United States Department of Agriculture

USDA

Economic Research Service

Technical Bulletin Number 1927

January 2011

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A Report from the Economic Research Service

www.ers.usda.gov

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Abstract

The Food Availability (per capita) Data System developed by USDA's Economic Research Service tracks annual food and nutrient availability for many commodities. The Food Availability data series in this system overstates actual consumption, so ERS has included an additional series, the Loss-Adjusted Food Availability data, to adjust the Food Availability data for nonedible food parts and food losses, including losses from farm to retail, at retail, and at the consumer level. In this report, we propose new consumer-level loss estimates for "cooking loss and uneaten food" of the edible share to replace those currently used in the Loss-Adjusted Food Availability data and propose their adoption for the entire data span (1970 to the most recent year in the series). The proposed loss percentages are calculated by subtracting food consumption estimates from food purchase or availability estimates for each food. These calculations are adjusted with information from an expert panel experienced in analyzing food consumption data. In general, the proposed food loss estimates for individual foods indicate substantial differences from the currently used estimates. Although some estimates indicate smaller loss percentages than the currently used estimates, many are larger. Overall, if the proposed loss estimates are used in the ERS loss-adjusted series, the average American would consume 17.3 pounds less each year, or 41.9 fewer calories per day, than suggested by the currently used loss estimates.

Keywords: Food consumption, food availability, consumer-level food loss, plate waste, NHANES, The Nielsen Company, The Perishables Group, Inc., Homescan

Acknowledgments

This research was conducted under USDA, Economic Research Service Agreement No. 59-4000-6-0121. The authors thank Christine Bruhn (University of California at Davis), Thomas Fungwe (USDA's Center for Nutrition Policy and Promotion), Helen Jensen (Iowa State University), Chery Smith (University of Minnesota), and Parke Wilde (Tufts University) for participating in the expert panel; Ephraim Leibtag and Andrea Carlson (both ERS) for their insights and recommendations; Eric Hengtes (International Life Science Institute), Alanna Moshfegh (USDA's Agricultural Research Service), and Greg Pompelli (ERS) for their reviews; and Michaela Coglaiti (RTI International) for assisting with data collection. Thanks also to John Weber and Cynthia Ray of ERS for editorial and design assistance. All views expressed here are those of the authors and cannot be attributed to RTI International, ERS, or USDA.

Recommended citation format for this publication:

Muth, Mary K., Shawn A. Karns, Samara Joy Nielsen, Jean C. Buzby, and Hodan Farah Wells. *Consumer-Level Food Loss Estimates and Their Use in the ERS Loss-Adjusted Food Availability Data*, TB-1927, U.S. Dept. of Agr., Econ. Res. Serv. January 2011.

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Summary

What Is the Issue?

The Food Availability (per capita) Data System developed by USDA's Economic Research Service (ERS) tracks annual food and nutrient availability (a proxy for consumption) in the United States since 1909 for several hundred commodities. Because the core Food Availability data series in the system overstates actual consumption, ERS has added another series to the system—the Loss-Adjusted Food Availability data—which adjusts the Food Availability data for nonedible food parts and food losses, including losses from farm to retail, at retail, and at the consumer level. This second data series more closely estimates per capita consumption.

The current Loss-Adjusted Food Availability data are incomplete and need updating. Under an agreement with ERS, RTI International has proposed new estimates for the data series' loss of the edible share of food at the consumer level. These proposed estimates cover food loss both at home and away from home for most of the commodities included in the series. These losses include losses during cooking and preparation (e.g., frying fats); discards due to preparation of too much food; expired use-by/open dates; spoilage; and plate waste. ERS then examined how adoption of RTI's proposed estimates in this data series would affect ERS's per capita estimates of daily calories and pounds available for consumption per year for each commodity. Higher loss estimates relative to current ERS loss estimates equate to decreased consumption; lower estimates equate to increased consumption. The purpose of this report is to provide documentation about the proposed estimates and to make these estimates available for public comment. We propose to adopt the new estimates for the entire data span (1970 to the most recent year in the series).

What Did the Study Find?

Proposed loss estimates. Consumer-level food loss varies greatly among individual foods based on a number of factors, such as a food's perishability or shelf life, the likelihood of a food being used as an ingredient or eaten without further preparation, and the degree to which a food is typically consumed by children or adults (because of differences in food consumption patterns across age groups). Based on RTI's proposed estimates, foods with the largest annual increase (more than 35 percentage points) in estimated consumer-level loss as compared with the currently used ERS estimates include fresh pumpkin, dry buttermilk, dry whole and nonfat milk, Swiss cheese, edible beef tallow, and lard. Foods with the largest decrease (more than 15 percentage points) include chicken, lamb, nonfat cottage cheese, frozen potatoes, and veal. Changes in consumer-level food loss estimates could stem from changes in food preparation habits and the increase in food consumed away from home or simply from RTI's use of a different methodology for calculating losses than that used currently by ERS.

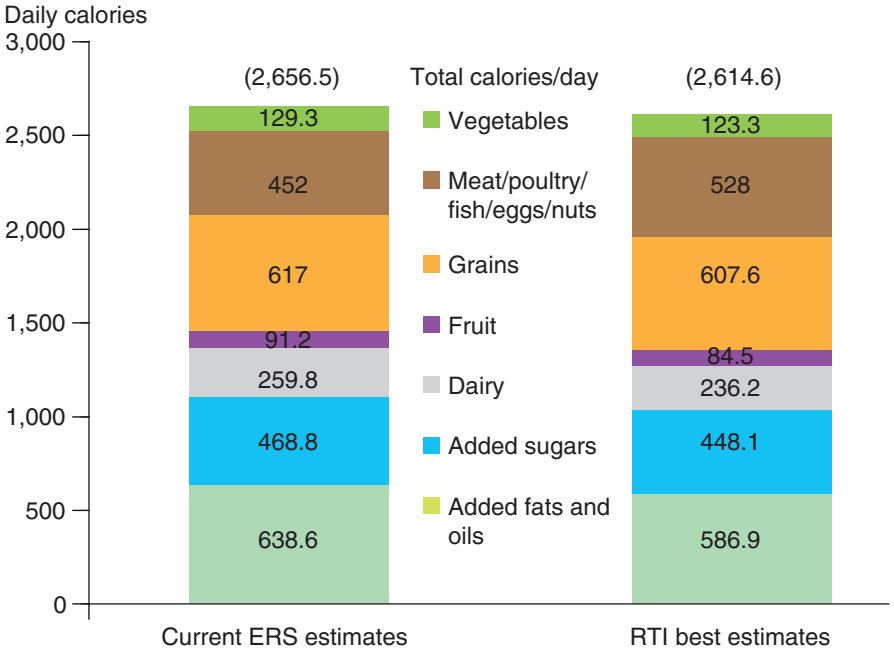
Effects of proposed loss estimates on ERS food availability estimates. If RTI's proposed food loss estimates are adopted for use in ERS's data series, changes in estimates of per capita availability of individual foods relative to current ERS estimates would vary. Changes over entire food groups, however,

would tend to be small. The most affected group would be meat, poultry, fish, eggs, and nuts, with an annual increase in food available for consumption of 22.3 pounds per person, or 15 percent. The food group with the smallest change would be grain products, with an annual decrease in availability of 2.1 pounds per person, or 1.5 percent, though RTI could calculate estimates for only three grain products due to data limitations, such as when the grain was used almost exclusively as an ingredient (e.g., various types of flours). Overall, use of RTI's proposed estimates in the data series would result in a reduction in estimated per capita availability of 17.3 pounds of food per year, or 41.9 fewer calories per day, for the average American.

How Was the Study Conducted?

RTI conducted the first of two phases in this study by comparing estimates of total U.S. retail household purchases with total U.S. at-home consumption for each food in ERS's Loss-Adjusted Food Availability series. The main data sources included The Nielsen Company's Homescan® data for 2004 (food purchases from retail outlets) and the National Health and Nutrition Examination Survey (NHANES) for 2003-04 (food consumption). RTI also calculated alternative estimates of food loss by comparing the total quantity available at the consumer level in the Loss-Adjusted Food Availability series with total reported consumption in NHANES. RTI relied on several supplemental data sources to adjust the purchase data to facilitate comparisons with the consumption data. In addition, RTI took direct measurements of count data (e.g., produce sold by count rather than weight), inedible percentages of food, and moisture gains for foods if data were not available from one of the data sources.

Comparison of daily calories using current ERS and RTI's proposed estimates of consumer-level food loss



Source: Calorie estimates are for 2006 as computed by authors.

RTI also developed and conducted an expert panel to provide additional data for the analysis, including estimates of food loss to validate the RTI estimates (or provide an estimate for foods for which estimates could not be calculated) and estimates of the percentage of each food typically used as an ingredient. Based on the resulting data, RTI provided one recommended or proposed estimate for each food for which an updated estimate could be calculated for use in ERS's Loss-Adjusted Food Availability data.

In the second phase of this study, ERS applied the consumer-level loss estimates proposed by RTI for each commodity to ERS's Loss-Adjusted Food Availability data. Results revealed changes in ERS estimates of the pounds of food available for consumption per capita per year and changes in the number of calories available for consumption per capita per day.

Introduction

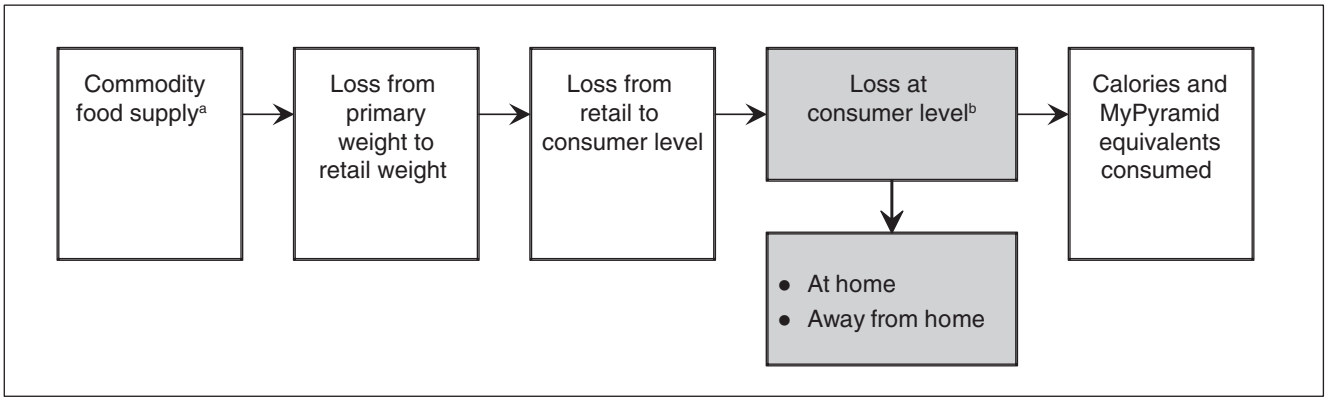
In September 2007, USDA's Economic Research Service established an agreement with RTI International (henceforth, RTI) to propose new conversion factors for loss of the edible share of food at the consumer level for each of the hundreds of commodities covered in ERS's Loss-Adjusted Food Availability data series. The conversion factors include losses for food consumed at home and away from home. The approach to calculating new conversion factors is based on exploratory research conducted by RTI during an earlier stage of the agreement (Muth et al., July 2007). The purpose of this report is to provide documentation about the proposed estimates and to make these estimates available for public comment. We propose to adopt the new estimates for the entire data span (1970 to the most recent year in the series).

This study focuses on food loss that occurs at the consumer level (other than the inedible portion), which is one of three types of food losses estimated in the ERS Food Availability Data System.

Need for Project

ERS's Food Availability (per capita) Data System provides statistical indicators that track food and nutrient availability since 1909 for many commodities. The data can facilitate policymaking and regulatory decisions about nutrition education, public health programs, vitamin and mineral fortification, and food labeling. Currently, the Food Availability data (previously known as the food supply, or food disappearance, data) are the premiere source of time-series data in the Food Availability Data System. However, the data overstate actual consumption, so ERS has included a second series in the system, the Loss-Adjusted Food Availability (LAFA) data, which adjusts the Food Availability data for nonedible food parts and food losses. Three types of loss adjustments are applied to estimates of the food supply to derive loss-adjusted estimates of calories and MyPyramid equivalents consumed per day by individuals (fig. 1). In particular, these three loss adjustments are for (1) loss from primary weight to retail weight, (2) loss from retail to consumer level, and (3) loss at the consumer level.

Figure 1
Loss adjustments applied to the commodity food supply to estimate calories and MyPyramid equivalents consumed



[a]Available commodity food supply is generally calculated as (production + imports + beginning stocks) – (nonfood uses + exports + ending stocks).
[b]Loss at the consumer level accounts for the inedible portion.

Source: RTI International.

The focus of this study is on food losses at the consumer level (other than losses of the inedible share of food, such as apple cores and chicken bones). In particular, these losses include:

- Losses during cooking and preparation (e.g., frying fats)
- Discards due to preparation of too much food, expired use-by/open dates, or spoilage
- Plate waste or loss

These losses occur in the following settings:

- At home: includes foods consumed at home from purchases at grocery stores, warehouse stores, specialty grocery stores, farmers' markets, and other retail food outlets.
- Away from home: includes foods consumed from restaurants, school and company cafeterias, hospitals, nursing homes, catered events, and other foodservice outlets.

In addition to providing estimates closer to actual per capita consumption (e.g., pounds per year), the LAFA data series provides estimates of daily per capita MyPyramid equivalents, or daily allowance as defined by the 2005 *Dietary Guidelines for Americans* (USDHHS and USDA, 2005). These estimates can be compared with Federal dietary recommendations for specific food groups of the U.S. population. The LAFA data also include average daily calories (per capita) available in the U.S. food supply by major food group and individual component foods.

The LAFA data series has incomplete documentation on its several hundred food loss estimates from farm to table, and many of these estimates need to be updated. ERS has several initiatives underway to update and document the loss estimates at all stages, including this current study.[1] The loss estimates currently used by ERS were based on limited information, as described in Kantor (1998) and Kantor et al. (1997). Estimates of consumer-level loss are among the least documented in the series, yet they play a critical role in estimating overall consumption: consumer-level updates are needed for each food/commodity covered in the database. This task of updating the consumer-level losses includes overcoming the following challenges:

- Research, data, and literature on food loss at the consumer level are extremely limited.[2] This was a finding from an earlier study by RTI, which conducted a thorough literature review (see Muth et al., July 2007).
- The consumer-level food loss estimates are complicated in that they include losses for food consumed at home and away from home.
- Hundreds of commodities need updated food loss estimates. Additionally, most fruits and vegetables have up to five types of processing (e.g., fresh, frozen, dried, canned, and juice), each of which needs updated loss estimates. Furthermore, the commodity group for "fresh apples" has a sixth category called "other," which consists mostly of sliced apples.
- Loss factors for foods primarily used as ingredients (e.g., certain fats and oils, like shortening, and grains) are more difficult to estimate and require a different estimation method than that used for other foods.

[1]See documentation for the Loss-Adjusted Food Availability data series (USDA, Economic Research Service, 2010). www.ers.usda.gov./data/foodconsumption/foodguidedoc.htm

[2]Other previous publications on consumer-level food loss include Adams et al. (2005); Buzby and Guthrie (2002); Engstrom and Carlsson-Kanyama (2004); Gallo (1980); Marlette et al. (2005); Reger et al. (1996), and van Garde and Woodburn (1987).

- Researchers run the risk of double counting the nonedible share of food when updating food loss estimates.
- Although the loss estimates go back through 1970 for each food (and type of processing in the case of fruits and vegetables), it is more difficult to update loss estimates for earlier years. To the extent possible, future ERS research may focus on determining whether or how consumer-level food loss estimates have varied over this time period.

The intent of the study was to make the best use of existing data to quantitatively estimate consumer-level food loss while addressing these issues to the extent practicable.

Objectives

The goal of this project is to update the conversion factors for loss of the edible share of food at the consumer level, both at home and away from home, for each covered commodity.

The first goal of this project was to propose new conversion factors for loss of the edible share of food at the consumer level, both at home and away from home, for each covered commodity for the most recent full year of complete data in the Loss-Adjusted Food Availability series. The conversion factors currently used by ERS for the following seven groups of commodities are accessible through Excel files posted on the ERS Web site (www.ers.usda.gov/data/foodconsumption/foodguideindex.htm):

1. Meats, poultry, fish, eggs, and nuts
2. Dairy products
3. Added fats and oils
4. Fruits
5. Vegetables
6. Grains
7. Added sugars and sweeteners

Among the seven Excel files, there are a few hundred covered commodities (e.g., wheat, corn, rye, etc., in the grains file), each with its own spreadsheet. Within the individual spreadsheets, the consumer-level loss factors are provided in the column titled "Other (cooking loss and uneaten food)." Henceforth, these particular loss conversion factors are referred to as the "conversion factor." The specific objective was to propose a conversion factor estimate for each covered commodity for the most recent year of data available. In this first phase of the analysis, RTI also investigated qualitatively why foods have different consumer-level conversion factors.

The second goal of this project was to determine the degree to which adoption of the proposed conversion factor estimates for each food commodity would impact per capita estimates of the annual amount of that food available for consumption and the daily calories. ERS performed this second phase of the analysis. The new estimates proposed here are specifically designed for use in the LAFA data series, so they may not be applicable to other categorizations of foods or estimates of food availability or consumption in other analyses.

Data Sources and Methodology

In developing the methodology to calculate the proposed consumer-level loss conversion factors, RTI relied on two main data sources for consumer-level food purchase estimates and food consumption estimates. In addition to these main data sources, RTI also relied on several supplemental data sources to adjust the purchase data to align with the consumption data. RTI also conducted an expert panel to obtain input on the estimation process and additional data needed for the consumer-level loss estimation process.

Data Sources

The data used in this study include publicly available data from several USDA sources and propriety data from The Nielsen Company and the Perishables Group, Inc.

Main Data Sources for Food Purchases and Food Consumption

The main sources of data in this study are The Nielsen Company's Homescan® data for 2004 (food purchases) and the National Health and Nutrition Examination Survey (NHANES) for 2003-04 (food consumption) (see CDC, 2007). RTI examined the detailed foods included in Homescan and NHANES to develop a definition for each food category that corresponded as closely as possible to the LAFA data descriptions contained in the footnotes of each commodity table. Table 1 lists the food categories included in the analysis (detailed descriptions are provided in appendix A, table A-1). Many of the food categories contain only Universal Product Code (UPC) foods (i.e., with a bar code on the package), while others include both UPC and random-weight foods. Random-weight foods are sold by weight and include some fresh fruits and vegetables, bakery products produced and packaged in the store, and meat products cut and packaged in the store.

The Nielsen Company's Homescan Data for 2004

As described in Muth et al. (February 2007), the Homescan Core panel currently includes 125,000 households in 52 markets and 9 remaining areas in the continental United States. On a weekly basis, the Homescan panel households record purchases of all UPC food products using a handheld scanner once household members return home from food shopping. In past years, a subset of approximately 15,000 households in the core panel also recorded all purchases of random-weight foods. This subset of households is referred to as the Fresh Foods panel.

Homescan households that provide purchase data for at least 10 of the 12 months during a year are included in the "static" sample of households. In 2004, approximately 40,000 of the households in the core panel were included in the static dataset for UPC foods, and approximately 7,500 of the 15,000 households in the Fresh Foods panel were included in the static dataset for random-weight foods. For households in the static datasets that reported data for fewer than 12 months of the year, RTI scaled up the purchase estimates to account for missing months using the methodology described in Zhen et al. (2008); this adjustment increased purchase estimates by 1.5 percent per year on average. Furthermore, RTI applied Nielsen's

Table 1

Food categories in the Food Availability data series

Category	Food		
Meat, poultry, fish	• Beef • Veal • Pork • Lamb • Chicken	• Turkey • Fresh and frozen fish • Fresh and frozen shellfish • Canned salmon • Canned sardines	• Canned tuna • Canned shellfish • Other canned fish • Cured fish
Eggs	• Eggs		
Nuts	• Peanuts • Peanut butter • Snack peanuts • Other peanuts	• Almonds • Hazelnuts (filberts) • Pecans • Walnuts	• Macadamia nuts • Pistachio nuts • Other tree nuts • Coconut
Dairy—Beverages	• Plain whole milk • Plain 2% milk • Plain 1% milk • Skim milk	• Whole flavored milk • Low-fat flavored milk • Buttermilk • Half and Half[1]	• Cream (light cream, heavy cream, and half and half) • Eggnog
Dairy—Other	• Sour cream • Cream cheese • Cheddar cheese • Other American cheese • Provolone cheese • Romano cheese • Parmesan cheese • Mozzarella cheese • Ricotta cheese	• Other Italian cheese • Swiss cheese • Brick cheese • Muenster cheese • Blue cheese • Other miscellaneous cheese • Processed cheese • Processed cheese foods and spreads • Regular cottage cheese	• Low-fat cottage cheese • Regular ice cream • Low-fat ice cream (ice milk) • Frozen yogurt and other miscellaneous frozen products • Refrigerated yogurt • Total evaporated and condensed canned whole and skim milk • Dry whole and nonfat milk • Dry buttermilk
Fats and oils	• Butter • Margarine • Lard	• Edible beef tallow • Shortening	• Salad and cooking oils • Other edible fats and oils
Fruits—Fresh	• Fresh oranges • Fresh tangerines • Fresh grapefruit • Fresh lemons • Fresh limes • Fresh apples • Fresh apricots • Fresh avocados	• Fresh bananas • Fresh blueberries • Fresh cantaloupe • Fresh cherries • Fresh cranberries • Fresh grapes • Fresh honeydew • Fresh kiwi	• Fresh mangoes • Fresh peaches • Fresh pears • Fresh pineapple • Fresh papaya • Fresh plums • Fresh strawberries • Fresh watermelon
Fruits—Canned	• Canned apples and applesauce • Canned apricots • Canned cherries	• Canned peaches • Canned pears • Canned pineapple	• Canned plums • Canned olives
Fruits—Frozen	• Frozen blackberries • Frozen blueberries • Frozen cherries • Frozen raspberries	• Frozen strawberries • Other frozen berries • Frozen apples • Frozen apricots	• Frozen peaches • Frozen plums • Other frozen fruit
Fruits—Dried	• Dried apples • Dried apricots • Dried dates	• Dried figs • Dried peaches • Dried pears[1]	• Dried plums • Raisins

Continued—

Table 1
Food categories—continued

Category	Food		
Fruits—Juices	• Grapefruit juice • Lemon juice • Lime juice	• Orange juice • Apple juice • Cranberry juice	• Grape juice • Pineapple juice • Prune juice
Vegetables—Fresh	• Fresh artichokes • Fresh asparagus • Fresh bell peppers • Fresh broccoli • Fresh brussels sprouts • Fresh cabbage • Fresh carrots • Fresh cauliflower • Fresh celery • Fresh collard greens • Fresh sweet corn	• Fresh cucumbers • Fresh eggplant • Fresh escarole and endive • Fresh garlic • Fresh kale • Fresh head lettuce • Fresh romaine and leaf lettuce • Fresh lima beans • Fresh mushrooms • Fresh mustard greens • Fresh okra	• Fresh onions • Fresh potatoes • Fresh pumpkin • Fresh radishes • Fresh snap beans • Fresh spinach • Fresh squash • Fresh sweet potatoes • Fresh tomatoes • Fresh turnip greens
Vegetables—Canned	• Canned asparagus • Canned snap beans • Canned cabbage (sauerkraut) • Canned carrots	• Canned sweet corn • Canned cucumbers (pickles) • Canned green peas • Canned chile peppers	• Canned tomatoes • Canned mushrooms • Canned potatoes • Other canned vegetables
Vegetables—Frozen	• Frozen asparagus • Frozen snap beans • Frozen broccoli • Frozen carrots	• Frozen cauliflower • Frozen sweet corn • Frozen green peas • Frozen lima beans	• Frozen spinach • Frozen potatoes • Other frozen vegetables
Vegetables—Dried	• Dehydrated onions • Dehydrated potatoes	• Potato chips and shoestring potatoes	• Dry edible beans
Grains	• White and whole wheat flour • Durum flour • Rice	• Rye flour • Corn flour and meal • Corn hominy and grits	• Corn starch • Barley products • Oat products
Added sugars and sweeteners	• Cane and beet sugar • High-fructose corn syrup	• Glucose • Dextrose	• Honey • Edible syrups

[1]Half and half and dried pears were only included in the first phase of the analysis because the Loss-Adjusted Food Availability data for these commodities were not available for 2006.

Source: RTI International.

projection factors (weights) in the dataset to obtain national purchase estimates.

The Homescan data collection process is designed to collect information on all food purchases made by households over the course of a year. However, for a variety of reasons, households might not report all their purchase information. For example, a household may skip reporting purchases for a week or two because of illness or vacation, it may not scan packages for foods that were consumed "on the go," or it may forget to scan minor purchases made at convenience stores. In addition, a household might not report all fresh purchases made at farmers' markets, butcher shops, and bakeries because of the additional burden associated with recording this information.

