| 20–39 years | 205 (172-243) | 14.5 (9.83-22.6) | 296 (268-323) | 1370 (1160-1640) | 529 |
| 40–59 years | 261 (210-326) | 16.4 (10.2-29.9) | 362 (282-444) | 1850 (1410-2490) | 434 |
| 60 years and older | 371 (310-443) | 44.3 (20.3-96.7) | 468 (386-570) | 1920 (1570-2200) | 578 |
| Males | | | | | |
| Total, 6 years and older | 230 (206-257) | 21.2 (14.6-25.2) | 308 (276-336) | 1520 (1290-1690) | 1038 |
| 6–11 years | 370 (282-484) | 82.0† (69.3-123) | 435 (247-601) | 1780† (1180-2940) | 101 |
| 12–19 years | 184 (146-233) | 19.7 (7.43-31.9) | 238 (189-287) | 1210 (900-1880) | 190 |
| 20–39 years | 179 (141-227) | 14.0 (9.83-24.7) | 251 (201-309) | 1270 (755-1630) | 231 |
| 40–59 years | 244 (189-316) | 16.0 (8.16-29.9) | 327 (254-433) | 1630 (1240-2490) | 225 |
| 60 years and older | 283 (220-364) | 19.6 (13.0-44.7) | 424 (301-576) | 1590 (1170-1980) | 291 |
| Females | | | | | |
| Total, 6 years and older | 287 (247-333) | 27.9 (16.9-37.7) | 370 (327-418) | 1850 (1520-2020) | 1074 |
| 6–11 years | 299 (215-416) | 55.2† (25.1-142) | 342 (249-401) | 1400† (847-1800) | 95 |
| 12–19 years | 194 (147-256) | 21.7 (13.8-36.8) | 241 (172-344) | 1250 (783-1800) | 185 |
| 20–39 years | 233 (174-311) | 14.0 (6.11-30.6) | 322 (280-424) | 1410 (1180-2010) | 298 |
| 40–59 years | 279 (204-383) | 16.9 (6.44-48.4) | 378 (281-532) | 1930 (1450-2560) | 209 |
| 60 years and older | 457 (377-553) | 76.3 (30.9-151) | 513 (404-681) | 2040 (1620-2580) | 287 |

† Estimate is subject to greater uncertainty due to small cell size.

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