National Health and Nutrition Examination Survey (NHANES) for 2003-04

As part of an ongoing program of studies designed to assess the health and nutritional status of individuals in the United States, NHANES participants report their food consumption for two 24-hour recall periods. The 2003-04 survey captures information from approximately 10,000 respondents from counties across the United States using two interview formats: in person for the first recall period and via telephone for the second recall period. Respondents reported the quantity of food consumed and the place at which the food was eaten (at home versus away from home). The data are intended to represent the weight of the food consumed and thus exclude the inedible (or refuse) portion. For comparability with The Nielsen Homescan data, researchers used the quantity of food consumed at home for the food-loss calculations.

For fruits and vegetables, NHANES classifies each item consumed based on whether the food was prepared from fresh, canned, or frozen products. If respondents are unsure of how the food was prepared, the item is classified in the Not Further Specified (NFS) category. RTI calculated the total consumption estimate in the NFS categories and then apportioned the estimate into the different forms of preparation based on the percentages of use in the LAFA data. Where applicable, the assumed percentages are documented in the food category descriptions in appendix table A-1.

To calculate total consumption for each food category, RTI used data from the first day of 24-hour recall interviews because (1) individuals likely have similar consumption patterns for both days and it would be difficult to create an average daily consumption value, and (2) some individuals did not complete the second-day interview; thus, the data would not be comparable for individuals that complete 1 versus 2 days. For each category, RTI applied the weights in the dataset to obtain average national daily estimates of consumption and then multiplied this amount by 365 days and the 2004 U.S. population to obtain a national annual estimate of consumption for each food for that year. RTI then converted grams to pounds for comparability with the purchase data.

Comparison of Demographics for Homescan and NHANES

Table 2 provides a comparison of weighted percentages by ethnicity and household income categories for respondents in the static Homescan and NHANES datasets. The weighted percentage of non-Hispanic Whites was higher for Homescan than for NHANES, with offsetting higher weighted percentages of non-Hispanic Blacks, Hispanics, and other/multiracial individuals in NHANES. The weighted percentages for household income indicate that NHANES respondents typically have higher incomes than Homescan respondents. In general, the percentages based on ethnicity and household income are similar enough to provide some confidence that comparisons between Homescan purchases and NHANES consumption are valid. However, some differences may occur if certain types of ethnic populations or income groups purchase and/or consume certain foods more than an average household. For example, if lower income households purchase

Table 2
Comparison of race/ethnicity and income for Homescan households and NHANES respondents (weighted)

	Homescan, 2004	NHANES, 2003-04
	Percent	
Race/Ethnicity		
Non-Hispanic White	75.6	68.7
Non-Hispanic Black	11.0	12.2
Other/Multiracial	3.5	5.8
Hispanic	9.8	13.2
Total	100.0	100.0
Household income		
Under $5,000	1.1	1.6
$5,000–$9,999	3.7	3.5
$10,000–$14,999	6.7	6.6
$15,000–$19,999	7.6	6.1
$20,000–$24,999	10.3	7.1
$25,000–$34,999	15.3	12.3
$35,000–$44,999	13.6	11.5
$45,000–$59,999	15.1	—
$45,000–$64,999	—	17.1
$60,000–$69,999	7.3	—
$65,000–$74,999	—	6.4
$70,000 and over	19.3	—
$75,000 and over	—	26.8
Don't know/refused	—	1.0
Total	100.0	100.0

Note: — means the data range was not available for the series.

Source: RTI International.

fewer fresh fruits and vegetables than higher income households, the data from Homescan households might underestimate total fresh fruit and vegetable purchases relative to that for NHANES participants. However, the survey weights provided in each of the datasets should compensate to some extent for the differences in the characteristics of the households.

Supplemental Data Sources

RTI used the following supplemental data sources to adjust the purchase data to facilitate comparisons with the consumption data:

- **Perishables Group, Inc. purchase estimates for some categories of foods that include random-weight purchases broken out by food category (e.g., meat and poultry, fresh fruits, and fresh vegetables).** Perishables Group compiled these data using a method that appears to capture a larger portion of random-weight purchases than the Homescan method. For categories that match the food categories listed in table 1, RTI replaced the random-weight estimates from Homescan with the estimates from Perishables Group. Because ERS purchased these data beginning in July 2004, RTI used the total annual purchase estimates for the period July 2004 through June 2005 based on the assumption that

purchases in January 2005 through June 2005 should be comparable to the same time period as 2004.

- **USDA National Nutrient Database for Standard Reference (2007).** RTI used this source to convert count data for fresh fruits and vegetables to edible weights and to obtain estimates of inedible percentages (called refuse percentages in the database) for fresh fruits and vegetables sold by weight. The database was also used to convert liquid volumes to weights for such products as milk and juice. Detailed information and estimates are provided in appendix table A-2.
- **United Nations Food and Agriculture Organization, "Food Composition for International Use" (UN/FAO, 1953).** This source was used to obtain estimates of inedible portions for fish and shellfish, which are not contained in the National Nutrient Database for Standard Reference.
- **USDA, ARS Agriculture Handbook No. 102 (USDA/ARS, 1975).** This source was used to convert purchase weights to prepared weights for foods, such as rice and oatmeal, and to obtain estimates of liquid syrup or brine percentages for canned fruits and vegetables. Detailed estimates are provided in appendix table A-3.
- **Direct measurements of count data, inedible percentages, and moisture gains for foods that did not have data available from the sources listed earlier.** For categories of foods not covered in the previous sources, RTI counted numbers of fruits or vegetables in a bunch (e.g., carrots), measured inedible (refuse) percentages for canned fruits and vegetables, and measured weight increases for prepared foods (e.g., rice) versus weights of the same foods at the time of purchase. Detailed estimates are provided in appendix table A-3.

In addition to providing detailed product descriptions, appendix table A-1 provides the final set of assumptions for each food regarding conversion of counts (e.g., one fresh cucumber) and fluid ounces (e.g., for fresh orange juice) to weights, solids in canned foods (e.g., canned potatoes), and inedible percentages. For foods that are often part of mixtures (e.g., fruit juices or canned vegetables), the table indicates if RTI divided mixtures of up to two foods into each of the respective categories.

The main and supplemental sources provide most of the data required to calculate consumer-level food loss with the exception of the percentage of each food used as an ingredient. The quantities of foods purchased as indicated in Homescan include the quantities consumed directly and the quantities used in recipes. Fresh apples, for example, are consumed directly and also used as an ingredient to make apple pie or other baked foods. In calculating consumption quantities from NHANES, RTI focused on the detailed food categories that could be compared directly with Homescan purchase quantities. However, RTI needed to adjust the Homescan purchase quantities to exclude the percentage of each food used as an ingredient. For the purposes of the current study, an expert panel estimated the ingredient percentages using the methodology described in the following section. An alternative approach for estimating the ingredient percentages might use the recipe files in the USDA National Nutrient Database for Standard Reference.

Expert Panel Methodology

In addition to using the data sources described earlier, RTI also developed and conducted an expert panel to provide additional data for the analysis. The primary purposes of the expert panel were to:

- Review the methodology to determine if alternative data sources or approaches might be used and to better understand the characteristics of the data sources that were used.
- Obtain expert estimates of food loss that can be used to validate the estimates or provide an estimate for foods for which estimates could not be calculated.
- Obtain expert estimates of the percentage of each food typically used as an ingredient.

RTI convened the following panel of experts on May 13, 2008, at RTI International in Research Triangle Park, NC:

- Dr. Jean Buzby, Economist, ERS, U.S. Department of Agriculture
- Dr. Christine Bruhn, Consumer Food Marketing Specialist, University of California at Davis
- Dr. Thomas Fungwe, Nutrition Policy Analyst, Center for Nutrition Policy and Promotion, U.S. Department of Agriculture
- Dr. Helen Jensen, Professor, Department of Economics, Iowa State University
- Dr. Chery Smith, Associate Professor, Department of Food Science and Nutrition, University of Minnesota
- Dr. Parke Wilde, Associate Professor, Friedman School of Nutrition Science and Policy, Tufts University

Although the panel members were selected for their general knowledge of the food industry, most indicated particular familiarity with specific food groups. For example, Dr. Bruhn indicated dairy products, fruits, and vegetables; Dr. Fungwe cited fruits and vegetables; Dr. Jensen indicated meat, poultry, and fish; dairy products; grain-based products, and added sugars and sweeteners; and Dr. Smith cited meat, poultry, and fish; fruits; and vegetables.

Appendix C includes the materials used to recruit the panel members and conduct the expert elicitation. RTI began the elicitation with a presentation that provided an overview of consumer-level food loss sources and background information; previous literature on estimates of consumer-level food loss; the methodology for estimating purchase quantities, consumption quantities, and consumer-level food loss percentages; and the exercise to be completed for the expert panel. RTI also reviewed the definitions for each food category. During the presentation, RTI discussed many of the challenges in implementing the methodology and the reasons why Nielsen purchase estimates and NHANES consumption estimates may be imperfect measures.[3] Finally, after reviewing the initial calculated estimates of food loss for each food, the experts provided estimates of the following based on their prior experience with food purchase and consumption practices:

[3]In the discussion section on page 38 of this report, we describe issues concerning the data as discussed during the expert panel.

- Percentages of each food typically used as an ingredient
- Percentages of consumer-level food loss for each food

After the expert panel concluded, RTI entered the estimates into a worksheet and calculated the mean, mediametern, minimum, and maximum estimates of ingredient use and consumer-level food loss percentages for each food. RTI then used these estimates in further calculations.

Overview of the Methodology for Calculating Consumer-Level Loss

RTI calculated consumer-level conversion factors using the steps outlined in figure 2, which indicates the data source for each calculation.[4] Food-specific adjustments made during the calculations are detailed in appendix table A-1. Note that for foods sold with UPCs and as random weight, RTI summed the purchase quantities prior to comparing the estimate with the consumption quantity. After calculating the consumer-level food loss estimates in steps 1 through 4, RTI compared the estimates with the loss estimates currently used by ERS, the average expert panel loss estimates, and loss estimates calculated by comparing ERS's estimate of the per capita quantity available to consumers (multiplied by the population) with NHANES consumption estimates. This latter estimate includes consumer-level losses that occur at home and at restaurants and other foodservice operations. The amount of consumer-level food loss at home differs from that away from home, and it is uncertain as to which might be greater. Households may have greater amounts of food loss due to cooking loss and spoilage loss of perishables foods, but restaurants and other foodservice operations are likely to have greater amounts of food loss due to discarded cooking fats and oils and plate waste (Muth et al., July 2007). For the purposes of this study, RTI assumed that the differences offset each other so that losses for food consumed at home are similar to losses for foods consumed away from home.

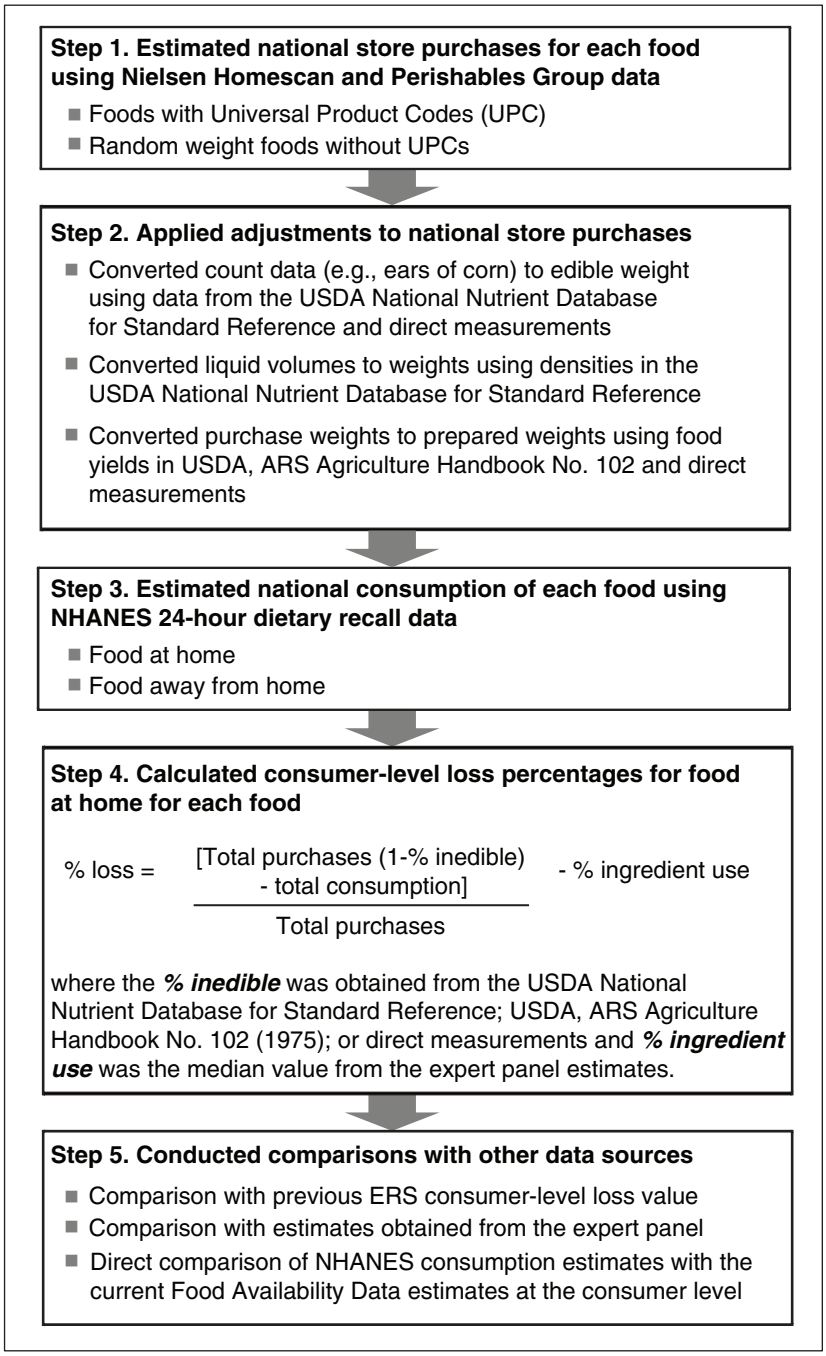
[4]An underlying assumption in the calculations depicted in figure 2 is that consumer-level loss of foods consumed directly as an ingredient is similar to consumer-level loss of foods consumed as an ingredient in prepared foods (e.g., loss of apples consumed directly is similar to loss of apples in apple pie).

The following example using pistachio nuts illustrates RTI's process for calculating consumer-level loss. Based on the Nielsen purchase data, 63.9 million pounds of pistachio nuts were purchased in the United States in 2004, of which 10.2 million pounds were random weight. Supplementary data on random-weight purchases from the Perishables Group were not available for pistachio nuts, so the analysis relied exclusively on Nielsen purchase data to estimate purchase volumes. RTI adjusted the Nielsen purchase estimates to account for the estimated 47-percent inedible portion for pistachio nuts purchased in the shell. Based on the NHANES consumption data, 26.0 million pounds of pistachio nuts were consumed in the United States in 2004, of which 24.9 million pounds were consumed from store purchases. A comparison of Nielsen purchases (63.9 million pounds) with NHANES consumption from store purchases (26.0 million pounds) indicates an unadjusted loss estimate of 61 percent. After subtracting the portion used as an ingredient (43 percent), the resulting loss estimate is 19 percent.

RTI then compared these estimates to other possible estimates. Specifically, a comparison of ERS LAFA data at the consumer level (58.5 million pounds) with total NHANES consumption (26.0 million pounds) indicates an unadjusted loss estimate of 56 percent. After subtracting the portion used as an

ingredient (43 percent), the resulting loss estimate is 13 percent. Both of the calculated estimates of 19 percent and 13 percent are similar to the loss estimate of 10 percent currently used by ERS and the expert panel average estimate of 12 percent. The final proposed loss estimate of 16 percent is the average of the two estimates.

Figure 2
Steps in the process for calculating consumer-level food loss conversion factors[a]



[a]For foods sold with UPCs and as random weight, purchase quantities were added together in step 1.

Source: RTI International.

Proposed Consumer-Level Loss Estimates

Using the methodology described in the previous section, RTI calculated estimates of consumer-level food loss conversion factors for the foods in ERS's LAFA data series. Because RTI has multiple estimates for most foods, it provided ERS with one recommendation or proposed estimate for the value to be used for each food. If an alternative method of estimating percentages of ingredient use is developed, many of the estimates proposed here may need to be revised.

Because we have multiple estimates of the value of the consumer-level loss conversion factor for each food, we provide a recommendation for the value to use in each case for which we have plausible values.

In some cases for which a plausible consumer-level food loss conversion factor was not available based on the calculations, RTI proposed using estimates from other similar foods (from either a single food or an average of several foods).[5] In other cases (e.g., milk), RTI was unable to propose an updated estimate of consumer-level food loss because, in part, consumers appear to overstate consumption in NHANES and no other foods were similar enough to use for the estimate. Estimates for these foods may need to be updated using an alternative method, if developed, or the average of the experts' estimates.

It is important to note that the estimates calculated using the Nielsen (or Nielsen + Perishables) data provide an estimate for at-home food consumption, while the estimates using LAFA data provide an estimate for all consumption (at home and away from home). Based on interviews with restaurant and foodservice operators, spoilage and cooking losses are likely higher at home than away from home, but plate waste is likely lower (Muth et al., July 2007). Thus, RTI assumed these effects balance out such that, in theory, the consumer-level food loss is similar for both. However, in practice, differences in the quality and representativeness of the data result in different estimates that might or might not be plausible for each food.

[5]In this report, we use the terms "plausible," "implausible," and "somewhat reasonable" based on our subjective assessment from working on the food consumption data. For example, a calculated loss estimate of 85 percent for fresh mustard greens (see appendix table B-5 for calculation steps) was considered too high to be plausible because consumers would not likely buy fresh mustard greens and discard the inedible share and 85 percent of the edible share. Therefore, the more reasonable loss estimate of 24 percent for fresh lettuce was applied to fresh mustard greens. In general, negative loss estimates and loss estimates above 50 percent were considered implausible with very few exceptions, such as fresh pumpkin, which has other nonfood uses.

Meat, Poultry, Fish, Eggs, and Nuts

Table 3 provides the estimate currently used by ERS and the proposed estimate of consumer-level food loss conversion factors for meat, poultry, fish, eggs, and nuts. These foods are grouped together as featured or illustrated in USDA's Food Guide Appendix A-2 of the 2005 *Dietary Guidelines for Americans*. Details of the calculations and an explanation of the proposed estimates are provided in appendix table B-1. Most of the proposed estimates of consumer-level food loss conversion factors for meat, poultry, and fish were obtained using Nielsen or Nielsen+Perishables Group purchase estimates. RTI assumed most meat, poultry, and fish would be reported by NHANES respondents as the consumed item; thus, the selected estimates were not adjusted for ingredient use. However, consumers may purchase raw meat and poultry and prepare it for consumption in mixed dishes. To the extent that NHANES respondents report consumption of mixed dishes prepared with meat and poultry that are not separately reported, the loss estimates may be somewhat overstated.

Each of the data sources used has advantages and disadvantages in terms of data quality and comprehensiveness.

RTI used the estimate for beef for veal and lamb because the estimates for veal and lamb were not plausible (most likely because of measurement error associated with low per capita consumption of these foods). Likewise, RTI

Table 3
Consumer loss estimates for meat, poultry, fish, eggs, and nuts

Category	Food	Previous consumer loss estimate	Proposed consumer loss estimate
		Percent	
Meat, poultry, and fish	Beef	32	20
	Veal	35	20
	Pork	39	29
	Lamb	36	20
	Chicken	40	15
	Turkey	32	35
	Fresh and frozen fish	33	40
	Fresh and frozen shellfish	33	40
	Canned salmon	10	17
	Canned sardines[a]	10	36
	Canned tuna	10	17
	Canned shellfish[a]	10	17
	Other canned fish[a]	10	17
	Cured fish	10	17
Eggs	Eggs	15	23
Nuts	Peanuts, snack peanuts, other peanuts	10	4
	Peanut butter	10	14
	Almonds	10	21
	Hazelnuts (filberts)[a]	10	20
	Pecans	10	14
	Walnuts	10	18
	Macadamia nuts[a]	10	8
	Pistachio nuts	10	16
	Other tree nuts	10	18
	Coconut[a]	10	10

[a]Food has 10 or fewer consumption observations in NHANES (National Health and Nutrition Examination Survey); thus, the total consumption estimate may not be reliable.

Source: RTI International.

used the same estimate for fresh and frozen fish as for fresh and frozen shellfish, and the same estimate for canned tuna, canned shellfish, other canned fish, and cured fish as for canned salmon. Finally, for eggs, RTI used the LAFA estimate at the consumer level adjusted for ingredient use because eggs are frequently used as an ingredient and thus would be reported as consumed in other foods.

In general, the estimates for red meats and chicken are substantially lower than the estimates currently used by ERS. This result is expected because meat and poultry products are trimmed closer, many more products are sold boneless, and ground products tend to have lower fat percentages than in earlier time periods. Thus, smaller portions of these foods are likely discarded during preparation or consumption. For meats and poultry, only the loss estimate for turkey (35 percent) is higher than the current estimate

(32 percent), but the difference is relatively small. The estimate for turkey is higher than for chicken (15 percent), possibly because turkey is more often eaten during holidays when consumers may tend to discard relatively more uneaten food than on other days. Estimates for fresh, frozen, and canned seafood and for eggs are somewhat higher than the current estimates.

Most of the consumer-level estimates for nuts are based on the LAFA data adjusted for ingredient use. Estimates based on Nielsen data may be slightly less reliable because a portion of nuts are purchased as random weight, and Perishables Group data for this category were not available. However, for peanuts, snack peanuts, and other peanuts, use of Nielsen data resulted in a somewhat reasonable estimate of 4 percent. RTI also used an average of the estimates calculated using Nielsen and the LAFA data for peanut butter, pistachio nuts, and coconuts because the estimates were similar. Because a reasonable estimate could not be obtained directly for walnuts, RTI took an average of other tree nuts (almonds, hazelnuts, and pecans); RTI also applied this average estimate to "other tree nuts."

The proposed estimates of consumer-level loss for nuts are somewhat higher than current estimates with the exception of that for macadamia nuts, which is slightly lower, and coconuts, which is the same. The estimates for almonds, hazelnuts, walnuts, and other tree nuts increased by the largest amount, but all of the loss estimates are 21 percent or less.

Dairy Products

Table 4 provides the current ERS estimate and the proposed estimate of consumer-level food loss conversion factors for liquid dairy products (i.e., milk) and for other types of dairy products, including cheese, yogurt, and ice cream. Details of the calculations and an explanation of the proposed estimates are provided in appendix table B-2.

Calculating estimates for liquid dairy products is particularly challenging for two reasons. First, some milk purchases may be unrecorded in Homescan because panelists may not report midweek purchases (purchases at times other than the primary shopping trip), which likely include milk. Second, NHANES respondents may overstate their milk consumption, or that of their children, because they know that milk is desirable from a health perspective. Thus, several estimates of consumer-level food loss in the dairy category are considered to be "unreliable."

Based on the LAFA data, RTI was able to provide an estimate for low-fat flavored milk, buttermilk, cream, and eggnog, but the estimates are highly variable. Furthermore, the loss estimates indicate substantially higher percentages of loss than current estimates. In particular, the loss estimates indicate that a substantial portion of eggnog and low-fat flavored milk are discarded or spoil before consumption. Given the seasonal nature of eggnog and that flavored milks are most often consumed by children, these estimates may be plausible. Because RTI was not able to calculate a plausible estimate for whole flavored milk, it used the estimate for low-fat flavored milk.

In the case of plain whole milk, it may be possible to derive a plausible estimate of consumer-level loss if a more accurate estimate for ingredient

Table 4

Consumer loss estimates for dairy products

Category	Food	Previous consumer loss estimate	Proposed consumer loss estimate
		Percent	
Dairy—Beverages	Plain whole milk	20	TBD
	Plain 1% and 2% milk	20	NA
	Skim milk	20	NA
	Whole flavored milk	20	45
	Low-fat flavored milk	20	45
	Buttermilk	20	18
	Light cream, heavy cream, half & half	20	12
	Eggnog	20	51
Dairy—Other	Sour cream	20	8
	Cream cheese	20	13
	Cheddar cheese	13	11
	Other American cheese	13	28
	Provolone cheese	13	14
	Parmesan and Romano cheese	13	8
	Mozzarella cheese	13	31
	Ricotta cheese[a]	13	12
	Other Italian cheese[a]	13	16
	Swiss cheese	13	50
	Brick cheese	13	40
	Muenster cheese	13	35
	Blue cheese	13	43
	Other miscellaneous cheese[a]	13	42
	Processed cheese	13	8
	Processed cheese foods and spreads	13	8
	Regular cottage cheese	20	31
	Low-fat cottage cheese	20	4
	Regular ice cream	20	24
	Low-fat ice cream (ice milk)	20	24
	Frozen yogurt and other miscellaneous frozen products	20	33
	Refrigerated yogurt	20	21
	Total evaporated and condensed canned whole and skim milk	20	15
	Dry whole and nonfat milk	1	41
	Dry buttermilk[a]	1	41

NA = not available; TBD = to be decided; reasonable estimate might be calculable if ingredient percentage is revised.

[a] Food has 10 or fewer consumption observations in NHANES (National Health and Nutrition Examination Survey); thus, the total consumption estimate may not be reliable.

Source: RTI International.

use can be derived. This estimate might also be a reasonable approximation for skim milk and plain 1 percent and 2 percent milk, but RTI expects the estimate for whole milk to be higher because it is frequently consumed by children.

Most of the estimates for other dairy products are based on the LAFA data, but a few are based on Nielsen data. Some are calculated based on estimates for other categories. In particular, "other" Italian cheese is calculated as an average of provolone, parmesan and Romano, mozzarella, and ricotta; and "other" miscellaneous cheese is calculated as an average of Swiss, brick, Muenster, and blue cheese. Furthermore, in place of implausible estimates, RTI used the estimate for processed cheese for processed cheese foods and spreads; the estimate for regular ice cream for low-fat ice cream; and the estimate for dry whole and nonfat milk for dry buttermilk. The implausible estimates may be due to a low number of respondents for those foods in NHANES.

Although some of the estimates for other dairy products are higher than the estimates currently used by ERS, many are somewhat lower. In particular, estimates for sour cream, cream cheese, processed cheese, and low-fat cottage cheese decreased substantially, while estimates for cheeses, such as mozzarella, Swiss, brick, Muenster, and blue, increased substantially. Estimates for cheddar cheese, ricotta cheese, regular and low-fat ice cream, and refrigerated yogurt are similar to the current estimates. Estimates for dry whole and nonfat milk are much larger, but the difference may be due to estimation of the loss in its liquid equivalent in contrast to the dry equivalent for the current estimate.

Added Fats and Oils (Excluding Dairy)

Table 5 provides the current ERS estimate and RTI's proposed estimate of consumer-level food loss conversion factors for added fats and oils, including butter, margarine, shortening, and cooking oils. Details of the calculations and an explanation of the proposed estimates are provided in appendix table B-3. Estimates for butter and margarine are identical at 35 percent, with the estimates also being the same for margarine for both the Nielsen and LAFA data. Thus, RTI has a high degree of confidence that this value is correct,

Table 5
Consumer loss estimates for added fats and oils

Category	Food	Previous consumer loss estimate	Proposed consumer loss estimate
		Percent	
Fats and oils	Butter	15	35
	Margarine	15	35
	Lard	0	35
	Edible beef tallow	0	35
	Shortening	15	35
	Salad and cooking oils	20	15
	Other edible fats and oils	0	25

Source: RTI International.

although it is substantially higher than the current estimate of 15 percent. In contrast, the loss estimate for salad and cooking oils declined from the current estimate of 20 percent to 15 percent using the estimate based on the LAFA data. RTI was unable to calculate an estimate for lard, edible beef tallow, and shortening because direct consumption of these foods is not reflected in NHANES and it was impractical to estimate consumption as an ingredient in thousands of foods. Thus, RTI proposes applying the estimate for margarine to these foods. For "other" edible fats and oils, RTI proposes using an average of the estimates for margarine and salad and cooking oils, which results in an estimate of 25 percent (current estimate was 0 percent).

Fruits

Table 6 provides the current ERS estimate and the RTI's proposed estimate of consumer-level food loss conversion factors for fruits in all forms, including fresh, canned, frozen, dried, and juices. Details of the calculations and an explanation of the proposed estimates are provided in appendix table B-4.

Estimates for fresh fruits were obtained using Nielsen, Perishables Group, and the LAFA data or by applying estimates from other categories. Plausible estimates were initially chosen from those based on the Nielsen and Perishables Group data or the LAFA data. In cases where the initial estimates were implausible, RTI applied an estimate from a similar fresh fruit.

For example, RTI used the estimate for fresh cantaloupe for fresh honeydew. In two cases—fresh apples and fresh bananas—RTI believes it would be possible to obtain a plausible estimate of consumer-level loss with a more reliable estimate of ingredient use. If a plausible estimate can be calculated for fresh apples, RTI proposes also applying the same value to fresh pears.

Many of the estimates, such as those for fresh apricots, fresh blueberries, fresh mangoes, and fresh watermelon, decreased relative to the current estimates. Most of these fruits have somewhat longer shelf lives than other fruits, so lower values are expected for these fruits. Estimates for other fruits, such as fresh avocados, fresh cherries, fresh honeydew, fresh kiwi, fresh peaches, and fresh strawberries, increased substantially. Fruits that are more perishable (e.g., avocados, peaches, and strawberries) are expected to have higher consumer-level loss estimates because they are more likely to spoil prior to consumption.

Most of the estimates for canned fruits are based on Nielsen data because Nielsen estimates purchases for UPC-only foods more reliably than for foods that are also sold as random weight. However, the estimate for canned apricots is based on the LAFA data because the estimate based on the Nielsen data was not plausible. RTI proposes applying the value for canned pineapple for canned peaches and canned pears because estimates using either the Nielsen or LAFA data are not plausible. Although the estimates for canned apples and applesauce, canned peaches, canned pears, and canned pineapple are similar to current estimates, the estimates for other canned fruits increased substantially. The other canned fruits with higher estimates are not typically packaged in single-serve containers, which may contribute to

Table 6

Consumer loss estimates for fruits

Category	Food	Previous consumer loss estimate	Proposed consumer loss estimate
		Percent	
Fruits—Fresh	Fresh oranges	20	36
	Fresh tangerines	20	52
	Fresh grapefruit	20	54
	Fresh lemons	20	44
	Fresh limes[a]	20	44
	Fresh apples	20	TBD
	Fresh apricots[a]	20	10
	Fresh avocados	20	32
	Fresh bananas	20	TBD
	Fresh blueberries	20	8
	Fresh cantaloupe	20	43
	Fresh cherries	20	51
	Fresh cranberries[a]	20	26
	Fresh grapes	20	33
	Fresh honeydew	20	43
	Fresh kiwi	20	45
	Fresh mangoes	20	13
	Fresh peaches	35	42
	Fresh pears	20	TBD
	Fresh pineapple	20	37
	Fresh papaya[a]	20	20
	Fresh plums	20	27
	Fresh strawberries	20	35
	Fresh watermelon	20	13
Fruits—Canned	Canned apples and applesauce	10	8
	Canned apricots[a]	10	27
	Canned cherries[a]	10	32
	Canned peaches	10	9
	Canned pears	10	9
	Canned pineapple	10	9
	Canned plums[a]	10	26
	Canned olives	10	25
Fruits—Frozen	Frozen blackberries	10	40
	Frozen blueberries[a]	10	29
	Frozen cherries[a]	10	29
	Frozen raspberries[a]	10	24
	Frozen strawberries[a]	10	24
	Other frozen berries[a]	10	30
	Frozen apples[a]	10	35
	Frozen apricots[a]	10	35
	Frozen peaches[a]	10	35
	Other frozen fruit[a]	10	35

Continued—

Table 6
Consumer loss estimates for fruits—continued

Category	Food	Previous consumer loss estimate	Proposed consumer loss estimate
		Percent	
Fruits—Dried	Dried apples[a]	10	11
	Dried apricots[a]	10	11
	Dried dates[a]	10	25
	Dried figs[a]	10	25
	Dried peaches[a]	10	11
	Dried pears[a]	10	11
	Dried plums	10	11
	Raisins	10	26
Fruits—Juices	Grapefruit juice	10	NA
	Lemon juice	10	NA
	Lime juice	10	NA
	Orange juice	10	NA
	Apple juice	10	NA
	Cranberry juice[a]	10	NA
	Grape juice	10	NA
	Pineapple juice	10	NA
	Prune juice	10	32

NA = not available; TBD = to be decided; reasonable estimate might be calculable if ingredient percentage is revised.
[a] Food has 10 or fewer consumption observations in NHANES (National Health and Nutrition Examination Survey); thus, the total consumption estimate may not be reliable.

Source: RTI International.

greater consumer-level food loss due to discards of uneaten food or spoilage of opened containers.

Estimates for frozen fruits are based primarily on the LAFA data or assumed values from other categories. Only the estimate for frozen raspberries is plausible when based on the Nielsen data. RTI proposes using the estimate for frozen blueberries for frozen cherries and the estimate for frozen peaches for frozen apples, frozen apricots, and other frozen fruits because the calculated estimates were implausible. All of the estimates for frozen fruits increased substantially from current estimates. However, for this category as a whole, few NHANES respondents reported consuming each food. Thus, the estimates may be less reliable than for foods consumed more frequently.

As with frozen fruits, few NHANES respondents reported consuming each type of dried fruit, but the estimates are generally closer to current estimates. The estimates for dried dates, dried plums, and raisins are based on the Nielsen data. RTI proposes using the estimate for dried plums for dried apples, dried apricots, dried peaches, and dried pears and the estimate for dried dates for dried figs. The estimates increased relative to the current estimates for dried dates, dried figs, and raisins but are very similar for all other dried fruits.

The final category in table 6 is fruit juices, but a plausible estimate could be calculated only for prune juice.[6] Adjustments were required to compare the juice purchase data with the juice consumption data. Specifically, RTI adjusted the purchase data from fluid ounces to weight ounces based on the density of each juice type and calculated the total reconstituted juice volume for concentrates. Furthermore, RTI scrutinized product categories in both the purchase and consumption data to exclude juice drinks (i.e., flavored fruit drinks and other products that are not 100 percent juice). However, these adjustments and the selection of products did not result in comparable purchase and consumption estimates. For most of the categories (grapefruit juice, lemon juice, lime juice, orange juice, and apple juice), NHANES respondents appear to be overstating consumption possibly because fruit juices are viewed as healthful foods, or they may be unable to accurately estimate the amount of liquid consumed. Thus, using either the Nielsen or LAFA data results in estimates with the incorrect sign in appendix table B-2. In contrast, consumption of grape juice and cranberry juice by NHANES respondents appears to be so small compared with that reflected in Nielsen or LAFA data that the estimates are implausible. The only plausible fruit juice estimate of 32 percent for prune juice is based on the Nielsen data; this estimate suggests a much greater percentage of loss than the 10-percent estimate currently used by ERS.

[6]The detailed estimates for juice, which were not proposed for use by RTI, are provided in appendix table B-4.

Vegetables

Table 7 provides the current ERS estimate and the proposed estimate of consumer-level food loss conversion factors for vegetables in various forms, including fresh, canned, frozen, and dry (or dehydrated). Details of the calculations and an explanation of the proposed estimates are provided in appendix table B-5.

Estimates for fresh vegetables were obtained using Nielsen, Perishables Group, and LAFA data or by applying estimates from other categories. Plausible estimates were initially chosen from those based on the Nielsen and Perishables Group data or the LAFA data. In cases where the initial estimates were implausible, RTI applied an estimate from a similar fresh vegetable. In particular, RTI used the estimate for fresh artichokes for fresh asparagus; fresh broccoli for fresh brussels sprouts and fresh cauliflower; fresh lettuce (includes leaf lettuce, romaine, escarole, and endive) for fresh cabbage, fresh kale for fresh collard greens, fresh mustard greens, and fresh turnip greens; and fresh onions for fresh garlic. In a few cases, RTI used the estimate for a different form of the vegetable because no other fresh vegetables are similar; these substitutions include frozen lima beans for fresh lima beans, and frozen snap beans (also called green or string beans) for fresh snap beans. However, spoilage is likely higher for the fresh form versus the frozen form. In two cases—fresh sweet corn and fresh okra—RTI believes it would be possible to obtain a plausible estimate of consumer-level loss with a more accurate estimate of ingredient use; however, RTI was not able to recommend a consumer loss estimate based on the available data.

As with other food categories, many of the consumer loss estimates for fresh vegetables increased somewhat from the estimates currently used by ERS. The largest increases in the estimates are for fresh bell peppers, fresh

Table 7

Consumer loss estimates for vegetables

Category	Food	Previous consumer loss estimate	Proposed consumer loss estimate
		Percent	
Vegetables—Fresh	Fresh artichokes[a]	20	18
	Fresh asparagus[a]	20	18
	Fresh bell peppers	20	39
	Fresh broccoli	20	12
	Fresh brussels sprouts	20	12
	Fresh cabbage	20	24
	Fresh carrots	20	34
	Fresh cauliflower	20	9
	Fresh celery	20	39
	Fresh collard greens	20	38
	Fresh sweet corn	32	TBD
	Fresh cucumbers	20	32
	Fresh eggplant[a]	27	26
	Fresh garlic[a]	20	43
	Fresh kale[a]	20	38
	Fresh romaine and leaf lettuce and escarole and endive[a]	20	24
	Fresh lima beans[a]	20	27
	Fresh mushrooms	20	21
	Fresh mustard greens[a]	20	38
	Fresh okra	20	TBD
	Fresh onions	35	43
	Fresh potatoes	30	16
	Fresh pumpkin[a]	20	69
	Fresh radishes	20	47
	Fresh snap beans	22	24
	Fresh spinach	20	9
	Fresh squash	20	25
	Fresh sweet potatoes	31	44
	Fresh tomatoes	20	7
	Fresh turnip greens[a]	20	38
Vegetables—Canned	Canned asparagus[a]	10	2
	Canned snap beans	10	24
	Canned cabbage (sauerkraut)	10	16
	Canned carrots[a]	10	31
	Canned sweet corn	10	7
	Canned cucumbers (pickles)	10	3
	Canned green peas[a]	10	24
	Canned chile peppers	10	4
	Canned tomatoes	10	28
	Canned mushrooms[a]	10	9
	Canned potatoes[a]	10	28
	Other canned vegetables[a]	10	16

continued—

Table 7
Consumer loss estimates for vegetables—continued

Category	Food	Previous consumer loss estimate	Proposed consumer loss estimate
		Percent	
Vegetables—Frozen	Frozen asparagus	30	26
	Frozen snap beans	20	24
	Frozen broccoli	16	12
	Frozen carrots[a]	12	34
	Frozen cauliflower[a]	17	27
	Frozen sweet corn	14	36
	Frozen green peas[a]	17	24
	Frozen lima beans	32	27
	Frozen spinach	23	34
	Frozen potatoes	32	16
	Other frozen vegetables[a]	23	26
Vegetables—Dried	Dehydrated onions	10	4
	Dehydrated potatoes	10	4
	Potato chips and shoestring potatoes	10	4
	Dry edible beans	10	NA
	Dry edible peas and lentils	10	NA

NA = not available; TBD = to be decided; reasonable estimate might be calculable if ingredient percentage is revised.
[a] Food has 10 or fewer consumption observations in NHANES (National Health and Nutrition Examination Survey); thus, the total consumption estimate may not be reliable.

Source: RTI International.

celery, fresh collard greens, fresh garlic, fresh kale, fresh mustard greens, fresh pumpkin, fresh radishes, and fresh turnip greens. Larger estimates are likely plausible for foods that are often used for flavoring or garnishes and for seasonal foods, such as fresh greens and fresh pumpkins. The largest decreases in the estimates are for fresh broccoli (and thus fresh cauliflower), fresh brussels sprouts, fresh potatoes, fresh spinach, and fresh tomatoes. Changes in packaging and shelf life may play a factor in lower estimates for these foods across periods.

Several of the estimates for canned vegetables are based on Nielsen data because Nielsen estimates purchases of UPC-only foods more reliably than foods that are also sold random weight; a few of the estimates for canned vegetables are based on the LAFA data. The estimate for canned snap beans is used for canned green peas. Furthermore, the estimate for canned cabbage (i.e., sauerkraut) is based on an average of all canned vegetables for lack of a plausible estimate, and the estimate for "other" canned vegetables is also based on an average of all canned vegetables. While some of the estimates increased from current estimates (e.g., canned carrots, canned green peas, canned tomatoes, and canned potatoes), several decreased (canned asparagus, canned sweet corn, pickles, canned chili peppers, and canned mushrooms).

As with loss estimates for canned vegetables, several of the estimates for frozen vegetables are based on Nielsen data, and a few are based on the LAFA data. Because calculated values for frozen carrots, frozen green beans, and frozen potatoes are implausible, RTI proposed other values to use. In particular, RTI proposes using the value for fresh carrots for frozen carrots, frozen snap peas for frozen green peas, and fresh potatoes for frozen potatoes. However, spoilage may be higher for fresh forms of carrots and potatoes; thus, the estimates may overstate actual consumer-level food loss. The estimate for "other" frozen vegetables is calculated as the average of all other frozen vegetables with the exception of frozen asparagus. For frozen asparagus, RTI also proposes using the average of all other frozen vegetables in the absence of plausible values from other sources. Most of the estimates for frozen vegetables are similar to current estimates with the exception of a few that increased more than others (e.g., frozen carrots, frozen cauliflower, and frozen spinach). In addition, the loss estimate for frozen potatoes decreased substantially across periods, so RTI used the estimate for fresh potatoes, which should be a high estimate.

Finally, for dehydrated or dry vegetables, only the estimate for dehydrated potatoes is plausible. Given the similarities in the products, RTI proposes using the same estimate for dehydrated onions and potato chips and shoestring potatoes. This estimate is somewhat lower than the current estimate but reasonable given the low perishability of these foods. RTI was unable to calculate a reasonable estimate for dry edible beans or dry edible peas and lentils given the current data.

Grain Products

Table 8 provides the current ERS estimate and the RTI's proposed estimate of consumer-level food loss conversion factors for grain products, which are primarily used as ingredients. Details of the calculations and an explanation of the proposed estimates are provided in appendix table B-6.

Table 8
Consumer loss estimates for grain products

Category	Food	Previous consumer loss estimate	Proposed consumer loss estimate
		Percent	
Grains	White and whole wheat flour	20	NA
	Durum flour	20	NA
	Rice	20	33
	Rye flour	20	NA
	Corn flour and meal	20	NA
	Corn hominy and grits	20	NA
	Corn starch	20	NA
	Barley products[a]	20	14
	Oat products	20	14

NA = not available; TBD = to be decided; reasonable estimate might be calculable if ingredient percentage is revised.
[a] Food has 10 or fewer consumption observations in NHANES (National Health and Nutrition Examination Survey); thus, the total consumption estimate may not be reliable.

Source: RTI International.

RTI was unable to calculate an estimate for most foods in this group because they are used almost exclusively as ingredients (e.g., various types of flours). The exceptions are rice, barley products, and oat products. For rice, the estimate based on the LAFA data is 33 percent, which is substantially higher than the current estimate of 20 percent but is plausible given that a large amount of plate waste likely occurs for rice. The LAFA-based estimate for barley products is 14 percent, which is somewhat lower than the current estimate of 20 percent. Based on the similarity of products, RTI proposes applying this barley estimate for oat products.

Added Sugars and Sweeteners

Table 9 provides the current ERS estimate and the proposed estimate of consumer-level food loss conversion factors for added sugars and sweeteners. Details of the calculations and an explanation of the proposed estimates are provided in appendix table B-7.

RTI derived estimates for cane and beet sugar and for honey using the LAFA data. While the estimate for cane and beet sugar increased substantially from the current estimate, the estimate for honey decreased somewhat. Consumption of high-fructose corn syrup (HFCS), glucose, and dextrose is not reflected in the consumption data because these items are used only as ingredients; RTI proposes using the estimate calculated for honey. For the final category of edible syrups, the estimate unadjusted for ingredient use is a somewhat plausible 8 percent. But because the expert panel members believe the items in this category are frequently used as an ingredient, a plausible estimate is not feasible; thus, RTI proposes using the estimate for honey for this category also.

Table 9
Consumer loss estimates for added sugars and sweeteners

Category	Food	Previous consumer loss estimate	Proposed consumer loss estimate
		Percent	
Added sugars and sweeteners	Cane and beet sugar	20	34
	High-fructose corn syrup	20	15
	Glucose	20	15
	Dextrose	20	15
	Honey	20	15
	Edible syrups	20	15

Source: RTI International.

Analysis Using RTI's Proposed Estimates in the ERS Loss-Adjusted Food Availability Data

For each commodity, ERS used the consumer-level loss estimate proposed by RTI in the Loss-Adjusted Food Availability data to determine the effects on ERS's per capita estimates of the pounds of food available annually for consumption and the number of calories available per day for consumption. Only those foods for which ERS had an estimate proposed by RTI are included in the calculations.

Meat, Poultry, Fish, Eggs, and Nuts

Table 10 presents a comparison of ERS and RTI loss estimates for each commodity in the meat, poultry, fish, eggs, and nuts group from the edible share of loss at the consumer level, per capita. If RTI's proposed estimates are adopted in the data series, this food group would have the largest change of all food groups: an increase in availability of 22.25 pounds per year (15 percent). This is equivalent to a 76-calorie increase per capita per day, which is almost a 17-percent increase from the baseline.

The largest change for an individual food commodity in this group is for chicken. The current ERS estimate for consumer loss is 40 percent, whereas RTI's proposed estimate is much lower at 15 percent. This lower loss estimate results in an increase of 14.63 pounds of chicken available for consumption per year and an increase of 42.3 calories per day (a 41.7-percent increase for both). Adoption of the proposed loss estimates in the data series would mean that for the first time since the data series began in 1909, consumers would now eat more chicken than beef in terms of pounds per year.

The largest decrease in terms of availability in this food group is for eggs, with a 2.4-pound-per-year decrease. However, over the course of a year, this has little effect in terms of calories (4.3 fewer calories per day). The largest decrease in terms of percent is for canned sardines (a 28.9-percent decrease in daily calories), but sardines are not a major component of the total food available for consumption so the impact on total calories from all foods is negligible. The impact on tree nut consumption is minimal, though peanuts changed the most with a 6.7-percent increase per year.

Dairy Products

For reasons described previously, RTI was unable to provide proposed consumer loss estimates for the plain beverage milks, skim milk, and half and half. For the dairy product group as a whole, adopting RTI's proposed estimates in the data series results in 8.96 fewer pounds per capita per year (-4.8 percent), or 23.6 fewer calories per day (-9.1 percent) (table 11).[7]

There would be no notable increases in terms of pounds per year or calories per day for any dairy product from adopting RTI's proposed estimates for consumer loss of the edible share of food. Percentage-wise, a dozen commodities show more than a 20-percent decrease, but only one would result in major changes in pounds per year or calories per day because the

[7]Note that all fluid dairy products were converted to pounds.

Table 10

Comparison of ERS and RTI estimates of meat, poultry, fish, eggs, and nuts loss at the consumer level (per capita)[1]

Commodity	Consumer loss estimates		Difference between ERS and RTI estimates	Quantity of food consumed after adjusting for all losses		Difference in quantity consumed between ERS and RTI estimates		Calories		Difference in calories between ERS and RTI estimates	
	ERS estimate	RTI estimate		ERS estimate	RTI estimate			ERS estimate	RTI estimate		
	Percent			*Pounds/year*		*Pounds/ year*	*Percent*	*Number/day*		*Number/ day*	*Percent*
Beef	32.0	20.0	-60.0	40.86	48.07	7.21	17.6	154.0	181.2	27.2	17.6
Veal	35.0	20.0	-75.0	0.17	0.21	0.04	23.1	0.5	0.6	0.1	23.1
Pork	39.0	29.0	-34.5	26.85	31.25	4.40	16.4	90.6	105.5	14.9	16.4
Lamb	36.0	20.0	-80.0	0.44	0.55	0.11	25.0	1.7	2.1	0.4	25.0
Chicken	40.0	15.0	-166.7	35.10	49.73	14.63	41.7	101.6	143.9	42.3	41.7
Turkey	32.0	35.0	8.6	8.75	8.37	-0.39	-4.4	22.3	21.3	-1.0	-4.4
Fresh and frozen fish	33.0	40.0	17.5	3.97	3.55	-0.41	-10.4	7.1	6.4	-0.7	-10.4
Fresh and frozen shellfish	33.0	40.0	17.5	3.54	3.17	-0.37	-10.4	3.9	3.5	-0.4	-10.4
Canned salmon	10.0	17.0	41.2	0.16	0.15	-0.01	-7.8	0.3	0.3	-0.0	-7.8
Canned sardines	10.0	36.0	72.2	0.16	0.12	-0.05	-28.9	0.4	0.3	-0.1	-28.9
Canned tuna	10.0	17.0	41.2	2.43	2.24	-0.19	-7.8	3.5	3.2	-0.3	-7.8
Canned shellfish	10.0	17.0	41.2	0.34	0.31	-0.03	-7.8	0.5	0.4	-0.0	-7.8
Other canned fish	10.0	17.0	41.2	0.20	0.19	-0.02	-7.8	0.3	0.3	-0.0	-7.8
Cured fish	10.0	17.0	41.2	0.27	0.25	-0.02	-7.8	0.4	0.4	-0.0	-7.8
Total meat	--	--	--	123.25	148.16	24.91	20.2	387.0	469.3	82.3	21.3
Eggs	15.0	23.0	34.8	21.99	19.58	-2.41	-11.0	39.3	35.0	-4.3	-11.0
Peanuts	10.0	4.0	-150.0	5.51	5.87	0.37	6.7	38.6	41.2	2.6	6.7
Almonds	10.0	21.0	52.4	0.86	0.75	-0.10	-12.2	6.2	5.4	-0.8	-12.2
Hazelnuts	10.0	20.0	50.0	0.06	0.06	-0.01	-11.1	0.5	0.4	-0.1	-11.1
Pecans	10.0	14.0	28.6	0.38	0.36	-0.02	-4.4	3.2	3.1	-0.1	-4.4
Walnuts	10.0	18.0	44.4	0.45	0.41	-0.04	-8.9	3.7	3.3	-0.3	-8.9
Macadamia nuts	10.0	8.0	-25.0	0.11	0.11	0.00	2.2	1.0	1.0	0.0	2.2
Pistachio nuts	10.0	16.0	37.5	0.11	0.10	-0.01	-6.7	0.8	0.7	-0.1	-6.7
Other tree nuts	10.0	18.0	44.4	0.81	0.74	-0.07	-8.9	6.4	5.8	-0.6	-8.9
Total tree nuts	--	--	--	2.78	2.53	-0.25	-8.8	21.7	19.8	-1.9	-8.6
Coconut	10.0	10.0	0.0	0.48	0.48	0.00	0.0	3.9	3.9	0.0	0.0
Total meat group	**--**	**--**	**--**	**148.49**	**170.74**	**22.25**	**15.0**	**452.0**	**528.0**	**76.1**	**16.8**

[1]RTI estimate is the RTI "best estimate."

Source: USDA, Economic Research Service using RTI "best estimate" data and ERS Loss-Adjusted Food Availability data for 2006.

Table 11

Comparison of ERS and RTI estimates of dairy products loss at the consumer level (per capita)[1]

Commodity	Consumer loss estimates		Difference between ERS and RTI estimates	Quantity of food consumed after adjusting for all losses		Difference in quantity consumed between ERS and RTI estimates		Calories		Difference in calories between ERS and RTI estimates	
	ERS estimate	RTI estimate		ERS estimate	RTI estimate			ERS estimate	RTI estimate		
	Percent			*Pounds/year*		*Pounds/ year*	*Percent*	*Number/day*		*Number/ day*	*Percent*
Plain whole milk	20.0	NA	NA	39.16	NA	NA	NA	29.1	NA	NA	NA
Plain 2 percent milk	20.0	NA	NA	41.92	NA	NA	NA	26.0	NA	NA	NA
Plain 1 percent milk	20.0	NA	NA	15.35	NA	NA	NA	8.0	NA	NA	NA
Skim milk	20.0	NA	NA	19.17	NA	NA	NA	8.1	NA	NA	NA
Whole flavored milk	20.0	45.0	55.6	1.70	1.17	-0.53	-31.3	1.8	1.2	-0.5	-31.3
Low-fat flavored milk	20.0	45.0	55.6	8.81	6.06	-2.75	-31.3	6.9	4.8	-2.2	-31.3
Buttermilk	20.0	18.0	-11.1	1.18	0.81	-0.37	-31.3	0.6	0.4	-0.2	-31.3
Refrigerated yogurt	20.0	21.0	4.8	7.79	7.69	-0.10	-1.3	5.9	5.8	-0.1	-1.3
Cheddar cheese	13.0	11.0	-18.2	8.48	8.67	0.19	2.3	42.4	43.4	1.0	2.3
Other American cheese	13.0	28.0	53.6	2.21	1.83	-0.38	-17.2	10.9	9.0	-1.9	-17.2
Provolone cheese	13.0	14.0	7.1	0.88	0.87	-0.01	-1.1	3.8	3.8	0.0	-1.1
Romano cheese	13.0	8.0	-62.5	0.20	0.21	0.01	5.7	1.0	1.0	0.1	5.7
Parmesan cheese	13.0	8.0	-62.5	0.53	0.56	0.03	5.7	2.6	2.7	0.1	5.7
Mozzarella cheese	13.0	31.0	58.1	8.61	6.83	-1.78	-20.7	32.2	25.6	-6.7	-20.7
Ricotta cheese	13.0	12.0	-8.3	0.67	0.68	0.01	1.1	1.3	1.3	0.0	1.1
Other Italian cheese	13.0	16.0	18.8	0.35	0.34	-0.01	-3.4	1.7	1.6	-0.1	-3.4
Swiss cheese	13.0	50.0	74.0	1.04	0.60	-0.44	-42.5	4.9	2.8	-2.1	-42.5
Brick cheese	13.0	40.0	67.5	0.02	0.02	-0.01	-31.0	0.11	0.1	0.0	-31.0
Muenster cheese	13.0	35.0	62.9	0.26	0.20	-0.07	-25.3	1.2	0.9	-0.3	-25.3
Blue cheese	13.0	43.0	69.8	0.16	0.11	-0.06	-34.5	0.7	0.5	-0.2	-34.5
Other miscellaneous cheese	13.0	42.0	69.0	1.15	0.77	-0.38	-33.3	5.3	3.5	-1.8	-33.3
Regular cottage cheese	20.0	31.0	35.5	0.87	0.75	-0.12	-13.8	1.0	0.8	-0.1	-13.8
Low-fat cottage cheese	20.0	4.0	-400.0	0.96	1.16	0.19	20.0	0.9	1.0	0.2	20.0
Regular ice cream	20.0	24.0	16.7	10.35	9.83	-0.52	-5.0	25.8	24.5	-1.3	-5.0
Low-fat ice cream	20.0	24.0	16.7	4.88	4.64	-0.24	-5.0	10.6	10.0	-0.5	-5.0
Frozen yogurt and other frozen miscellaneous product	20.0	33.0	39.4	3.07	2.57	-0.50	-16.3	6.2	5.2	-1.0	-16.3
Evaporated and condensed canned whole milk	20.0	15.0	-33.3	1.09	1.16	0.07	6.3	1.8	1.9	0.1	6.3
Evaporated and condensed bulk whole milk	20.0	15.0	-33.3	0.44	0.46	0.03	6.3	0.7	0.8	0.0	6.3
Evaporated and condensed bulk and canned skim milk	20.0	15.0	-33.3	2.98	3.16	0.19	6.3	2.9	3.1	0.2	6.3

Continued—

Table 11

Comparison of ERS and RTI estimates of dairy products loss at the consumer level (per capita)[1]—continued

Commodity	Consumer loss estimates		Difference between ERS and RTI estimates	Quantity of food consumed after adjusting for all losses		Difference in quantity consumed between ERS and RTI estimates		Calories		Difference in calories between ERS and RTI estimates	
	ERS estimate	RTI estimate		ERS estimate	RTI estimate			ERS estimate	RTI estimate		
	Percent			*Pounds/year*		*Pounds/ year*	*Percent*	*Number/day*		*Number/ day*	*Percent*
Dry whole milk	1.0	41.0	97.6	0.03	0.02	-0.01	-40.4	0.16	0.1	-0.1	-40.4
Nonfat dry milk	1.0	41.0	97.6	3.12	1.86	-1.26	-40.4	14.1	8.4	-5.7	-40.4
Dry buttermilk	1.0	41.0	97.6	0.24	0.14	-0.10	-40.4	1.2	0.7	-0.5	-40.4
Half and half[2]	20.0	12.0	-66.7	NA	NA	NA	NA	NA	NA	NA	NA
Eggnog	20.0	51.0	60.8	0.10	0.06	-0.04	-38.8	0.1	0.0	0.0	-38.8
Total dairy	**--**	**--**	**--**	**187.75**	**178.80**	**-8.96**	**-4.8**	**259.8**	**236.2**	**-23.6**	**-9.1**

NA = RTI "best estimate" was not available and therefore by default, the ERS estimate was used.
[1]RTI estimate is the RTI "best estimate."
[2]Loss-Adjusted Food Availability data for half and half was not available for 2006.

Source: USDA, Economic Research Service using RTI "best estimate" data and ERS Loss-Adjusted Food Availability data for 2006.

baseline amounts are low. The exception is low-fat flavored milk, which decreases by 2.75 pounds per capita per year. However, this translates to only 2.2 fewer calories per capita per day. The impact on total dairy is the cumulative impact from a large number of individual foods with small changes.

Added Fats and Oils (Excluding Dairy)

Table 12 compares the ERS and RTI loss estimates of the edible share of annual added fats and oils at the consumer level, per capita. Adopting the RTI estimates for added fats and oils as a group decreases the annual amount available for consumption by 4.28 pounds per capita (a 6.3-percent decrease). This translates into 51.7 fewer calories per day (an 8.1-percent decrease). This change is important as Americans have historically consumed too much fat, on average, relative to Federal dietary guidelines. If the RTI estimates are used for added fats and oils, the average American would consume 62 grams of added fats and oils on a daily basis.[8] This is still high, particularly when considering that the amount does not include naturally occurring fats in food.

Although many individual added fats and oils had more than a 20-percent decrease in annual pounds per capita per year, only shortening had a notable decrease in pounds per year. Per capita shortening availability decreased almost 4 pounds per year, or 43.9 calories per capita per day. Shortening was responsible for most of the change in the added fats and oils group.

Fruits

Table 13 presents a comparison of ERS consumer-level loss estimates and RTI's proposed estimates, per capita, for each fresh and processed type of fruit in the LAFA data. Adopting RTI's proposed estimates would decrease the annual amount of fruit consumed by the average American by 9.75

[8]To put this into context, 62 grams of added fats and oils would account for 28 percent of the total proposed calories for a 2,000-calorie-per-day diet. The 2005 *Dietary Guidelines for Americans* recommend that fats and oils, both naturally occurring and added, contribute 20-35 percent of total calories for adults; 25-35 percent for children ages 4-18; and 30-35 percent for children ages 2-3.

Table 12

Comparison of ERS and RTI estimates of added fats and oils loss at the consumer level (per capita)[1]

Commodity	Consumer loss estimates		Difference between ERS and RTI estimates	Quantity of food consumed after adjusting for all losses		Difference in quantity consumed between ERS and RTI estimates		Calories		Difference in calories between ERS and RTI estimates	
	ERS estimate	RTI estimate		ERS estimate	RTI estimate			ERS estimate	RTI estimate		
	Percent			*Pounds/year*		*Pounds/ year*	*Percent*	*Number/day*		*Number/ day*	*Percent*
Added fats and oils											
Butter	15.0	35.0	57.1	3.73	2.85	-0.88	-23.5	33.4	25.5	-7.9	-23.5
Margarine	15.0	35.0	57.1	3.62	2.77	-0.85	-23.5	24.3	18.6	-5.7	-23.5
Lard	0.0	35.0	100.0	0.84	0.54	-0.29	-35.0	9.3	6.1	-3.3	-35.0
Edible beef tallow	0.0	35.0	100.0	1.94	1.26	-0.68	-35.0	21.7	14.1	-7.6	-35.0
Shortening	15.0	35.0	57.1	16.69	12.76	-3.93	-23.5	186.7	142.8	-43.9	-23.5
Salad and cooking oils	20.0	15.0	-33.3	28.18	29.94	1.76	6.3	315.2	334.9	19.7	6.2
Other edible fats and oils	0.0	25.0	100.0	2.04	1.53	-0.51	-25.0	22.8	17.1	-5.7	-25.0
Total added fats and oils	--	--	--	57.04	51.66	-5.38	-9.4	613.4	559.0	-54.4	-8.9
Dairy share of fats											
Cream (light, heavy, and half & half)	20.0	12.0	-66.7	5.80	6.38	0.58	10.00	12.5	13.8	1.3	10.0
Eggnog	20.0	51.0	60.8	0.21	0.13	-0.08	-38.8	0.2	0.1	-0.1	-38.8
Sour cream	20.0	8.0	-150.0	2.96	3.41	0.44	15.0	6.2	7.1	0.9	15.0
Cream cheese	20.0	13.0	-53.8	1.78	1.94	0.16	8.8	6.2	6.8	0.5	8.7
Total dairy fats	--	--	--	10.76	11.86	1.10	10.2	25.1	27.8	2.7	10.6
Total added and dairy fats	**--**	**--**	**--**	**67.79**	**63.52**	**-4.28**	**-6.3**	**638.6**	**586.9**	**-51.7**	**-8.1**

[1]RTI estimate is the RTI "best estimate."

Source: USDA, Economic Research Service using RTI "best estimate" data and ERS Loss-Adjusted Food Availability data for 2006.

pounds (roughly a 7-percent decrease). This translates into only 7 fewer calories per day. Americans are already under-consuming fruits, on average (Wells and Buzby, 2008), so adopting RTI's proposed estimates means that the shortfall from the dietary recommendations for fruit would be even greater.

Although many of the loss estimates for canned, frozen, and dried fruit increased significantly, their impact on per capita consumption estimates for individual fruits were small because these fruits were not among the most popularly consumed. Most of the change in the loss estimate for total fruits was due to the changes in fresh fruit.

In terms of pounds per year, the largest changes were for fresh oranges, which decreased by 1.4 pounds, and fresh cantaloupe, which decreased by 1.7 pounds.

Table 13

Comparison of ERS and RTI estimates of fruit loss at the consumer level (per capita)[1]

Commodity	Consumer loss estimates		Difference between ERS and RTI estimates	Quantity of food consumed after adjusting for all losses		Difference in quantity consumed between ERS and RTI estimates		Calories		Difference in calories between ERS and RTI estimates	
	ERS estimate	RTI estimate		ERS estimate	RTI estimate			ERS estimate	RTI estimate		
	Percent			*Pounds/year*		*Pounds/ year*	*Percent*	*Number/day*		*Number/ day*	*Percent*
Fresh oranges	20.0	36.0	44.4	4.66	3.26	-1.41	-30.19	2.71	1.89	-0.8	-30.2
Fresh tangerines	20.0	52.0	61.5	1.10	0.45	-0.65	-59.26	0.72	0.29	-0.4	-59.3
Fresh grapefruit[2]	20.0	NA	NA	0.59	NA	NA	NA	0.23	NA	NA	NA
Fresh lemons	20.0	44.0	54.5	1.22	0.33	-0.89	-72.73	0.44	0.12	-0.3	-72.7
Fresh limes	20.0	44.0	54.5	1.26	0.79	-0.47	-37.50	0.47	0.29	-0.2	-37.5
Fresh apples	20.0	NA	NA	10.90	NA	NA	NA	7.07	NA	NA	NA
Fresh apricots	20.0	10.0	-100.0	0.04	0.04	0.00	13.70	0.20	0.22	0.0	13.7
Fresh avocados	20.0	32.0	37.5	1.65	1.29	-0.37	-22.22	3.29	2.56	-0.7	-22.2
Fresh bananas	20.0	NA	NA	10.17	NA	NA	NA	11.27	NA	NA	NA
Fresh blueberries	20.0	8.0	-150.0	0.37	0.43	0.06	16.00	0.26	0.30	0.0	16.0
Fresh cantaloupe	20.0	43.0	53.5	2.32	0.60	-1.72	-74.19	0.98	0.25	-0.7	-74.2
Fresh cherries	20.0	51.0	60.8	0.67	0.38	-0.29	-43.66	0.46	0.26	-0.2	-43.7
Fresh cranberries	20.0	26.0	23.1	0.06	0.06	0.00	-7.69	0.04	0.03	0.0	-7.7
Fresh grapes	20.0	33.0	39.4	4.86	4.03	-0.83	-17.11	4.16	3.45	-0.7	-17.1
Fresh honeydew	20.0	43.0	53.5	0.35	0.04	-0.31	-88.46	0.16	0.02	-0.1	-88.5
Fresh kiwifruit	20.0	45.0	55.6	0.25	0.15	-0.09	-37.88	0.19	0.12	-0.1	-37.9
Fresh mangoes	20.0	13.0	-53.8	0.84	0.96	0.12	14.29	0.67	0.77	0.1	14.3
Fresh papaya	20.0	20.0	0.0	0.21	0.21	0.00	0.00	0.10	0.10	0.0	0.0
Fresh peaches	35.0	42.0	16.7	2.23	1.96	-0.27	-12.07	1.14	1.01	-0.1	-12.1
Fresh pears	20.0	NA	NA	1.75	NA	NA	NA	1.26	NA	NA	NA
Fresh pineapple	20.0	37.0	45.9	1.31	0.59	-0.72	-54.84	0.81	0.37	-0.4	-54.8
Fresh plums	20.0	27.0	25.9	0.59	0.54	-0.06	-9.46	0.34	0.31	0.0	-9.5
Fresh raspberries	20.0	NA	NA	0.24	NA	NA	NA	0.15	NA	NA	NA
Fresh strawberries	20.0	35.0	42.9	3.77	3.01	-0.77	-20.27	1.55	1.23	-0.3	-20.3
Fresh watermelon	20.0	13.0	-53.8	3.63	4.42	0.79	21.88	1.35	1.65	0.3	21.9
Total fruit—fresh	--	--	--	55.02	47.15	-7.87	-14.30	40.01	35.22	-4.8	-12.0
Canned apples and applesauce	10.0	8.0	-25.0	2.85	2.91	0.06	2.22	1.48	1.51	0.0	2.2
Canned apricots	10.0	27.0	63.0	0.12	0.10	-0.02	-18.89	0.03	0.03	0.0	-18.9
Canned sweet cherries	10.0	32.0	68.8	0.01	0.01	0.00	-24.44	0.01	0.01	0.0	-24.4
Canned tart cherries	10.0	32.0	68.8	0.10	0.08	-0.02	-24.44	0.05	0.04	0.0	-24.4
Canned peaches	10.0	9.0	-11.1	2.94	2.97	0.03	1.11	0.88	0.89	0.0	1.1
Canned pears	10.0	9.0	-11.1	2.03	2.05	0.02	1.11	0.73	0.74	0.0	1.1
Canned pineapple	10.0	9.0	-11.1	2.37	2.40	0.03	1.11	0.95	0.96	0.0	1.1
Canned plums	10.0	26.0	61.5	0.03	0.03	-0.01	-17.78	0.02	0.01	0.0	-17.8
Canned olives	10.0	25.0	60.0	0.66	0.55	-0.11	-16.67	0.97	0.80	-0.2	-16.7

Continued—

Table 13

Comparison of ERS and RTI estimates of fruit loss at the consumer level (per capita)[1]—continued

Commodity	Consumer loss estimates		Difference between ERS and RTI estimates	Quantity of food consumed after adjusting for all losses		Difference in quantity consumed between ERS and RTI estimates		Calories		Difference in calories between ERS and RTI estimates	
	ERS estimate	RTI estimate		ERS estimate	RTI estimate			ERS estimate	RTI estimate		
	Percent			*Pounds/year*		*Pounds/ year*	*Percent*	*Number/day*		*Number/ day*	*Percent*
Total fruit—canned	--	--	--	11.11	11.09	-0.02	-0.20	5.11	4.99	-0.1	-2.4
Frozen blackberries	10.0	40.0	75.0	0.06	0.04	-0.02	-33.33	0.05	0.03	0.0	-33.3
Frozen blueberries	10.0	29.0	65.5	1.54	1.21	-0.32	-21.11	0.97	0.77	-0.2	-21.1
Frozen raspberries	10.0	24.0	58.3	0.29	0.25	-0.05	-15.56	0.23	0.20	0.0	-15.6
Frozen strawberries	10.0	24.0	58.3	0.39	0.33	-0.06	-15.56	0.17	0.14	0.0	-15.6
Other frozen berries	10.0	30.0	66.7	0.05	0.04	-0.01	-22.22	0.03	0.03	0.0	-22.2
Frozen apples	10.0	35.0	71.4	0.02	0.01	0.00	-27.78	0.01	0.01	0.0	-27.8
Frozen apricots	10.0	35.0	71.4	0.58	0.42	-0.16	-27.78	0.35	0.25	-0.1	-27.8
Frozen sweet cherries	10.0	29.0	65.5	0.18	0.14	-0.04	-21.11	0.10	0.08	0.0	-21.1
Frozen tart cherries	10.0	29.0	65.5	0.39	0.30	-0.08	-21.11	0.22	0.17	0.0	-21.1
Frozen peaches	10.0	35.0	71.4	0.40	0.29	-0.11	-27.78	0.24	0.17	-0.1	-27.8
Frozen plums and prunes	10.0	NA	NA	0.01	NA	NA	NA	0.01	NA	NA	NA
Total fruit—frozen	--	--	--	3.91	3.05	-0.86	-22.01	2.39	1.86	-0.5	-22.1
Dried apples	10.0	11.0	9.1	0.10	0.10	0.00	-1.11	0.31	0.30	0.0	-1.1
Dried apricots	10.0	11.0	9.1	0.11	0.11	0.00	-1.11	0.32	0.32	0.0	-1.1
Dried dates	10.0	25.0	60.0	0.12	0.10	-0.02	-18.75	0.43	0.35	-0.1	-18.8
Dried figs	10.0	25.0	60.0	0.07	0.06	-0.01	-16.67	0.23	0.19	0.0	-16.7
Dried peaches	10.0	11.0	9.1	0.02	0.02	0.00	-1.11	0.06	0.06	0.0	-1.1
Dried pears[3]	10.0	11.0	9.1	NA	NA	NA	NA	NA	NA	NA	NA
Dried plums	10.0	11.0	9.1	0.25	0.25	0.00	-1.11	0.75	0.74	0.0	-1.1
Raisins	10.0	26.0	61.5	1.29	1.06	-0.23	-17.78	6.01	4.94	-1.1	-17.8
Total fruit—dried	--	--	--	1.97	1.70	-0.27	-13.73	8.10	6.90	-1.2	-14.8
Grapefruit juice	10.0	NA	NA	1.49	NA	NA	NA	0.70	NA	NA	NA
Lemon juice	10.0	NA	NA	1.06	NA	NA	NA	0.28	NA	NA	NA
Lime juice	10.0	NA	NA	0.23	NA	NA	NA	0.06	NA	NA	NA
Orange juice	10.0	NA	NA	34.11	NA	NA	NA	19.92	NA	NA	NA
Apple juice	10.0	NA	NA	16.37	NA	NA	NA	9.35	NA	NA	NA
Cranberry juice	10.0	NA	NA	1.83	NA	NA	NA	1.04	NA	NA	NA
Grape juice	10.0	NA	NA	3.31	NA	NA	NA	2.47	NA	NA	NA
Pineapple juice	10.0	NA	NA	1.99	NA	NA	NA	1.30	NA	NA	NA
Prune juice	10.0	32.0	68.8	0.26	0.20	-0.06	-24.44	0.23	0.17	-0.1	-24.4
Total fruit—juice	--	--	--	60.65	60.59	-0.06	-0.10	35.36	35.30	-0.1	-0.2
Total fruit	--	--	--	133.07	123.99	-9.08	-6.83	91.23	84.54	-6.7	-7.3

NA = RTI "best estimate" was not available and therefore by default, the ERS estimate was used.

[1]RTI estimate is the RTI "best estimate."

[2]The RTI "best estimate" for grapefruit at 54 percent was unrealistic given the nonedible share (refuse) at 50 percent. Therefore, the ERS estimate was used.

[3]Loss-Adjusted Food Availability data for dried pears was not available for 2006.

Source: USDA, Economic Research Service using RTI "best estimate" data and ERS Loss-Adjusted Food Availability data for 2006.

Vegetables

Table 14 presents a comparison of ERS and RTI consumer-level loss estimates, per capita, for each fresh and processed type of vegetable in the LAFA data. Overall, adopting all of RTI's best estimates for vegetables results in an almost 11-pound drop in annual vegetable consumption per capita (a 6.2-percent decrease), which translates into roughly 6 fewer calories per day (a 4.6-percent drop). This is important because Americans already under-consume vegetables, according to Federal dietary guidelines (Wells and Buzby, 2008).

As for fruit, the bulk of the change occurs for the estimates for the fresh form. For fresh vegetables, fresh potatoes increase the most (4.85 pounds per year, or 20 percent). This is due to the combined effect of the consumer-level food loss dropping almost by half and the importance of potatoes in total vegetable consumption. Similar reasoning helps explain the almost 2-pounds-per-year increase in fresh tomatoes. Meanwhile, five fresh vegetables had over a 1-pound decrease in annual consumption: fresh bell peppers, carrots, celery, onions, and pumpkin. The change in fresh pumpkins is due to the more than tripling of the consumer-level loss estimate. The change in the other four fresh vegetables is due to the combination of noticeable increases in their loss estimates and their importance to total annual consumption of vegetables.

Grain Products

Because of the previously stated data limitations, RTI was unable to propose consumer-level food loss estimates for six of the nine types of grain products in the LAFA data series. If ERS adopts RTI's three proposed estimates for grains, the availability per capita per year would fall by roughly 2 pounds, or 9.4 calories per day (1.5 percent) (table 15).

If adopted, RTI's proposed estimates for barley and oat products would result in minimal per capita changes in pounds per year or calories per day. Most of the change in this food group is for rice, which decreases by 2.36 pounds per capita per year, or 10.7 calories per day (16.3 percent).

Added Sugars and Sweeteners

Table 16 compares how ERS consumer-level loss estimates and RTI's proposed estimates for annual per capita added sugars and sweeteners translate into total pounds per capita per year and daily calories in the LAFA data. Adopting the RTI estimates for this category decreases the amount available for consumption by 4.36 pounds per capita per year, or 20.7 calories per day (a 4.4-percent decrease for both).

Refined sugar has the largest change in this food group when RTI's proposed loss estimates are adopted: a decrease in per capita availability of almost 7.8 pounds per year, or 36.8 calories per day, a 17.5-percent drop per person. Meanwhile, per capita availability of high-fructose corn syrup (loss-adjusted) increases by 2.6 pounds per year, or 12.3 calories per day.

Table 14

Comparison of ERS and RTI estimates of vegetable loss at the consumer level (per capita)[1]

Commodity	Consumer loss estimates		Difference between ERS and RTI estimates	Quantity of food consumed after adjusting for all losses		Difference in quantity consumed between ERS and RTI estimates		Calories		Difference in calories between ERS and RTI estimates	
	ERS estimate	RTI estimate		ERS estimate	RTI estimate			ERS estimate	RTI estimate		
	Percent			*Pounds/year*		*Pounds/ year*	*Percent*	*Number/day*		*Number/ day*	*Percent*
Fresh artichokes	20.0	18.0	-11.1	0.25	0.28	0.03	10.0	0.15	0.16	0.0	10.0
Fresh asparagus	20.0	18.0	-11.1	0.31	0.33	0.02	6.1	0.08	0.08	0.0	6.1
Fresh bell peppers	20.0	39.0	48.7	4.98	3.45	-1.53	-30.6	1.25	0.86	-0.4	-30.6
Fresh broccoli	20.0	12.0	-66.7	1.91	2.29	0.37	19.5	0.81	0.97	0.2	19.5
Fresh brussels sprouts	20.0	12.0	-66.7	0.15	0.16	0.02	11.4	0.08	0.09	0.0	11.4
Fresh cabbage	20.0	24.0	16.7	3.72	3.47	-0.25	-6.7	1.09	1.02	-0.1	-6.7
Fresh carrots	20.0	34.0	41.2	5.15	4.11	-1.05	-20.3	2.60	2.07	-0.5	-20.3
Fresh cauliflower	20.0	9.0	-122.2	0.26	0.40	0.15	57.9	0.08	0.13	0.0	57.9
Fresh celery	20.0	39.0	48.7	3.67	2.66	-1.01	-27.5	0.63	0.46	-0.2	-27.5
Fresh collard greens	20.0	38.0	47.4	0.13	0.07	-0.06	-48.6	0.05	0.03	0.0	-48.6
Fresh sweet corn	32.0	NA	NA	0.30	NA	NA	NA	0.32	NA	NA	NA
Fresh cucumbers	20.0	32.0	37.5	2.81	2.18	-0.64	-22.6	0.41	0.32	-0.1	-22.6
Fresh eggplant	27.0	26.0	-3.8	0.33	0.33	0.01	1.9	0.10	0.10	0.0	1.9
Fresh escarole and endive	20.0	24.0	16.7	0.08	0.07	0.00	-6.1	0.02	0.01	0.0	-6.1
Fresh garlic	20.0	43.0	53.5	1.35	0.89	-0.47	-34.3	2.51	1.65	-0.9	-34.3
Fresh kale	20.0	38.0	47.4	0.06	0.04	-0.03	-43.9	0.04	0.02	0.0	-43.9
Fresh head lettuce	20.0	24.0	16.7	10.90	10.22	-0.68	-6.2	1.72	1.62	-0.1	-6.3
Fresh romaine and leaf lettuce	20.0	24.0	16.7	5.70	5.31	-0.38	-6.7	1.19	1.11	-0.1	-6.7
Fresh lima beans	20.0	27.0	25.9	0.01	0.00	0.00	-29.2	0.01	0.01	0.0	-29.2
Fresh mushrooms	20.0	21.0	4.8	1.62	1.60	-0.02	-1.3	0.44	0.43	0.0	-1.3
Fresh mustard greens	20.0	38.0	47.4	0.14	0.10	-0.03	-24.7	0.05	0.03	0.0	-24.7
Fresh okra	20.0	NA	NA	0.18	NA	NA	NA	0.07	NA	NA	NA
Fresh onions	35.0	43.0	18.6	9.30	7.95	-1.35	-14.5	4.84	4.14	-0.7	-14.5
Fresh potatoes	30.0	16.0	-87.5	24.23	29.07	4.85	20.0	21.07	25.29	4.2	20.0
Fresh pumpkin	20.0	69.0	71.0	1.95	0.04	-1.91	-98.0	0.63	0.01	-0.6	-98.0
Fresh radishes	20.0	47.0	57.4	0.28	0.17	-0.11	-38.6	0.06	0.04	0.0	-38.6
Fresh snap beans	22.0	24.0	8.3	1.05	1.02	-0.03	-3.0	0.40	0.39	0.0	-3.0
Fresh spinach	20.0	9.0	-122.2	0.77	0.93	0.16	21.2	0.22	0.27	0.0	21.2
Fresh squash	20.0	25.0	20.0	2.29	2.11	-0.18	-7.9	0.45	0.42	0.0	-7.9
Fresh sweet potatoes	31.0	44.0	29.5	1.46	1.00	-0.46	-31.7	2.15	1.47	-0.7	-31.7
Fresh tomatoes	20.0	7.0	-185.7	10.37	12.26	1.90	18.3	2.29	2.71	0.4	18.3
Fresh turnip greens	20.0	38.0	47.4	0.10	0.06	-0.04	-36.0	0.04	0.03	0.0	-36.0
Total vegetables—fresh	--	--	--	95.81	92.58	-3.23	-3.4	45.85	45.93	0.1	0.2
Canned asparagus	10.0	2.0	-400.0	0.12	0.13	0.01	8.9	0.03	0.03	0.0	8.9
Canned snap beans	10.0	24.0	58.3	1.97	1.66	-0.31	-15.6	0.49	0.41	-0.1	-15.6

Continued—

Table 14

Comparison of ERS and RTI estimates of vegetable loss at the consumer level (per capita)[1]—continued

Commodity	Consumer loss estimates		Difference between ERS and RTI estimates	Quantity of food consumed after adjusting for all losses		Difference in quantity consumed between ERS and RTI estimates		Calories		Difference in calories between ERS and RTI estimates	
	ERS estimate	RTI estimate		ERS estimate	RTI estimate			ERS estimate	RTI estimate		
	Percent			*Pounds/year*		*Pounds/ year*	*Percent*	*Number/day*		*Number/ day*	*Percent*
Canned cabbage (sauerkraut)	10.0	16.0	37.5	0.45	0.42	-0.03	-6.7	0.11	0.10	0.0	-6.7
Canned carrots	10.0	31.0	67.7	0.62	0.47	-0.14	-23.3	0.19	0.14	0.0	-23.3
Canned sweet corn	10.0	7.0	-42.9	5.16	5.33	0.17	3.3	5.20	5.38	0.2	3.3
Canned cucumbers (pickles)	10.0	3.0	-233.3	1.01	1.09	0.08	7.8	1.47	1.59	0.1	7.8
Canned green peas	10.0	24.0	58.3	0.62	0.53	-0.10	-15.6	0.53	0.45	-0.1	-15.6
Canned mushrooms	10.0	9.0	-11.1	0.81	0.82	0.01	1.1	0.25	0.25	0.0	1.1
Canned chile peppers	10.0	4.0	-150.0	3.93	4.19	0.26	6.7	1.04	1.11	0.1	6.7
Canned potatoes	10.0	28.0	64.3	0.47	0.37	-0.09	-20.0	0.35	0.28	-0.1	-20.0
Canned tomatoes	10.0	28.0	64.3	22.41	17.93	-4.48	-20.0	5.34	4.27	-1.1	-20.0
Other canned vegetables	10.0	16.0	37.5	1.66	1.55	-0.11	-6.7	0.55	0.51	0.0	-6.7
Total vegetables—canned	--	--	--	39.23	34.50	-4.73	-12.1	15.55	14.52	-1.0	-6.6
Frozen asparagus	30.0	26.0	-15.4	0.02	0.02	0.00	5.7	0.00	0.00	0.0	5.7
Frozen snap beans	20.0	24.0	16.7	1.15	1.09	-0.06	-5.0	0.40	0.38	0.0	-5.0
Frozen broccoli	16.0	12.0	-33.3	1.61	1.68	0.08	4.8	0.56	0.59	0.0	4.8
Frozen carrots	12.0	34.0	64.7	0.90	0.68	-0.23	-25.0	0.41	0.31	-0.1	-25.0
Frozen cauliflower	17.0	27.0	37.0	0.20	0.18	-0.02	-12.0	0.05	0.04	0.0	-12.0
Frozen sweet corn	14.0	36.0	61.1	2.07	1.54	-0.53	-25.6	2.08	1.55	-0.5	-25.6
Frozen green peas	17.0	24.0	29.2	1.16	1.06	-0.10	-8.4	1.13	1.03	-0.1	-8.4
Frozen lima beans	32.0	27.0	-18.5	0.18	0.19	0.01	7.4	0.23	0.25	0.0	7.4
Frozen potatoes	23.0	16.0	-43.8	17.41	21.51	4.10	23.5	16.88	20.86	4.0	23.5
Frozen spinach	32.0	34.0	5.9	0.34	0.29	-0.05	-14.3	0.13	0.11	0.0	-14.3
Miscellaneous frozen vegetables	23.0	26.0	11.5	1.52	1.46	-0.06	-3.9	0.73	0.71	0.0	-3.9
Total vegetables—frozen	--	--	--	26.55	29.70	3.15	11.9	22.62	25.83	3.2	14.2
Dehydrated onions	10.0	4.0	-150.0	0.16	0.17	0.01	6.7	0.71	0.76	0.0	6.7
Dehydrated potatoes	10.0	4.0	-150.0	1.47	1.57	0.10	6.7	6.49	6.92	0.4	6.7
Potato chips and shoestring potatoes	10.0	4.0	-150.0	3.97	4.23	0.26	6.7	27.47	29.30	1.8	6.7
Total vegetables–dehydrated	--	--	--	5.60	5.98	0.37	6.7	34.67	36.98	2.3	6.7
Dry edible beans	10.0	NA	NA	5.35	NA	NA	NA	9.06	NA	NA	NA
Dry peas and lentils	10.0	NA	NA	1.03	NA	NA	NA	1.50	NA	NA	NA
Total vegetables	--	--	--	173.57	162.75	-10.82	-6.2	129.26	123.27	-5.99	-4.6

NA = RTI "best estimate" was not available and therefore by default, the ERS estimate was used.

[1]RTI estimate is the RTI "best estimate."

Source: USDA, Economic Research Service using RTI "best estimate" data and ERS Loss-Adjusted Food Availability data for 2006.

Table 15

Comparison of ERS and RTI estimates of grain products loss at the consumer level (per capita)[1]

Commodity	Consumer loss estimates		Difference between ERS and RTI estimates	Quantity of food consumed after adjusting for all losses		Difference in quantity consumed between ERS and RTI estimates		Calories		Difference in calories between ERS and RTI estimates	
	ERS estimate	RTI estimate		ERS estimate	RTI estimate			ERS estimate	RTI estimate		
	Percent			*Pounds/year*		*Pounds/ year*	*Percent*	*Number/day*		*Number/ day*	*Percent*
White and whole wheat flour	20.0	NA	NA	86.90	NA	NA	NA	393.9	NA	NA	NA
Durum flour	20.0	NA	NA	8.59	NA	NA	NA	12.2	NA	NA	NA
Rice	20.0	33.0	39.4	14.54	12.18	-2.36	-16.3	65.7	55.0	-10.7	-16.3
Rye flour	20.0	NA	NA	0.35	NA	NA	NA	1.5	1.5	NA	NA
Corn flour and meal	20.0	NA	NA	13.38	NA	NA	NA	60.6	60.6	NA	NA
Corn hominy and grits	20.0	NA	NA	5.98	NA	NA	NA	27.5	27.5	NA	NA
Corn starch	20.0	NA	NA	3.10	NA	NA	NA	15.4	15.4	NA	NA
Barley products	20.0	14.0	-42.9	0.35	0.39	0.04	10.0	1.5	1.7	0.2	10.0
Oat products	20.0	14.0	-42.9	2.45	2.69	0.24	10.0	11.3	12.4	1.1	10.0
Total grain products	**--**	**--**	**--**	**135.64**	**133.56**	**-2.08**	**-1.5**	**617.0**	**607.6**	**-9.4**	**-1.5**

NA = RTI "best estimate" was not available and therefore by default, the ERS estimate was used.
[1]RTI estimate is the RTI "best estimate."

Source: USDA, Economic Research Service using RTI "best estimate" data and ERS Loss-Adjusted Food Availability data for 2006.

Table 16

Comparison of ERS and RTI estimates of added sugars and sweeteners loss at the consumer level (per capita)[1]

Commodity	Consumer loss estimates		Difference between ERS and RTI estimates	Quantity of food consumed after adjusting for all losses		Difference in quantity consumed between ERS and RTI estimates		Calories		Difference in calories between ERS and RTI estimates	
	ERS estimate	RTI estimate		ERS estimate	RTI estimate			ERS estimate	RTI estimate		
	Percent			*Pounds/year*		*Pounds/ year*	*Percent*	*Number/day*		*Number/ day*	*Percent*
Refined sugar	20.0	34.0	41.2	44.43	36.66	-7.78	-17.5	210.4	173.5	-36.8	-17.5
High-fructose corn syrup (HFCS)	20.0	15.0	-33.3	41.48	44.07	2.59	6.2	196.4	208.6	12.3	6.2
Glucose	20.0	15.0	-33.3	9.79	10.40	0.61	6.3	46.3	49.2	2.9	6.3
Dextrose	20.0	15.0	-33.3	2.21	2.35	0.14	6.3	10.5	11.1	0.7	6.3
Honey	20.0	15.0	-33.3	0.80	0.84	0.05	6.2	3.8	4.0	0.2	6.3
Edible syrups	20.0	15.0	-33.3	0.31	0.33	0.02	6.3	1.5	1.6	0.1	6.3
Total added sugars and sweeteners	**--**	**--**	**--**	**99.01**	**94.65**	**-4.36**	**-4.4**	**468.8**	**448.1**	**-20.7**	**-4.4**

NA = RTI "best estimate" was not available and therefore by default, the ERS estimate was used.
[1]RTI estimate is the RTI "best estimate."

Source: USDA, Economic Research Service using RTI "best estimate" data and ERS Loss-Adjusted Food Availability data for 2006.

Total Annual Pounds and Total Daily Calories

Table 17 presents a summary of the phase 2 findings for all food groups. In essence, if all of RTI's proposed estimates are incorporated in the LAFA data, the total impact on per capita availability of all foods available drops by 1.8 percent per year (17.3 pounds). This translates into 41.9 fewer calories per day for the average American.

Table 17

Summary of inclusion of RTI best estimates into the ERS Loss-Adjusted Food Availability data series (per capita)[1]

Commodity	Quantity of food consumed after adjusting for all losses		Difference in quantity consumed between ERS and RTI estimates		Calories		Difference in calories between ERS and RTI estimates	
	ERS estimate	RTI estimate			ERS estimate	RTI estimate		
	Pounds/year		*Pounds/ year*	*Percent*	*Number/day*		*Number/ day*	*Percent*
Added fats and oils	67.8	63.5	-4.3	-6.3	638.6	586.9	-51.7	-8.1
Added sugars and sweeteners	99.0	94.6	-4.4	-4.4	468.8	448.1	-20.7	-4.4
Dairy	187.8	178.8	-9.0	-4.8	259.8	236.2	-23.6	-9.1
Fruit	133.1	124.0	-9.1	-6.8	91.2	84.5	-6.7	-7.3
Grain products	135.6	133.6	-2.1	-1.5	617.0	607.6	-9.4	-1.5
Meat, poultry, fish, eggs, and nuts	148.5	170.7	22.3	15.0	452.0	528.0	76.1	16.8
Vegetables	173.6	162.7	-10.8	-6.2	129.3	123.3	-6.0	-4.6
Total	**945.3**	**928.0**	**-17.3**	**-1.8**	**2,656.5**	**2,614.6**	**-41.9**	**-1.6**

[1]RTI estimate is the RTI "best estimate."

Source: USDA, Economic Research Service using RTI "best estimate" data and ERS Loss-Adjusted Food Availability data for 2006.

Discussion

If ERS adopts all of RTI's proposed estimates of consumer-level food loss (i.e., of the edible share) in the LAFA data, per capita estimates for some individual foods or food groups would change substantially relative to current estimates. Still, the estimated total amount of food consumed annually would change by less than 2 percent.

The proposed estimates of consumer-level food loss conversion factors documented here clearly allow for more accurate estimates of average consumption of foods in the United States. In the current ERS data system, there is relatively little variation in many of the estimates for consumer-level food loss used in the LAFA data. For example, almost all fresh vegetables have a loss estimate of 20 percent; however, if RTI's proposed estimates are adopted, each fresh vegetable would have its own tailored loss estimate based on real data.[9]

[9]There are a few exceptions for some fresh vegetables for which an estimate could not be made.

Major Changes in Consumer-Level Food Loss Estimates

Major changes in the estimated consumer-level food loss conversion factors were described for each food category in the previous section. In summary, the estimates for the following foods indicate the largest (percentage-point) annual increases over the estimates currently used by ERS:

- Fresh pumpkin (49 percent)
- Dry whole and nonfat milk (40 percent)
- Dry buttermilk (40 percent)
- Swiss cheese (37 percent)
- Lard (35 percent)
- Edible beef tallow (35 percent)
- Fresh grapefruit (34 percent)
- Fresh tangerines (32 percent)
- Fresh cherries (31 percent)
- Eggnog (31 percent)

All of these foods have relatively low per capita consumption estimates. In contrast, the estimates for the following foods, which tend to have higher per capita consumption estimates, indicate the largest (percentage-point) annual decreases:

- Chicken (25 percent)
- Lamb (16 percent)
- Low-fat cottage cheese (16 percent)
- Frozen potatoes (16 percent)
- Veal (15 percent)
- Fresh potatoes (14 percent)
- Fresh tomatoes (13 percent)

- Fresh blueberries (12 percent)
- Beef (12 percent)
- Sour cream (12 percent)
- Fresh cauliflower (11 percent)
- Fresh spinach (11 percent)

Across all food categories, the estimates appear to indicate that consumer-level food loss is substantially higher than in current estimates; thus, the estimated average calories consumed by Americans are lower than in current estimates. The change in estimates could reflect changes in food preparation habits and the increase in food consumed away from home or simply the use of a different methodology than for the current estimates.

Strengths and Weaknesses of the Research Approach

Major strengths of the approach in this study are that it uses well-known data sources and that it describes and documents the methodology to a greater extent than in previous studies.

A major strength of the approach used in this analysis is that the consumer-level food loss conversion factors are based on an approach using well-known data sources for food purchases, consumer-level food availability, and food consumption. The methods are described and documented to a greater extent here than for the current estimates used in the ERS LAFA data series. Furthermore, in cases where expert panel estimates were used, the conversion factors are based on estimates from a clearly identified panel of experts. The estimates in this report can be updated easily as new information or better data sources become available.

The limitations of the approach occur primarily because of limitations in the underlying data sources or the unavailability of certain types of data. Many of these limitations were described earlier but are summarized here. With regard to the Nielsen Homescan data used in the analysis, some of the limitations are as follows:

- Certain types of purchases are likely missing because the method of data collection makes it difficult to enter these purchases (e.g., Homescan panelist purchases at farmers' markets and through community-supported agriculture). It would be difficult, if not impossible, for households to enter such purchases because the data collection method is set up to capture primary store purchases for foods with UPC codes. The result is that purchases of these foods may be underestimated.
- Foods that are self-produced (e.g., vegetables grown or fish caught) are not represented in the Homescan data because no purchase transaction occurred. Therefore, these foods are not represented in foods purchased but could be represented in foods consumed.
- Homescan data appear to underestimate all types of random-weight purchases, especially fresh fruits and vegetables. This underestimation likely derives from the use of a smaller panel that may not be as representative as the larger panel and the additional burden of entering random-weight foods in the data collection process. Although RTI used Perishables Group, Inc. data where available, the data were not available for all food categories and, in many cases, still did not result in plausible estimates of consumer-level food loss.

- Certain types of purchases that occur at times other than the primary shopping trip (e.g., milk purchased at a convenience story) may not be entered because of the additional burden. Households might be much less likely to record these purchases.

With regard to the NHANES consumption data, some of the limitations are as follows:

- Seasonality of data collection varies over the course of the year and might affect total consumption estimates. In particular, during the warm weather months, NHANES data are collected in northern States, and during the cold weather months, NHANES data are collected in southern States. This may affect estimates of consumption of seasonal foods (e.g., fresh fruit and vegetable consumption is higher when foods are in season and lower priced).
- Estimates of quantities consumed are approximations because they are based on respondents identifying which food model on a card is closest to the amount they consumed over the past 24 hours. Based on the consumption estimates for juice, NHANES respondents may have particular difficulty in estimating the amount of liquids consumed. A more precise method would be to weigh each food consumed, but this would be impractical from a data collection standpoint and would have a large influence on consumption choices.
- Certain foods might be misclassified during the data collection process (e.g., juices versus juice-containing drinks). However, the data collection methods are designed to overcome possible misclassification.
- The data collection process may induce respondents to overreport consumption of some foods and underreport consumption of others. In particular, respondents may overreport consumption of more healthful foods, such as milk, and underreport consumption of less healthful foods, such as butter.
- For some foods, few NHANES respondents reported consuming the food during the 24-hour recall period (see the footnotes in tables 3-8). Estimates of consumer-level food loss for these foods may be less reliable than those of foods with a larger number of respondents.

Finally, with regard to certain types of data that are unavailable:

- Data on purchases of foods from restaurants, cafeterias, and other away-from-home sources that could be used for detailed comparisons by food category are not available. Thus, RTI assumed that losses for food at home and away from home are similar. This assumption is reasonable given that spoilage loss is greater for food at home but plate waste is greater for food away from home; thus, the types of losses are offsetting.
- The estimation of consumption of foods in recipes is extremely data intensive and would be cost and time prohibitive. Furthermore, the use of data from recipes adds another layer of measurement error that might lead to greater imprecision in the estimates. Thus, RTI assumed that loss of food consumed directly is similar to loss of food as consumed in a recipe (e.g., fresh apples vs. apples in baked apple pie).

- Data are not available to disaggregate the source of loss, such as preparation/cooking loss, spoilage, or plate waste. Furthermore, it is not feasible to determine the degree to which other factors affect food loss, such as purchases of larger package sizes.

Recommendations for Future Work

Additional research could help improve the initial consumer-level food loss conversion factors provided in this report or provide estimates in cases for which they could not be derived.

The following recommendations for future work will be considered independently of ERS's decision on whether or not to adopt RTI's proposed estimates described here after the public comment period. In order of priority, RTI recommends the following additional work to further refine and develop estimates of consumer-level food loss:

- After ERS completes the separate but ongoing project to update food loss from primary weight to retail weight and adopts the updated loss estimates at this level, the estimated weights of food available at the consumer level will have been updated. Therefore, these updated estimates should be used to recalculate the consumer-level food loss conversion factors that were based on the LAFA data in the previous section. Then, the resulting estimates should be reviewed and compared with the Homescan-based estimates to make a final determination regarding which to use.
- For certain foods, the percentage of ingredient use should be further investigated to develop a more accurate estimate. All of the percentages of ingredient use were based on expert panel data. For most foods, these percentages appear to result in plausible estimates of consumer-level food loss. However, for the following foods, plausible loss estimates may be able to be calculated with more accurate ingredient percentages:
  - Plain whole milk
  - Fresh apples
  - Fresh bananas
  - Fresh pears
  - Fresh sweet corn
  - Fresh okra

  Initial exploratory analyses using data provided by USDA's Center for Nutrition Policy and Promotion (see Carlson et al., 2008) suggest that ingredient percentages could be calculated for these foods. If estimates using these foods are plausible, an expanded list of foods could be analyzed.

- For certain foods, RTI was unable to provide an estimate of consumer-level food loss because of limitations in the data used for the analysis. The foods affected include:
  - Plain 1 percent and 2 percent milk
  - Grapefruit juice
  - Lemon juice
  - Lime juice

– Orange juice
– Apple juice
– Cranberry juice
– Grape juice
– Pineapple juice
– Dry edible beans
– Dry edible peas and lentils
– White and whole wheat flour
– Durum flour
– Rye flour
– Corn flour and meal
– Corn hominy and grits
– Corn starch

For these foods, RTI recommends exploring additional data sources for estimating consumption or that ERS base the loss estimates on an average of the expert panel estimates.

Additionally, for each food (and type of processing in the case of fruits and vegetables) in the LAFA data series, loss estimates go back through 1970. Therefore, to the extent possible in future research, ERS may focus on determining whether, how, and why consumer-level food loss estimates for each food in the LAFA data may have varied over this time period. Also, with the growing abundance of multi-ingredient processed foods, future research could assess research methods to incorporate production, imports, and exports of processed foods.

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Appendix A:

Food Descriptions and Assumptions

Table A-1

Food Category Descriptions and Values Used for Count Data Conversion, Inedible and Solids Percentages, and Density Estimates

Category	Food	Description	Food-specific adjustment values (and NDB Number If available)[a]
Meat, poultry, fish	Beef	[For all meats: included random-weight and UPC cuts and ground beef. Excluded microwave dinners, lunch meats, and sausage.] For beef: included cuts (roasts, steaks, etc.), ground beef and beef patties; fresh and frozen; random weight and UPC. Excluded organ meats. Excluded meatloaf (combination beef and pork).	Inedible = 29% (13011—Beef, composite of retail cuts, lean, trimmed to 1/4 fat, all grades, raw) For count data, assumed 3-oz patties
Meat, poultry, fish	Veal	Included steaks, chops, other cuts, and ground veal; fresh and frozen; random weight and UPC. Excluded organs.	Inedible = 31% (17088—Veal, composite of trimmed retail cuts, separable lean and fat, raw)
Meat, poultry, fish	Pork	Included roasts, chops, ribs, other cuts, and ground pork; fresh and frozen; random weight and UPC. Included ham except for deli cut ham. Excluded bacon, chitlings, belly, tail, feet, hock, jowl, ear, and organs. Excluded pork BBQ because not reflected in consumption data.	Inedible = 30% (10002—Pork, fresh, composite of trimmed retail cuts [leg, loin, shoulder], separable lean only, raw) For count data, assumed ends and pieces = 48 oz; half boneless ham = 60 oz.
Meat, poultry, fish	Lamb	Included chops, roasts, other cuts, and ground lamb; fresh and frozen; random weight and UPC.	Inedible = 26.5% (average of 17001—Lamb, domestic, composite of trimmed retail cuts, separable lean and fat, trimmed to 1/4″ fat, choice, raw, and 17062 Lamb, New Zealand, imported, frozen, composite of retail cuts, separable lean and fat, raw)
Meat, poultry, fish	Chicken	Included whole chickens, parts, cuts, and ground chicken; fresh and frozen; random weight and UPC. Excluded chicken nuggets and patties (breaded products) and organs. Excluded Cornish hen.	Inedible = 29% (average of 05001—Chicken, broilers or fryers, meat and skin and giblets and neck, raw, and 05109—Chicken, roasting, meat and skin and giblets and neck, raw) For count data, assumed drumsticks = 1 pound.
Meat, poultry, fish	Turkey	Included whole turkeys, parts, cuts, and ground turkey; fresh and frozen; random weight and UPC. Excluded meat balls, breaded products, and organs.	Inedible = 21% (05163—Turkey, all classes, meat and skin and giblets and neck, raw)
Meat, poultry, fish	Fresh and frozen fish	Included all varieties of raw, random-weight fish (e.g., catfish, cod, tuna, salmon, whiting, and flounder). Included all varieties of UPC breaded and unbreaded frozen fish.	Inedible = 53% for round fish (FAO)
Meat, poultry, fish	Fresh and frozen shellfish	Included all varieties of raw, random-weight shellfish (e.g., shrimp, scallops, crab, oysters, clams, and lobster). Included all varieties of UPC breaded and unbreaded frozen shellfish.	Inedible = 63% (crustaceans in the shell [FAO]) Inedible = 75% (mollusks in the shell [FAO])
Meat, poultry, fish	Canned salmon	Included canned salmon, including Chinook. Reduced purchase weight based on liquid percentage because it is discarded (differs for packets versus cans). Included cakes, patties, loafs, and salads in consumption data (uses of canned salmon). Excluded salmon spreads and pates.	Solids = 81% (Canned: “Food Yields,” Table 1, Item 2242, Salmon: Canned: Contents of can: All samples), Solids = 99% (Pouch: Direct measurement)
Meat, poultry, fish	Canned sardines	Included canned sardines. Reduced purchase weight based on liquid percentage because it is discarded (differs for packets versus cans). Excluded smoked because included in cured fish.	Solids = 87% (Oil: “Food Yields,” Table 1, Item 2258, Sardines: Canned: Atlantic), Solids = 75% (Water: Direct measurement)

Continued—

Table A-1

Food Category Descriptions and Values Used for Count Data Conversion, Inedible and Solids Percentages, and Density Estimates—continued

Category	Food	Description	Food-specific adjustment values (and NDB number if available)[a]
Meat, poultry, fish	Canned tuna	Included canned tuna and tuna sandwich spreads. Reduced purchase weight based on liquid percentage because it is discarded (differs for packets versus cans). Included tuna salad spreads. Excluded smoked because included in cured fish. Included cakes, patties, loafs, and salads in consumption data (uses of canned tuna).	Solids = 82% (Oil: "Food Yields," Table 1, Item 2575, Tuna: Canned, contents of can: Solid pack, in oil), Solids = 79% (Water: "Food Yields," Table 1, Item 2571, Tuna: Canned, contents of can: Chunks, in brine), Solids = 94% (Pouch: "Food Yields," Table 1, Item 2573, Tuna: Canned, contents of can: Flakes, in oil)
Meat, poultry, fish	Canned shellfish	Included canned clams, crab, oysters, lobster, anchovies, and other canned shellfish varieties. Excluded canned seafood dips.	Solids = 45% (Clams: "Food Yields," Table 1, Item 880, Clams: Canned, minced or chopped, contents of can), Solids = 77% (Crabs: "Food Yields," Table 1, Item 962, Crab: Meat, canned), Solids = 54% (Oysters: Direct measurement), Solids = 64% (Shrimp: Direct measurement), Solids = 63% (All other shellfish)
Meat, poultry, fish	Other canned fish	Skipped because infeasible to align purchase and consumption categories.	
Meat, poultry, fish	Cured fish	Skipped because infeasible to align purchase and consumption categories.	
Eggs	Eggs	Included only chicken eggs in various forms. Included pickled eggs. Excluded prepared egg sandwiches.	Inedible = 12% for raw eggs (01123—Egg, whole, raw, fresh) For dried eggs, used shell egg equivalent of 5.326 oz dried = 1 dozen eggs. For frozen eggs, converted 20.282 oz = 1 dozen eggs. Converted dozen eggs to ounces based on size of eggs (e.g., large = 24 oz). Included frozen/refrigerated breakfasts that are primarily egg (e.g., egg pattie and egg mix).
Nuts	Peanuts	Included peanuts in cans, jars, and bags. Grouped peanuts and snack peanuts for estimating loss (not possible to differentiate in the purchase or consumption data). Excluded trail mixes and snack mixes with peanuts.	Unshelled converted to shelled using conversion factor (0.64).
Nuts	Peanut butter	Excluded other nut butters from the peanut butter category in the purchase data. Included half of peanut butter and jelly combinations.	
Nuts	Snack peanuts	Combined with "Peanuts" category.	
Nuts	Other peanuts	Combined with "Peanuts" category.	
Nuts	Almonds	Included whole and chopped almonds in cans, jars, bags, and in the shell (random weight and UPC). Excluded almond butter, almond meal, and trail mixes.	Inedible = 60% for unshelled almonds (12061—Nuts, almonds) Inedible = 0% for shelled almonds

Continued—

Table A-1

Food Category Descriptions and Values Used for Count Data Conversion, Inedible and Solids Percentages, and Density Estimates—continued

Category	Food	Description	Food-specific adjustment values (and NDB number If available)[a]
Nuts	Hazelnuts (filberts)	Included whole and chopped hazelnuts in cans, jars, bags, and in the shell (random weight and UPC).	Inedible = 54% for unshelled hazelnuts (12120—Nuts, hazelnuts, or filberts) Inedible = 0% for shelled hazelnuts
Nuts	Pecans	Included whole and chopped pecans in cans, jars, bags, and in the shell (random weight and UPC).	Inedible = 47% for unshelled pecans (12142—Nuts, pecans) Inedible = 0% for shelled pecans Counts for bags of unshelled pecans—assumed 1-pound bags.
Nuts	Pecans	Included whole and chopped pecans in cans, jars, bags, and in the shell (random weight and UPC).	Inedible = 47% for unshelled pecans (12142—Nuts, pecans) Inedible = 0% for shelled pecans Counts for bags of unshelled pecans—assumed 1-pound bags.
Nuts	Walnuts	Included whole and chopped walnuts in cans, bags, and in the shell (random weight and UPC).	Inedible = 55% for unshelled walnuts (12155—Nuts, walnuts, English) Inedible = 0% for shelled walnuts Counts for bags of unshelled walnuts—assumed 1-pound bags.
Nuts	Macadamia nuts	Included roasted and unroasted macadamia nuts in cans, bags, jars, and in the shell (random weight and UPC).	Inedible = 69% for unshelled macadamia nuts (12131—Nuts, macadamia nuts, raw) Inedible = 0% for shelled macadamia nuts Counts for bags of unshelled macadamias—assumed 1-pound bags.
Nuts	Pistachio nuts	Included pistachios in cans, bags, jars, and in the shell (random weight and UPC).	Inedible = 47% for unshelled pistachio nuts (12151—Nuts, pistachio nuts, raw) Inedible = 0% for shelled pistachio nuts Counts for bags of unshelled pistachios—assumed 1-pound bags.
Nuts	Other tree nuts	Included cashews, brazil nuts, mixed nuts, and pine nuts. Included cans, bags, jars, and in the shell (random weight and UPC). Cashews not sold in shell.	Inedible = 49% for unshelled brazil nuts (12078—Nuts, brazil nuts, dried, unblanched) Inedible = 23% for unshelled pine nuts (12147—Nuts, pine nuts, dried) Inedible = 50% for unshelled mixed nuts (average of all nuts) Inedible = 0% for shelled tree nuts Counts for bags of unshelled nuts—assumed 1-pound bags.
Nuts	Coconut	Included coconut chips, flakes, chunks, and strings. Included grated, shredded, and ground coconut.	
Dairy—Beverages	Plain whole milk	Included only cow milk in all milk categories. Included whole milk with or without vitamins A, C, and D, in refrigerated and shelf-stable forms. Included powdered milk in reconstituted equivalent. Included kosher and lactose-free varieties.	Density = 244 g/8 fluid oz = 1.0759 weight oz/fluid oz (01077—Milk, whole, 3.25% milk fat)
Dairy—Beverages	Plain 2% milk	Grouped 0.5%, 1%, 1.5%, and 2% milk into one low-fat milk category because consumption data have one reduced-fat milk category. Also included acidophilus and lactose-reduced varieties. Included shelf-stable milk and powdered milk in reconstituted equivalent.	Density = 244 g/8 fluid oz = 1.0759 weight oz/fluid oz (01079—Milk, reduced fat, fluid, 2% milk fat, with added vitamin A) Density = 244 g/8 oz = 1.0759 weight oz/fluid oz (01082—Milk, low-fat, fluid, 1% milk fat, with added vitamin A)

Continued—

Table A-1

Food Category Descriptions and Values Used for Count Data Conversion, Inedible and Solids Percentages, and Density Estimates—continued

Category	Food	Description	Food-specific adjustment values (and NDB number If available)[a]
Dairy—Beverages	Plain 1% milk	Combined with "Plain 2% milk" category.	
Dairy—Beverages	Skim milk	Included skim and nonfat milk, with or without vitamins A, C, and D. Also included lactose free, raw, and kosher. Included shelf-stable milk and powdered milk in reconstituted equivalent.	Density = 245 g/8 fluid oz = 1.0803 weight oz/fluid oz (01085—Milk, nonfat, fluid, with added vitamin A [fat free or skim])
Dairy—Beverages	Buttermilk	Included nonfat, 1%, and 2% buttermilk.	Density = 245 g/8 fluid oz = 1.0803 weight oz/fluid oz (01088—Milk, buttermilk, fluid, cultured, low fat)
Dairy—Beverages	Whole flavored milk	Included only chocolate flavored whole milk (excluded banana, blue raspberry, strawberry, etc.) because only chocolate is included in consumption data.	Density = 250 g/8 fluid oz = 1.1023 weight oz/fluid oz (01102—Milk, chocolate, fluid, commercial, whole)
Dairy—Beverages	Low-fat flavored milk	Included only chocolate flavored low-fat milk (e.g., banana, strawberry, and blue raspberry) because only chocolate is included in consumption data. Included nonfat, 0.5%, 1%, 1.5%, and 2% fat.	Density = 250 g/8 fluid oz = 1.1023 weight oz/fluid oz (01103—Milk, chocolate, fluid, commercial, reduced fat) Density = 250 g/8 fluid oz = 1.1023 weight oz/fluid oz (01104—Milk, chocolate, fluid, commercial, low fat)
Dairy—Beverages	Light cream	Combined heavy cream, light cream, and half and half. Included whipping cream with light and heavy cream. Products may be refrigerated, frozen, or canned. Included canned cream. Excluded nondairy creamer.	Table, light, heavy cream used average density = 239 g/8 fluid oz = 1.0538 weight oz/fluid oz (240,239,238 g) (01050—Cream, fluid, light (coffee cream or table cream), 01052—Cream, fluid, light whipping, 01053—Cream, fluid, heavy whipping) Density = 60 g/8 fluid oz = 0.2646 weight oz/fluid oz (01054—Cream, whipped, cream topping, pressurized) Density = 242 g/8 fluid oz = 1.0670 weight oz/fluid oz (01049—Cream, fluid, half and half)
Dairy—Beverages	Heavy cream	Combined with "Light cream" category.	
Dairy—Beverages	Eggnog	Consumption data include reduced and whole fat milk eggnog.	Density = 254 g/8 fluid oz = 1.1199 weight oz/fluid oz (01057—Eggnog)
Dairy	Sour cream	Included sour cream in regular, light, and fat-free forms. Excluded imitation (nondairy) sour cream. Excluded sour cream dips.	
Dairy	Cream cheese	Included cream cheese in regular or lite forms. Included flavored cream cheese. Included Neufchatel. Excluded imitation (nondairy) cream cheese. Excluded cream cheese dips.	
Dairy	Cheddar cheese	Included random-weight and UPC mild, medium, sharp, and extra sharp cheddar cheese.	
Dairy	Other American cheese	Included random-weight and UPC Colby, Monterey jack, and pepper jack.	

Continued—

Table A-1

Food Category Descriptions and Values Used for Count Data Conversion, Inedible and Solids Percentages, and Density Estimates—continued

Category	Food	Description	Food-specific adjustment values (and NDB number If available)[a]
Dairy	Provolone cheese	Included random-weight and UPC provolone cheese.	
Dairy	Romano cheese	Included random-weight and UPC Romano and parmesan cheese. Also included grated and shredded forms because it is included in the consumption data.	
Dairy	Parmesan cheese	Combined with “Romano cheese” category.	
Dairy	Mozzarella cheese	Included random-weight and UPC nonfat, low-fat, and whole mozzarella, including pizza cheese.	
Dairy	Ricotta cheese	Included random-weight and UPC low-fat and regular ricotta cheese.	
Dairy	Other Italian cheese	Skipped because infeasible to align purchase and consumption categories.	
Dairy	Swiss cheese	Included random-weight and UPC Swiss, baby Swiss, and gruyere cheese.	
Dairy	Brick cheese	Included random-weight and UPC plain brick and salami-flavored brick cheese.	
Dairy	Muenster cheese	Included random-weight and UPC low-fat and regular Muenster cheese.	
Dairy	Blue cheese	Included random-weight and UPC blue Roquefort, gorgonzola, and Stillton cheese, in crumbles or bricks.	
Dairy	Other miscellaneous cheese	Included random-weight and UPC edam, gouda, and limburger (ERS definition). Excluded cheese balls and cheese logs from consumption estimate (unless these were included under a specific cheese type). Excluded goat cheese.	
Dairy	Processed cheese	Included random-weight and UPC American cheese. Included processed cheese slices, snacks, and loaves.	
Dairy	Processed cheese foods and spreads	Included cheese spreads and sauces, plain and with flavorings such as bacon, nacho, jalapeno, and ham. Excluded imitation cheese products.	Density = 63 g/2 fluid oz = 1.1111 weight oz/ fluid oz (06930—Sauce, cheese, ready-to-serve)
Dairy	Regular cottage cheese	Included regular plain and flavored cottage cheese, including with fruit or vegetables. Excluded farmer’s cheese and cottage cheese gelatin desserts.	

Continued—

Table A-1

Food Category Descriptions and Values Used for Count Data Conversion, Inedible and Solids Percentages, and Density Estimates—continued

Category	Food	Description	Food-specific adjustment values (and NDB number If available)[a]
Dairy	Low-fat cottage cheese	Included nonfat, 1%, and 2% plain and flavored cottage cheese, including with fruit or vegetables.	
Dairy	Regular ice cream	Included regular, rich, and softserve ice cream in all flavors. (Deleted 5 count records, could not determine size.)	Density = 66 g/4 fluid oz = 0.5820 weight oz/ fluid oz (19095—Ice creams, vanilla)
Dairy	Low-fat ice cream (ice milk)	Included sherbet, ice milk, and light or fat-free ice cream.	Density of ice cream = 68 g/4 fluid oz = 0.5997 weight oz/fluid oz (19260—Ice creams, vanilla, light, no sugar added)
Dairy	Frozen yogurt and other miscellaneous frozen products	Included frozen yogurt in all flavors. (In the purchase data, frozen novelties are in counts only; therefore, total weight is not calculable.)	
Dairy	Refrigerated yogurt	Included plain and flavored yogurt in nonfat, low-fat, and whole milk varieties. Includes sweetened with sugar or low calorie sweeteners. Excluded yogurt shakes, dips, drinks, and smoothies.	
Dairy	Total evaporated and condensed canned whole and skim milk	Included whole, 2%, and skim evaporated and condensed (sweetened) milk. Included diluted and undiluted forms in consumption data. Included "filled" types.	Density = 306 g/8 fluid oz = 1.3492 weight oz/ fluid oz (01095—Milk, canned, condensed, sweetened) Density = 256 g/8 fluid oz = 1.1288 weight oz/ fluid oz (01097—Milk, canned, evaporated, nonfat) Density = 244 g/8 fluid oz = 1.0759 weight oz/ fluid oz (01075—Milk substitutes, fluid with hydrogenated vegetable oils)
Dairy	Dry whole and nonfat milk	Included nonfat, low-fat, and whole dry milk. In consumption data, included both reconstituted and nonreconstituted. Excluded goat and soy types.	Density = 244 g/8 fluid oz = 1.0759 weight oz/ fluid oz (01077—Milk, whole, 3.25% milk fat)
Dairy	Dry buttermilk	Included dry (powdered) buttermilk. In consumption data, included both reconstituted and nonreconstituted forms.	Density = 245 g/8 fluid oz = 1.0803 weight oz/fluid oz (01088—Milk, buttermilk, fluid, cultured, low-fat)
Fats and oils	Butter	Included tubs, sticks, and whipped butter, in salted and unsalted. Split butter-margarine tubs and sticks between butter and margarine categories.	For count data, assumed 1 pound of butter.
Fats and oils	Margarine	Included tubs, sticks, and whipped margarine and spreads with margarine (e.g., veg oil-butter spread, margarine-like spread). Included nonfat, reduced fat, and regular types. Split butter-margarine tubs and sticks between butter and margarine categories.	
Fats and oils	Lard	Skipped because consumption data are not available.	
Fats and oils	Edible beef tallow	Skipped because consumption and purchase data are not available.	
Fats and oils	Shortening	Skipped because consumption data are not available.	

Continued—

Table A-1

Food Category Descriptions and Values Used for Count Data Conversion, Inedible and Solids Percentages, and Density Estimates—continued

Category	Food	Description	Food-specific adjustment values (and NDB number If available)[a]
Fats and oils	Salad and cooking oils	Included salad and cooking oil (corn, olive, peanut, canola, soybean, and other types) and cooking spray. Included all types of salad dressings and mayonnaise.	Density = 218 g/8 fluid oz = 0.9612 weight oz/fluid oz (04582—Oil, vegetable, canola, 04670—USDA Commodity Food, oil, vegetable, low saturated fat) Density = 245 g/8 fluid oz = 1.0803 weight oz/fluid oz (04015—Salad dressing, Russian dressing)
Fats and oils	Other edible fats and oils	Skipped because infeasible to align purchase and consumption categories.	
Fruits—Fresh	Fresh oranges	Included random-weight and UPC oranges and refrigerated cut oranges. Included temples with oranges.	Inedible = 27% (09200—Oranges, raw, all commercial varieties [fruit (2 5/8 diameter)]) For count data, assumed 1 orange = 131 g.
Fruits—Fresh	Fresh tangerines	Included random-weight and UPC tangerines, tangelos, and mandarin oranges with tangerines (NHANES groups mandarins with tangerines) and refrigerated cut tangerines.	Inedible = 26% (09218—Tangerines [mandarin oranges], raw [medium (2½″ diameter)]) For count data, assumed 1 tangerine = 88 g.
Fruits—Fresh	Fresh grapefruit	Included random-weight and UPC grapefruit and refrigerated cut grapefruit.	Inedible = 50% (09111—Grapefruit, raw, pink and red and white, all areas [medium (approx 4″ diameter)]) For count data, assumed 1 grapefruit = 256 g.
Fruits—Fresh	Fresh lemons	Included random-weight and UPC lemons. Split bags of lemons and limes between the two product categories.	Inedible = 47% (09150—Lemons, raw, without peel) For count data, assumed 1 lemon = 71 g.
Fruits—Fresh	Fresh limes	Included random-weight and UPC limes. Split bags of lemons and limes between the two product categories.	Inedible = 16% (09159—Limes, raw) For count data, assumed 1 lime = 67 g.
Fruits—Fresh	Fresh apples	Included random-weight and UPC apples of all varieties and refrigerated cut apple chunks. Excluded candy kits, candy or caramel apples, and prepared apple salads.	Inedible = 10% (09003—Apples, raw, with skin [medium (3″ diameter)]) For count data, assumed 1 apple = 182 g.
Fruits—Fresh	Fresh apricots	Included random-weight and UPC apricots.	Inedible = 7% (09021—Apricots, raw) For count data, assumed 1 apricot = 35 g.
Fruits—Fresh	Fresh avocados	Included random-weight and count avocados.	Inedible = 26% (09037—Avocados, raw, all commercial varieties) For count data, assumed 1 avocado = 201 g.
Fruits—Fresh	Fresh bananas	Included random-weight and UPC bananas.	Inedible = 36% (09040—Bananas, raw [medium (7″ to 7 7/8″ long)]) For count data, assumed 1 banana = 118 g and 1 bunch = 7 bananas.
Fruits—Fresh	Fresh blueberries	Included random-weight and UPC blueberries.	Inedible = 5% (09050—Blueberries, raw)
Fruits—Fresh	Fresh cantaloupe	Included random-weight and UPC cantaloupe and refrigerated cut cantaloupe chunks.	Inedible = 49% (09181—Melons, cantaloupe, raw [melon, medium (about 5″ diameter)]) For count data, assumed 1 cantaloupe = 552 g.
Fruits—Fresh	Fresh cherries	Included random-weight and UPC cherries.	Inedible = 8% (09070—Cherries, sweet, raw)

Continued—

Table A-1

Food Category Descriptions and Values Used for Count Data Conversion, Inedible and Solids Percentages, and Density Estimates—continued

Category	Food	Description	Food-specific adjustment values (and NDB number if available)[a]
Fruits—Fresh	Fresh cranberries	Included fresh, frozen, and canned cranberries (no other cranberry categories in the data system). Excluded shelf-stable cranberry sauces.	Inedible = 2% (09078—Cranberries, raw)
Fruits—Fresh	Fresh grapes	Included random-weight and UPC grapes.	Inedible = 4% (Skin not considered inedible) (09132—Grapes, red or green [European type, such as Thompson seedless], raw)
Fruits—Fresh	Fresh honeydew	Included random-weight and UPC honeydew and refrigerated cut honeydew chunks.	Inedible = 54% (09184—Melons, honeydew, raw) For count data, assumed 1 honeydew = 1140 g.
Fruits—Fresh	Fresh kiwi	Included random-weight and UPC kiwi and refrigerated cut kiwi.	Inedible = 14% (09148—Kiwi fruit [Chinese gooseberries], fresh, raw) For count data, assumed 1 kiwi = 83.5 g.
Fruits—Fresh	Fresh mangoes	Included random-weight and UPC mangoes and refrigerated cut mango chunks.	Inedible = 31% (09176—Mangoes, raw) For count data, assumed 1 mango = 207 g.
Fruits—Fresh	Fresh peaches	Included random-weight and UPC peaches and refrigerated cut peaches.	Inedible = 4% (09236—Peaches, raw [medium (2 2/3″ diameter)]) For count data, assumed 1 peach = 150 g.
Fruits—Fresh	Fresh pears	Included random-weight and UPC pears and refrigerated cut pear chunks.	Inedible = 10% (09252—Pears, raw [medium]) For count data, assumed 1 pear = 178 g.
Fruits—Fresh	Fresh pineapple	Included random-weight and UPC pineapples and refrigerated cut pineapple chunks. Split cut mixtures with one other fruit. Excluded fruit medleys with pineapple.	Inedible = 49% (09266—Pineapple, raw, all varieties) For count data, assumed 1 pineapple = 905 g.
Fruits—Fresh	Fresh papaya	Included random-weight and UPC papayas and refrigerated cut papaya. Split cut mixtures with one other fruit.	Inedible = 33% (09226—Papayas, raw [medium (5 1/8″ long x 3″ diameter)]) For count data, assumed 1 papaya = 304 g.
Fruits—Fresh	Fresh plums	Included random-weight and UPC plums.	Inedible = 6% (09279—Plums, raw [fruit (2 1/8″ diameter)]) For count data, assumed 1 plum = 66 g.
Fruits—Fresh	Fresh strawberries	Included random-weight and UPC strawberries and refrigerated cut strawberries.	Inedible = 6% (09316—Strawberries, raw [medium (1¼″ diameter)]) For count data, assumed 1 strawberry = 12 g.
Fruits—Fresh	Fresh watermelon	Included random-weight and UPC watermelon and refrigerated cut watermelon.	Inedible = 48% (09326—Watermelon, raw (melon [15″ long x 7½″ diameter)]) For count data, assumed 1 watermelon = 4518 g.
Fruits—Canned	Canned apples and applesauce	Included applesauce in cans and jars, sweetened and unsweetened. Included ready-to-serve fruit cups. Included flavored apple sauces. Excluded pie and pastry fillings (ingredient), glazes, butters, jams, jellies, preserves, spreads, and relishes. Excluded baby foods.	Solids = 87% (Apples: "Food Yields," Table 1, Item 52, Apples: Canned, contents of can: Sliced, unspecified)
Fruits—Canned	Canned apricots	Included canned apricots including ready-to-serve fruit cups packed in water, juice, or syrup. Included pickled apricots. Excluded pie and pastry fillings (ingredient), relishes, jams, marmalade, preserves, spreads, and butters. Excluded baby foods.	Solids = 59% ("Food Yields," Table 1, Item 74, Apricots: Canned, contents of can: Halves: All samples in syrup or water)

Continued—

Table A-1

Food Category Descriptions and Values Used for Count Data Conversion, Inedible and Solids Percentages, and Density Estimates—continued

Category	Food	Description	Food-specific adjustment values (and NDB number If available)[a]
Fruits—Canned	Canned cherries	Included canned cherries packed in water, juice, or syrup. Included maraschino cherries. Excluded pie and pastry fillings, jams, jellies, fruit spreads, and fruit salads.	Solids = 69% ("Food Yields," Table 1, Item 533, Cherries: Canned, contents of can: Sour, red pitted: All samples)
Fruits—Canned	Canned peaches	Included canned peaches packed in water, juice, or syrup. Split canned peach and pear mixtures. Excluded pie and pastry fillings, glazes, preserves, fruit salads, and gelatin desserts. Excluded baby food.	Solids = 60% ("Food Yields," Table 1, Item 1666, Peaches: Canned, contents of can: All samples)
Fruits—Canned	Canned pears	Included canned pears packed in water, juice, or syrup. Split pear and peach mixtures. Excluded preserves and gelatin desserts. Excluded baby food.	Solids = 59% ("Food Yields," Table 1, Item 1735, Pears: Canned, contents of can [halves]: All samples)
Fruits—Canned	Canned pineapple	Included canned pineapple packed in water, juice, or syrup. Split canned pineapple mixtures with one other fruit. Excluded pie and pastry fillings, gelatin desserts, and fruit salad desserts.	Solids = 65% ("Food Yields," Table 1, Item 1843, Pineapple: Canned, contents of can: All samples, all styles)
Fruits—Canned	Canned plums	Included canned plums packed in water, juice, or syrup. Included pickled plums. Excluded preserves and baby food.	Solids = 56% ("Food Yields," Table 1, Item 1886, Plums: Canned, contents of can: All samples)
Fruits—Canned	Canned olives	Included green, black, and stuffed olives. Excluded ready-made olive salads.	Solids = 63% (Unpitted: "Food Yields," Table 1, Item 1560, Olives: Green, contents of can, unspecified size: Plain: Unpitted) Solids = 64% (Stuffed: "Food Yields," Table 1, Item 1562, Olives: Green, contents of can, unspecified size: Plain: Stuffed)
Fruits—Frozen	Frozen blackberries	Included whole frozen blackberries.	
Fruits—Frozen	Frozen blueberries	Included whole frozen blueberries.	
Fruits—Frozen	Frozen cherries	Included whole frozen cherries.	
Fruits—Frozen	Frozen raspberries	Included whole frozen raspberries.	
Fruits—Frozen	Frozen strawberries	Included whole and sliced frozen strawberries.	
Fruits—Frozen	Other frozen berries	Skipped because infeasible to align purchase and consumption categories.	
Fruits—Frozen	Frozen apples	Skipped because consumption data are not available.	
Fruits—Frozen	Frozen apricots	Skipped because purchase data are insufficient.	
Fruits—Frozen	Frozen peaches	Included sliced frozen peaches.	
Fruits—Frozen	Frozen plums	Skipped because consumption data are not available.	
Fruits—Frozen	Other frozen fruit	Purchase data includes mango, rhubarb, pineapple, papaya, passion fruit, guava, etc.	

Continued—

Table A-1

Food Category Descriptions and Values Used for Count Data Conversion, Inedible and Solids Percentages, and Density Estimates—continued

Category	Food	Description	Food-specific adjustment values (and NDB number If available)[a]
Fruits—Dried	Dried apples	Included dried apple chunks, rings, and fruit leathers. Excluded apple chips.	
Fruits—Dried	Dried apricots	Included dried apricots and apricot fruit rolls and leathers. Excluded trail mixes with apricots.	
Fruits—Dried	Dried dates	Whole and chopped dates.	Reduced weight of dates with pits by 15%.
Fruits—Dried	Dried figs	Included all varieties of dried figs.	
Fruits—Dried	Dried peaches	Included dried whole, sliced, and chunk peaches and peach fruit rolls and leathers.	
Fruits—Dried	Dried pears	Included dried whole and slices pears.	
Fruits—Dried	Dried plums	Included dried whole plums and pieces.	Reduced weight of plums with pits by 13%.
Fruits—Dried	Raisins	Included raisins in canisters, boxes, and bags. Split raisin and dried fruit mixtures with at most one other fruit (of any type).	
Fruits—Juices	Grapefruit juice	[For all juices: Included juice concentrate (converted to reconstituted equivalent by multiplying by 4). Included juice mixtures if only two juices (split between the juices). Excluded powders, juice flavored “drinks,” syrups, extracts, and nectars. In purchase data, included product if description indicated JC for juice and excluded product if description indicated DR for juice drink.] Included refrigerated, frozen, and shelf-stable grapefruit juice.	Density = 247 g/8 fluid oz = 1.0891 weight oz/fluid oz (09123—Grapefruit juice, white, canned, unsweetened)
Fruits—Juices	Lemon juice	Included refrigerated, frozen concentrate, and shelf-stable lemon juice. Excluded lemonade.	Density = 244 g/8 fluid oz = 1.0759 weight oz/fluid oz (09153—Lemon juice, canned or bottled)
Fruits—Juices	Lime juice	Included refrigerated, frozen concentrate, and shelf-stable lime juice. Excluded limeade.	Density = 246 g/8 fluid oz = 1.0847 weight oz/fluid oz (09161—Lime juice, canned or bottled, unsweetened)
Fruits—Juices	Orange juice	Included refrigerated, frozen concentrate, and shelf-stable orange juice. Split orange juice mixtures with up to one other juice.	Density = 249 g/8 fluid oz = 1.0979 weight oz/fluid oz (09207—Orange juice, canned, unsweetened)
Fruits—Juices	Apple juice	Included apple juice and cider in cans and bottles. Included frozen concentrate. Included nonalcoholic sparkling apple juices. Split apple juice mixtures with up to one other juice. Excluded apple-flavored fruit drinks and sodas. Excluded baby juices.	Density = 248 g/8 fluid oz = 1.0935 weight oz/fluid oz (09016—Apple juice, canned or bottled, unsweetened, without added ascorbic acid)
Fruits—Juices	Cranberry juice	Included refrigerated, frozen concentrate, and shelf-stable cranberry juice and juice cocktail. Split cranberry juice mixtures with up to one other juice.	Density = 253 g/8 fluid oz = 1.1155 weight oz/fluid oz (43382—Cranberry juice, unsweetened)
Fruits—Juices	Grape juice	Included refrigerated, frozen concentrate, and shelf-stable grape juice. Split grape juice mixtures with up to one other juice. Excluded baby juices.	Density = 253 g/8 fluid oz = 1.1155 weight oz/fluid oz (09135—Grape juice, canned or bottled, unsweetened, without added vitamin C)

Continued—

Table A-1

Food Category Descriptions and Values Used for Count Data Conversion, Inedible and Solids Percentages, and Density Estimates—continued

Category	Food	Description	Food-specific adjustment values (and NDB number If available)[a]
Fruits—Juices	Pineapple juice	Included refrigerated, frozen concentrate, and shelf-stable pineapple juice. Split pineapple juice mixtures with up to one other juice.	Density = 250 g/8 fluid oz = 1.1023 weight oz/fluid oz (09273—Pineapple juice, canned, unsweetened, without added ascorbic acid)
Fruits—Juices	Prune juice	Included refrigerated and shelf-stable prune juice.	Density = 256 g/8 fluid oz = 1.1288 weight oz/fluid oz (09294—Prune juice, canned)
Vegetables—Fresh	Fresh artichokes	Included canned (including pickled), fresh, and frozen to correspond to the food availability definition. Included random-weight and UPC artichokes. Excluded artichoke salads.	Inedible = 60% (11007—Artichokes [globe or French], raw [artichoke, medium]) For count data, assumed 1 artichoke = 128 g. Assumed 100% of NFS consumption is fresh.
Vegetables—Fresh	Fresh asparagus	Included random-weight and UPC fresh asparagus.	Inedible = 47% (11011—Asparagus, raw [spear, medium (5¼″ to 7″ long)]) For count data, assumed 1 spear = 16 g and 1 bunch = 36 spears. Assumed 81% of NFS consumption is fresh.
Vegetables—Fresh	Fresh bell peppers	Included random-weight and UPC fresh peppers and refrigerated cut bell peppers. Included fresh cut mixtures with up to one other vegetable (split).	Inedible = 18% (11333—Peppers, sweet, green, raw (medium [approx 2¾″ long, 2½″ diameter)]) For count data, assumed 1 pepper = 119 g.
Vegetables—Fresh	Fresh broccoli	Included random-weight and UPC broccoli and refrigerated cut broccoli. Included refrigerated cut mixtures with up to one other vegetable (split). Included broccoli. Excluded broccoli sprouts, broccoli rabe, and broccoflower. Excluded dip trays.	Inedible = 39% (11090—Broccoli, raw) For count data, assumed 1 bunch = 608 g. Assumed 69% of NFS consumption is fresh.
Vegetables—Fresh	Fresh brussels sprouts	Included random-weight and UPC brussels sprouts.	Inedible = 10% (11098—brussels sprouts, raw) For count data, assumed 1 sprout = 19 g. Assumed 100% of NFS consumption is fresh.
Vegetables—Fresh	Fresh cabbage	Included random-weight and UPC cabbage heads, Chinese cabbage, and refrigerated shredded cabbage. Excluded cabbage sprouts.	Inedible = 20% (11109—Cabbage, raw (head, medium [about 5¾″ diameter)]) For count data, assumed 1 cabbage = 908 g.
Vegetables—Fresh	Fresh carrots	Included random-weight and UPC carrots and refrigerated cut carrots. Included fresh cut carrot mixtures with up to one other vegetable (split). Excluded dip trays.	Inedible = 11% (11124—Carrots, raw [medium]) For count data, assumed 1 carrot = 61 g and 1 bunch = 5 carrots. Assumed 74% of NFS consumption is fresh.
Vegetables—Fresh	Fresh cauliflower	Included random-weight and UPC cauliflower and refrigerated cut cauliflower. Included fresh cut cauliflower mixtures with up to one other vegetable (split).	Inedible = 61% (11135—Cauliflower, raw [head, medium (5″ to 6″ diameter)]) For count data, assumed 1 cauliflower = 575 g. Assumed 80% of NFS consumption is fresh.
Vegetables—Fresh	Fresh celery	Included random-weight and UPC celery and refrigerated cut celery. Included fresh cut celery mixtures with up to one other vegetable (split). Excluded dip trays.	Inedible = 11% (11143—Celery, raw [stalk, medium (7½″ to 8″ long)]) For count data, assumed 1 stalk = 40 g and 1 bunch = 8 stalks.
Vegetables—Fresh	Fresh collard greens	Included random-weight and UPC collard greens. Assumed 100% of NFS consumption is fresh.	Inedible = 43% (11161—Collards, raw) For count data, assumed 1 pound of greens.
Vegetables—Fresh	Fresh sweet corn	Included random-weight and UPC corn ears and cut corn. Included fresh cut mixtures with up to one other vegetable (split).	Inedible for corn on the cob = 64% (11167—Corn, sweet, yellow, raw [ear, medium (6¾″ to 7½″ long) yields]) For count data, assumed 1 ear = 90 g. Assumed 35% of NFS consumption is fresh.

Continued—

Table A-1

Food Category Descriptions and Values Used for Count Data Conversion, Inedible and Solids Percentages, and Density Estimates—continued

Category	Food	Description	Food-specific adjustment values (and NDB number If available)[a]
Vegetables—Fresh	Fresh cucumbers	Included random-weight and UPC cucumbers.	Inedible = 27% (11206—Cucumber, peeled, raw [medium]) For count data, assumed 1 cucumber = 201 g.
Vegetables—Fresh	Fresh eggplant	Included random-weight and UPC eggplant.	Inedible = 19% (11209—Eggplant, raw [eggplant, unpeeled (approx 1¼ lb)]) For count data, assumed 1 eggplant = 548 g.
Vegetables—Fresh	Fresh escarole and endive	Combined with "Fresh head lettuce" category.	Inedible = 14% (11213—Endive, raw) For count data, endive = 513 g and lettuce = 539 g.
Vegetables—Fresh	Fresh garlic	Included random-weight and UPC garlic. Excluded garlic sprouts.	Inedible = 13% (11215—Garlic, raw) For count data, assumed 1 clove = 3 g and 1 head = 13 cloves.
Vegetables—Fresh	Fresh kale	Included random-weight and UPC kale. Included fresh cut mixtures with up to one other vegetable (split).	Inedible = 39% (11233—Kale, raw) For count data, assumed 1 pound of greens.
Vegetables—Fresh	Fresh head lettuce	Included random-weight and UPC lettuce. Combined category for head lettuce, leaf lettuce, escarole, endive, and chicory. Included bunches, heads, and lettuce mixes. Excluded kits with dressing because most of weight is dressing.	Inedible = 26% (11250—Lettuce, butterhead [includes Boston and bibb types], raw) Inedible = 5% (11252—Lettuce, iceberg [includes crisphead types], raw) Inedible = 6% (11251—Lettuce, cos or romaine, raw) Inedible = 28% (11253—Lettuce, green leaf, raw) Inedible = 28% (11257—Lettuce, red leaf, raw) Inedible = 18% (All other lettuce—avg) For count data, assumed 1 head = 539 g.
Vegetables—Fresh	Fresh romaine and leaf lettuce	Combined with "Fresh head lettuce" category.	
Vegetables—Fresh	Fresh lima beans	Included random-weight and UPC lima beans.	For count data, assumed 1 pound of beans.
Vegetables—Fresh	Fresh mushrooms	Included all varieties of random-weight and UPC mushrooms.	Inedible = 3% (11260—Mushrooms, white, raw [medium]) Inedible = 3% (11265—Mushrooms, portabella, raw) For count data, assumed white mushrooms = 18 g and portabella = 84 g.
Vegetables—Fresh	Fresh mustard greens	Included random-weight and UPC mustard greens. Included fresh cut mixtures with up to one other vegetable (split).	Inedible = 7% (11270—Mustard greens, raw) For count data, assumed 1 pound of greens.
Vegetables—Fresh	Fresh okra	Included random-weight and UPC okra. Included fresh cut mixtures with up to one other vegetable (split).	Inedible = 14% (11278—Okra, raw) Assumed 100% of NFS consumption is fresh.
Vegetables—Fresh	Fresh onions	Included random-weight and UPC fresh onions, green onions, and canned onions. Split fresh cut mixtures with up to one other vegetable (split).	Inedible = 10% (11282—Onions, raw [medium (2½˝ diameter)]) For count data, assumed 1 onion = 110 g. Assumed 94% of NFS consumption is fresh.
Vegetables—Fresh	Fresh potatoes	Included random-weight and bagged potatoes.	Inedible = 25% (11352—Potato, flesh and skin, raw [Potato medium (2¼˝ to 3¼˝ diameter)]) For count data, assume 1 medium potato = 213 g.

Continued—

Table A-1

Food Category Descriptions and Values Used for Count Data Conversion, Inedible and Solids Percentages, and Density Estimates—continued

Category	Food	Description	Food-specific adjustment values (and NDB number If available)[a]
Vegetables—Fresh	Fresh pumpkin	Included random-weight and UPC pumpkins. Excluded pie filling.	Inedible = 30% (11422—Pumpkin, raw) For count data, assumed 1 pumpkin = 10 pounds. Assumed 100% of NFS consumption is fresh.
Vegetables—Fresh	Fresh radishes	Included random-weight and UPC radish bunches and refrigerated cut radishes. Excluded radish sprouts.	Inedible = 10% (11429—Radishes, raw [medium (¾˝ to 1˝ diameter)]) For count data, assumed 1 radish = 4.5 g.
Vegetables—Fresh	Fresh snap beans	Included random-weight and UPC green beans, wax beans, and French beans. Included fresh cut mixtures with up to one other vegetable (split).	Inedible = 12% (11052—Beans, snap, green, raw) Assumed 25% of NFS consumption is fresh.
Vegetables—Fresh	Fresh spinach	Included random-weight and UPC spinach bunches and packaged salads. Excluded salad kits with dressing because majority of weight is due to dressing.	Inedible = 28% (11457—Spinach, raw) For count data, assumed 1 bunch = 340 g. Assumed 67% of NFS consumption is fresh.
Vegetables—Fresh	Fresh squash	Included random-weight and UPC squash. Included fresh, canned (including pickled), and frozen. Included fresh cut mixtures with up to one other vegetable (split).	Inedible = 5% (11641—Squash, summer, all varieties, raw [medium]) Inedible = 21% (All other winter varieties) Solids = 61% ("Food Yields," Table 1, Item 2453, Squash, summer: Canned, yellow, cut, contents of can, all samples) For count data, assumed 1 squash = 196 g.
Vegetables—Fresh	Fresh sweet potatoes	Included fresh, canned, and frozen sweet potatoes and yams (ERS groups all in the fresh sweet potato category). Included canned sweet potatoes and yams in syrup. Excluded sweet potato pie filling.	Inedible = 28% (11507—Sweet potato, raw, unprepared [sweet potato, 5˝ long]) Solids = 65% ("Food Yields," Table 1, Item 2507, Sweet potatoes: Canned, contents of can: Syrup pack: All samples) For count data, assumed 1 medium potato = 130 g.
Vegetables—Fresh	Fresh tomatoes	Included random-weight and UPC tomatoes. Included cherry tomatoes. Included fresh cut mixtures with up to one other vegetable (split).	Inedible = 9% (11529—Tomatoes, red, ripe, raw, year round average [medium whole (2 3/5˝ diameter)]) For count data, assumed 1 tomato = 123 g. Assumed 22% of NFS consumption is fresh.
Vegetables—Fresh	Fresh turnip greens	Included random-weight and UPC turnip greens. Included fresh cut mixtures with up to one other vegetable (split).	Inedible = 30% (11568—Turnip greens, raw) For count data, assumed 1 pound of greens.
Vegetables—Canned	Canned asparagus	Included canned and pickled asparagus. Excluded canned soups.	Solids = 60% ("Food Yields," Table 1, Item 103, Asparagus: Canned, contents of can: All samples, cut spears, spears, or tips, all can sizes) Assumed 15% of NFS consumption is canned.
Vegetables—Canned	Canned snap beans	Included canned pole beans, green beans, string beans, and wax beans. Included half of green bean mixtures with one other vegetable. Excluded bean salad (multiple beans) and baby food.	Solids = 58% ("Food Yields," Table 1, Item 206, Beans: Snap, green, and wax: Canned, contents of can: All samples, including unspecified) Assumed 49% of NFS consumption is canned.
Vegetables—Canned	Canned cabbage (sauerkraut)	Included red, snow, and regular cabbage. Included kim chee, sauerkraut, and other pickled cabbage. Included refrigerated sauerkraut. Excluded cabbage relishes. Excluded canned soups.	Solids = 88% ("Food Yields," Table 1, Item 2272, Sauerkraut: Canned, contents of can: All samples)

Continued—

Table A-1

Food Category Descriptions and Values Used for Count Data Conversion, Inedible and Solids Percentages, and Density Estimates—continued

Category	Food	Description	Food-specific adjustment values (and NDB number If available)[a]
Vegetables—Canned	Canned carrots	Included canned and pickled carrots. Included half of carrot mixtures with one other vegetable (e.g., peas and carrots). In consumption data, included creamed and glazed carrots prepared from canned. Excluded baby food.	Solids = 66% ("Food Yields," Table 1, Item 487, Carrots: Contents of can: Wet pack: All samples) Assumed 15% of NFS consumption is canned.
Vegetables—Canned	Canned sweet corn	Included regular, cream style, and fiesta style canned corn. Excluded baby corn. Included half of corn mixtures with one other vegetable. In consumption data, included creamed corn. Excluded baby food.	Solids = 68% ("Food Yields," Table 1, Item 922, Corn: Canned, whole grain, contents of can: Wet pack: All samples) Assumed 15% of NFS consumption is canned.
Vegetables—Canned	Canned cucumbers (pickles)	Included all varieties of cucumber pickles. Excluded cucumber salad. Included half of cucumber mixtures with one other vegetable.	Solids = 54% (Average of 3 products) Solids = 62% (Pickles: Midgets: Direct measurement) Solids = 47% (Pickles: Slices: Direct measurement) Solids = 53% (Pickles: Baby dills: Direct measurement) For count data, assumed 1 pickle = 65 g.
Vegetables—Canned	Canned green peas	Included regular and creamed canned peas. Included half of green pea mixtures with one other vegetable. Excluded snow peas, sugar snap peas, blackeye peas, and pea soup. Excluded canned soup and baby food.	Solids = 64% ("Food Yields," Table 1, Item 1756, Peas, Green: Canned, contents of can: Wet pack: No. 303) Assumed 42% of NFS consumption is canned.
Vegetables—Canned	Canned chile peppers	Included regular and pickled chile peppers.	Solids = 45% (Direct measurement) Assumed 100% of NFS consumption is canned.
Vegetables—Canned	Canned tomatoes	Included chopped and whole canned tomatoes, puree, paste, and sauce (with and without meat). Included pickled tomatoes. Included half of tomato mixtures with one other vegetable. Excluded tomato soup.	Solids = 66% ("Food Yields," Table 1, Item 2545, Tomatoes: Canned, contents of can: No. 303) Assumed 78% of NFS consumption is canned.
Vegetables—Canned	Canned mushrooms	Included canned regular and pickled mushrooms. Excluded canned mushroom salads, dried mushrooms, and frozen mushroom hor d'oeuvres. Excluded mushroom soup.	Solids = 58% ("Food Yields," Table 1, Item 1512, Mushrooms: Canned, contents of can, all samples)
Vegetables—Canned	Canned potatoes	Included all varieties of canned potatoes. Split canned mixed vegetables with potatoes and one other primary ingredient. Excluded shelf-stable potato side dishes, canned potato salad, and canned potato soup.	Solids = 68% ("Food Yields," Table 1, Item 2091, Potato and potato products: Canned, contents of can: All sizes)
Vegetables—Canned	Other canned vegetables	Skipped because infeasible to align purchase and consumption categories.	
Vegetables—Frozen	Frozen asparagus	[For all frozen vegetables, excluded blends and medleys because other contents are not known.] Included cut and whole spears. Included stir-fry asparagus. Excluded mixtures.	
Vegetables—Frozen	Frozen snap beans	Included green beans, wax beans, and French beans. Included mixtures with one vegetable (split).	Assumed 26% of NFS consumption is frozen.

Continued—

Table A-1

Food Category Descriptions and Values Used for Count Data Conversion, Inedible and Solids Percentages, and Density Estimates—continued

Category	Food	Description	Food-specific adjustment values (and NDB number If available)[a]
Vegetables—Frozen	Frozen broccoli	Included cut plain broccoli and broccoli, with or without sauce. Split broccoli mixtures with one other vegetable. Excluded broccoli rabe.	Assumed 31% of NFS consumption is frozen.
Vegetables—Frozen	Frozen carrots	Included cut and whole carrots, with or without sauce. Split carrot mixtures with one other vegetable.	Assumed 11% of NFS consumption is frozen.
Vegetables—Frozen	Frozen cauliflower	Included cut plain cauliflower, with or without sauce. Split cauliflower mixtures with one other vegetable.	Assumed 20% of NFS consumption is frozen.
Vegetables—Frozen	Frozen sweet corn	Included corn on the cob and cut corn. Split corn mixtures with one other vegetable. Included fiesta corn (mixture of corn and sweet peppers).	For corn on the cob, calculated edible percentage of 55%. Assumed 34% of NFS consumption is frozen.
Vegetables—Frozen	Frozen green peas	Included green peas, cream peas, early June peas, garden peas, green and yellow split pea, purple hull pea, all with or without sauce. Excluded pea pods. Split pea mixtures with one other vegetable.	Assumed 58% of NFS consumption is frozen.
Vegetables—Frozen	Frozen lima beans	Included lima beans, with or without sauce. Split lima bean mixtures with one other vegetable.	
Vegetables—Frozen	Frozen spinach	Included spinach leaf, with or without sauce. Split spinach mixtures with one other vegetable.	Assumed 31% of NFS consumption is frozen.
Vegetables—Frozen	Frozen potatoes	Included frozen hash browns, fries, and wedges. Excluded whole frozen baked potatoes because not included in consumption data and other frozen potato side dishes.	For count data, assumed 1 lb. boxes.
Vegetables—Frozen	Other frozen vegetables	Skipped because difficult to align consumption categories with purchase categories.	
Vegetables—Dried	Dehydrated onions	Skipped because consumption data are not available.	
Vegetables—Dried	Dehydrated potatoes	Consumption data includes reconstituted mashed potatoes made with milk, fat, and/or egg.	Prepared weight conversion = 6.28 (71501090—White potato, from dry, mashed, made with milk, no fat)
Vegetables—Dried	Potato chips and shoestring potatoes	Included potato chips, potato crisps, and potato snacks (e.g., crunchies, fries, sticks). Includes fat free, reduced fat, regular, unsalted, and salted. Excluded sweet potato chips. Excluded combination variety packs.	

Continued—

Table A-1

Food Category Descriptions and Values Used for Count Data Conversion, Inedible and Solids Percentages, and Density Estimates—continued

Category	Food	Description	Food-specific adjustment values (and NDB number If available)[a]
Vegetables—Dried	Dry edible beans	Included all dry bean categories (e.g., black, pinto, pink, lima, navy, white, cowpeas, chickpeas, kidney). Converted to prepared weight. Prepared with or without fat.	Prepared weight conversion = 2.35 (average of black, lima, navy, chickpea, kidney, pinto) Prepared weight conversion = 2.29 (41102020—Black, brown, or Bayo beans, dry, cooked, fat not added in cooking) Prepared weight conversion = 2.50 (41103020—Lima beans, dry, cooked, fat not added in cooking) Prepared weight conversion = 2.40 (41101120—White beans, dry, cooked, fat not added in cooking) Prepared weight conversion = 2.12 (41302020—Chickpeas, dry, cooked, fat not added in cooking) Prepared weight conversion = 2.40 (41106020—Red kidney beans, dry, cooked, fat not added in cooking) Prepared weight conversion = 2.40 (41104020—Pinto, calico, or red Mexican beans, dry, cooked, fat not added in cooking)
Grains	White and whole wheat flour	Skipped because consumption data are not available.	
Grains	Durum flour	Skipped because consumption data are not available.	
Grains	Rice	Included white, brown, basmati, jasmine, and other types. Included plain and mixes. Included wild rice because difficult to separate out in many mixes. Converted regular rice and instant rice to prepared weight. Prepared with or without fat. Excluded rice cakes, rice cereals, and rice flour.	Prepared weight conversion = 3.07 (56205010—Rice, white, cooked, regular, fat not added in cooking)
Grains	Rye flour	Skipped because consumption data are not available.	
Grains	Corn flour and meal	Skipped because consumption data are not available.	
Grains	Corn hominy and grits	Included dry hominy grits. Prepared with or without fat or cheese.	Prepared weight conversion = 6.56 (56201010—Grits, cooked, corn or hominy, regular, fat not added in cooking)
Grains	Corn starch	Skipped because consumption data are not available.	
Grains	Barley products	Included dry barley and hot barley cereals (including barley bran). Included half of hot cereals with barley and oats. Excluded barley flour and ready to eat cereals with barley. Prepared with or without fat.	Prepared weight conversion = 3.77 (56200400—Barley, cooked, fat not added in cooking)
Grains	Oat products	Included hot cereals with oats, oat flakes, oatmeal, and oat bran including regular, quick, and instant. Split hot cereals with oats and one other primary ingredients. Excluded ready-to-eat cereals with oats (many other ingredients) and groats unless oat groats. Prepared with or without fat.	Prepared weight conversion = 5.78 (56203000—Oatmeal, cooked, NS as to regular, quick or instant, fat not added in cooking)

Continued—

Table A-1

Food Category Descriptions and Values Used for Count Data Conversion, Inedible and Solids Percentages, and Density Estimates—continued

Category	Food	Description	Food-specific adjustment values (and NDB number If available)[a]
Added sugars and sweeteners	Cane and beet sugar	Included brown, powdered, raw, and granulated sugars. Excluded sugar syrups. (Deleted 5 count records because could not determine size.)	
Added sugars and sweeteners	High-fructose corn syrup	Skipped because consumption data are not available.	
Added sugars and sweeteners	Glucose	Skipped because consumption data are not available.	
Added sugars and sweeteners	Dextrose	Skipped because consumption data are not available.	
Added sugars and sweeteners	Honey	Included all products in the honey product module of the purchase data, including plain and flavored varieties and honey spreads.	
Added sugars and sweeteners	Edible syrups	Included sugar, maple, pancake, sorghum, and corn syrups, and molasses. Excluded toppings (e.g., chocolate, butterscotch) and berry/fruit syrups. Deleted 2 count records; could not determine size.	Density = 330 g/8 fluid oz = 1.4551 weight oz/fluid oz (19355—Syrups, sorghum) Density = 315 g/8 fluid oz = 1.3889 weight oz/fluid oz (19360—Syrups, table blends, pancake, with 2% maple) Density = 337.16 g/8 fluid oz = 1.4866 weight oz/fluid oz (19304—Molasses)

Notes:
UPC: universal product code on prepackaged foods.
Random weight: foods packaged and weighed at the store.
NFS = not further specified.
NDB=Nutrient Databank.
NS = not specified.
[a]Note that in cases where percentage of solids is indicated, the inedible percentage is calculated as 100% minus the solids percentage.

Source: Compiled by RTI International.

Table A-2

Weight and Inedible Percentage Assumptions for Fruit and Vegetable Count Data

Food description	NDB_No	Amount	Additional description	Weight (g)	Inedible description	Inedible (%)
Vegetables and Vegetable Products						
Artichokes, (globe or french), raw	11007	1	Artichoke, medium	128	Stem and inedible parts of bracts and flowers	60
Asparagus, raw	11011	1	Spear, medium (5¼″ to 7″ long) (assumed 36 spears in a bunch)	16	Butt ends	47
Broccoli, raw	11090	1	Bunch	608	Leaves and tough stalks with trimmings	39
brussels sprouts, raw	11098	1	Sprout (assumed 37 sprouts in a pound)	19	Outer leaves	10
Cabbage, raw	11109	1	Head, medium (about 5¾″ diameter)	908	Outer leaves and core	20
Carrots, raw	11124	1	Medium (assumed 5 carrots in a bunch)	61	Crown, tops and scrapings	11
Cauliflower, raw	11135	1	Head, medium (5″ to 6″ diameter)	575	Leaf stalks, cores and trimmings	61
Celery, raw	11143	1	Stalk, medium (7½″ to 8″ long) (assumed 8 stalks in a bunch)	40	Roots and trimmings	11
Corn, sweet, yellow, raw	11167	1	Ear, medium (6¾″ to 7½″ long) yields	90	35% husk, silk, trimmings; 29% cob	64
Cucumber, peeled, raw	11206	1	Medium	201	Parings, ends and bruised spots	27
Eggplant, raw	11209	1	Eggplant, unpeeled (approx 1¼ lb)	548	Ends, parings and trimmings	19
Endive, raw	11213	1	Head	513	Outer leaves and core	14
Garlic, raw	11215	1	Clove (assumed 13 cloves in a head)	3	Knob and skin	13
Lettuce, iceberg (includes crisp head types), raw	11252	1	Head, medium (6″ diameter)	539	Core	5
Mushrooms, portabella, raw	11265	1	Piece whole	84	Trimmings	3
Mushrooms, white, raw	11260	1	Medium	18	Trimmings	3
Onions, raw	11282	1	Medium (2½″ diameter)	110	Stem ends, sprouts and defects	10
Peppers, sweet, green, raw	11333	1	Medium (approx 2¾″ long, 2½″ diameter)	119	Stem ends, seeds and core	18
Potato, flesh and skin, raw	11352	1	Potato medium (2¼″ to 3¼″ diameter)	213	Parings and trimmings	25
Radishes, raw	11429	1	Medium (¾″ to 1″ diameter) (assumed 10 radishes in a bunch)	4.5	Stem ends, rootlets and trimmings	10

Continued—

Table A-2

Weight and Inedible Percentage Assumptions for Fruit and Vegetable Count Data—continued

Food description	NDB_No	Amount	Additional description	Weight (g)	Inedible description	Inedible (%)
Vegetables and Vegetable Products—continued						
Spinach, raw	11457	1	Bunch	340	Large stems and roots	28
Squash, summer, all varieties, raw	11641	1	Medium	196	Ends	5
Sweet potato, raw, unprepared	11507	1	Sweet potato, 5″ long	130	Parings and trimmings	28
Tomatoes, red, ripe, raw, year round average	11529	1	Medium whole (2 3/5″ diameter)	123	Core and stem ends	9
Fruits and Fruit Juices						
Apples, raw, with skin	09003	1	Medium (3″ diameter)	182	Core and stem	10
Apricots, raw	09021	1	Apricot	35	Pits	7
Avocados, raw, all commercial varieties	09037	1	Avocado, NS as to Florida or California	201	Seed and skin	26
Bananas, raw	09040	1	Medium (7″ to 7 7/8″ long) (assumed 7 bananas in a bunch)	118	Skin	36
Figs, raw	09089	1	Medium (2¼″ diameter)	50	Stems	1
Grapefruit, raw, pink and red and white, all areas	09111	0.5	Medium (approx 4″ diameter)	128	Peel, seeds, core, and membrane	50
Kiwifruit, (Chinese gooseberries), held in storage, raw	09405	1	Fruit without skin, large	91	Skin	14
Kiwifruit, (Chinese gooseberries), held in storage, raw	09405	1	Fruit without skin, medium	76	Skin	14
Kiwifruit, (Chinese gooseberries), held in storage, raw	09405	1	Average	83.5	Skin	14
Lemons, raw, without peel	09150	1	Fruit (2 1/8″ diameter)	58	45% peel, 2% seeds	47
Lemons, raw, without peel	09150	1	Fruit (2 3/8″ diameter)	84	45% peel, 2% seeds	47
Lemons, raw, without peel	09150	1	Average	71	45% peel, 2% seeds	47
Limes, raw	09159	1	Fruit (2″ diameter)	67	Peel and seeds	16
Mangos, raw	09176	1	Fruit without refuse	207	Seeds and skin	31
Melons, cantaloupe, raw	09181	1	Melon, medium (about 5″ diameter)	552	9% cavity contents, 1% cutting loss, 39% rind	49
Melons, honeydew, raw	09184	1	Melon (5¼″ diameter)	1000	5% cavity contents, rind 49%	54

Continued—

Table A-2

Weight and Inedible Percentage Assumptions for Fruit and Vegetable Count Data—continued

Food description	NDB_No	Amount	Additional description	Weight (g)	Inedible description	Inedible (%)
Fruits and Fruit Juices —continued						
Melons, honeydew, raw	09184	1	Melon (6″ to 7″ diameter)	1280	5% cavity contents, rind 49%	54
Melons, honeydew, raw	09184	1	Average	1140	5% cavity contents, rind 49%	54
Oranges, raw, all commercial varieties	09200	1	Fruit (2 5/8″ diameter)	131	Peel and seeds	27
Papayas, raw	09226	1	Medium (51/8″ long x 3″ diameter)	304	Seeds and skin	33
Peaches, raw	09236	1	Medium (2 5/8″ diameter)	150	Pit	4
Pears, raw	09252	1	Medium	178	Stem, core and seeds	10
Pineapple, raw, all varieties	09266	1	Fruit	905	8% core, 16% crown, 26% parings	49
Plums, raw	09279	1	Fruit (2 1/8″ diameter)	66	Pits	6
Strawberries, raw	09316	1	Medium (1¼″ diameter) (assumed 27 strawberries in a basket)	12	Caps and stems	6
Tangerines (mandarin oranges), raw	09218	1	Medium (2½″ diameter)	88	Peel and seeds	26
Watermelon, raw	09326	1	Melon (15″ long x 7½″ diameter)	4518	Rind, seeds, and cutting loss	48

NS = not specified.

Source: U.S. Department of Agriculture, Agricultural Research Service. 2007. USDA National Nutrient Database for Standard Reference, Release 20. www.ars.usda.gov/ba/bhnrc/ndl.

Table A-3

Edible Solids Percentages for Canned Foods and Moisture Gain Percentages for Dry Foods

	Direct measurements				USDA/ARS (1975)				
Food	Beginning weight	Ending weight	% Solids	% Gain	% Solids	1-oz dry, yield (g)	% Gain	Item no.	Item Description
Canned apples and applesauce	417	309	74		87			52	Apples—Canned, contents of can: Sliced, unspecified
Canned apricots—Syrup	432	245	57		59			74	Apricots: Canned, contents of can: Halves: All samples in syrup or water
Canned cherries—Syrup	437	305	70		69			533	Cherries: Canned, contents of can: Sour, red pitted: All samples
Canned cherries—Water	365	270	74						
Average for canned cherries			72						
Canned peaches—Syrup	432	301	70		60			1666	Peaches: Canned, contents of can: All samples
Canned peaches—Juice	417	282	68						
Average for canned peaches			69						
Canned pears—Syrup	425	190	45		59			1735	Pears: Canned, contents of can (halves): All samples
Canned pears—Juice	424	237	56						
Average for canned pears			50						
Canned pineapple—Syrup	452	284	63		65			1843	Pineapple: Canned, contents of can: All samples, all styles
Canned pineapple—Juice	564	374	66						
Average for canned pineapple			65						
Canned plums—Syrup	440	282	64		56			1886	Plums: Canned, contents of can: All samples
Canned olives—Pits	361	218	48		63			1560	Olives: Green, contents of can, unspecified size: Plain: Unpitted
Canned olives—Stuffed	266	165	62		64			1562	Olives: Green, contents of can, unspecified size: Plain: Stuffed
Average for canned olives			55		57				

Continued—

Table A-3

Edible Solids Percentages for Canned Foods and Moisture Gain Percentages for Dry Foods—continued

	Direct measurements				USDA/ARS (1975)				
Food	Beginning weight	Ending weight	% Solids	% Gain	% Solids	1-oz dry, yield (g)	% Gain	Item no.	Item Description
Canned asparagus	428	245	57		60			103	Asparagus: Canned, contents of can: All samples, cut spears, spears, or tips, all can sizes
Canned snap beans (green beans)	421	230	55		58			206	Beans: Snap, green, and wax: Canned, contents of can: All samples, including unspecified
Canned cabbage (sauerkraut)	435	273	63		88			2272	Sauerkraut: Canned, contents of can: All samples
Canned carrots	435	261	60		66			487	Carrots: Canned, contents of can: Wet pack: All samples
Canned chile peppers	216	97	45						
Canned cucumbers (pickles—midgets)	409	253	62						
Canned cucumbers (pickles—slices)	492	232	47						
Canned cucumbers (pickles—baby dills)	744	396	53						
Average for canned cucumbers			54						
Canned green peas	421	264	63		64			1756	Peas, Green: Canned, contents of can: Wet pack: No. 303
Canned mushrooms	383	206	54		58			1512	Mushrooms: Canned, contents of can, all samples
Canned potatoes	431	238	55		68			2091	Potato and Potato Products: Canned, contents of can: All sizes
Canned sweet corn	429	265	62		68			922	Corn: Canned, whole grain, contents of can: Wet pack: All samples
Canned sweet potatoes	455	269	59		65			2507	Sweet Potatoes: Canned, contents of can: Syrup pack: All samples
Canned tomatoes	412	295	72		66			2545	Tomatoes: Canned, contents of can: No. 303

Continued—

Table A-3

Edible Solids Percentages for Canned Foods and Moisture Gain Percentages for Dry Foods—continued

	Direct measurements				USDA/ARS (1975)				
Food	Beginning weight	Ending weight	% Solids	% Gain	% Solids	1-oz dry, yield (g)	% Gain	Item no.	Item Description
Canned zucchini	392	277	71		61			2453	Squash, Summer: Canned, yellow, cut, contents of can, all samples
Canned clams	185	63	34		45			880	Clams: Canned, minced or chopped, contents of can
Canned salmon	411	328	80		81			2242	Salmon: Canned: Contents of can: All samples
Canned tuna—Oil	164	132	80		82			2575	Tuna: Canned, contents of can: Solid pack, in oil
Canned tuna—Water	169	135	80		79			2571	Tuna: Canned, contents of can: Chunks: In brine
Crabmeat	188	118	63		77			962	Crab: Meat, canned
Oysters	247	134	54						Not contained in "Food Yields" document (used direct measurement)
Salmon in pouch	199	197	99						
Sardines—Oil	130	111	85		87			2258	Sardines: Canned: Atlantic
Sardines—Water	115	86	75						
Shrimp	202	129	64						Not contained in "Food Yields" document (used direct measurement)
Smoked salmon in pouch	98	87	89						
Tuna in pouch	82	79	96		94			2573	Tuna: Canned, contents of can: Flakes, in oil
Barley products	210	618		294		107	377	56200400	Barley, cooked, fat not added in cooking
Dehydrated sweet potatoes	98	373		381					
Dehydrated white potatoes	77	377		490		178	628	71501090	White potato, from dry, mashed, made with milk, no fat
Dehydrated white potatoes—Pouch	108	504		467					

Continued—

Table A-3

Edible Solids Percentages for Canned Foods and Moisture Gain Percentages for Dry Foods—continued

	Direct measurements				USDA/ARS (1975)				
Food	Beginning weight	Ending weight	% Solids	% Gain	% Solids	1-oz dry, yield (g)	% Gain	Item no.	Item Description
Dry edible beans:									
Black	195	383		196		65	229	41102020	Black, brown, or Bayo beans, dry, cooked, fat not added in cooking
Lima	205	432		211		71	250	41103020	Lima beans, dry, cooked, fat not added in cooking
Navy	184	354		192		68	240	41101120	White beans, dry, cooked, fat not added in cooking
Chickpeas	190	395		208		60	212	41302020	Chickpeas, dry, cooked, fat not added in cooking
Kidney	185	388		210		68	240	41106020	Red kidney beans, dry, cooked, fat not added in cooking
Pinto	191	391		205		68	240	41104020	Pinto, calico, or red Mexican beans, dry, cooked, fat not added in cooking
Average for dry edible beans				204			235		
Grits	47	184		391		186	656	56201010	Grits, cooked, corn or hominy, regular, fat not added in cooking
Oat products	45	187		416		164	578	56203000	Oatmeal, cooked, NS as to regular, quick or instant, fat not added in cooking
Rice	210	1,080		514		87	307	56205010	Rice, white, cooked, regular, fat not added in cooking

NS = not specified.

Source: U.S. Department of Agriculture, Agricultural Research Service. 1975. *Food Yields Summarized by Different Stages of Preparation Handbook*. Agriculture Handbook No. 102.

Appendix B:

Detailed Food Loss Calculations

The tables in this appendix provide details of the food loss calculations and proposed food loss estimates for each food. The fields in each table are as follows:

- **ERS Availability**: Total pounds of each food available for consumption at the consumer level in 2004. Average values were obtained from the column "Loss at consumer level: Other (cooking loss and uneaten food)" of the Loss-Adjusted Food Availability tables (USDA/ERS, 2008) and multiplied by the 2004 U.S. population (292,303,000).

- **NHANES Consumption**
  - **Total:** Total annual pounds of each food consumed by individuals at home or at away-from-home locations in 2003–2004. Average weighted daily consumption was obtained from NHANES and multiplied by the 2004 population and 365 days.
  - **Store-only:** Total annual pounds of each food consumed by individuals from food purchased in stores (at-home consumption) in 2003–2004.

- **Nielsen Purchases**
  - **All Purchases**: Total pounds of each food purchased in 2004 including UPC and random-weight items.
  - **Random Weight Only:** Total pounds of each random-weight item purchased in 2004.

- **Nielsen + Perishables**
  - **Perishables Group—Non-UPC:** Total pounds of each random-weight food purchased in 2004, if available from Perishables Group, Inc.
  - **All Purchases—Nielsen UPC + Perishables Non-UPC:** Total pounds of each food purchased in 2004 using Nielsen UPC data and Perishables non-UPC data. If estimates are not available from Perishables Group, Inc., the column was left blank.

- **Previous Consumer Loss:** Consumer-level loss conversion factor estimate available in the Loss-Adjusted Food Availability tables in early 2008 (USDA/ERS, 2008).

- **Expert Average Consumer Loss:** Average of six experts' (five external experts and one ERS expert) consumer-level loss conversion factor subjective estimates.

- **Consumer Loss (Unadjusted for Ingredient Use):** Calculated consumer-level food loss conversion factors, without adjustments for use of the food as an ingredient, using the following:

  - **Nielsen Data:** Percentage loss when comparing Nielsen UPC and non-UPC estimates to NHANES store-only estimates.
  - **Nielsen + Perishables Data:** Percentage loss when comparing Nielsen UPC and Perishables non-UPC (when available) to NHANES store-only estimates.
  - **Availability Data:** Percentage loss when comparing ERS availability data to NHANES total estimates.

- **Ingredient Use: Expert Average:** Average of six experts' (five external experts and one ERS expert) ingredient use percentage subjective estimates.

- **Consumer Loss (Adjusted for Ingredient Use):**[1] Calculated consumer-level food loss conversion factors, subtracting adjustments for use of the food as an ingredient, using
  - **Nielsen Data:** Percentage loss when comparing Nielsen UPC and non-UPC estimates to NHANES store-only estimates (ingredient percentage subtracted);
  - **Nielsen + Perishables Data:** Percentage loss when comparing Nielsen UPC and Perishables non-UPC (when available) to NHANES store-only estimates (ingredient percentage subtracted); and
  - **Availability Data:** Percentage loss when comparing ERS availability data to NHANES total estimates (ingredient percentage subtracted).

- **Proposed Consumer Loss Estimate:** Proposed estimate to be used as the revised consumer-level food loss conversion factor.

- **Explanation:** Source of the proposed estimate or explanation for missing values.

[1]In making the adjustment for ingredient use, we are assuming that consumer-level food loss for each food is similar regardless of whether the food is consumed directly or consumed as an ingredient of another food.

Table B-1

Food Purchases, Consumption, and Consumer Loss Estimates: Meat, Poultry, Fish, Eggs, and Nuts

			NHANES consumption		Nielsen purchases		Nielsen + Perishables	
Category	Food	ERS availability[a]	Total (lbs)	Store only (lbs)	All purchases (lbs)	Random-weight only (lbs)	Perishables Group: Non-UPC (lbs)	All purchases: Nielsen UPC + Perishables non-UPC (lbs)
Meat, poultry, and fish	Beef	17,099,725,500	5,151,042,898	2,840,731,654	3,558,386,959	3,069,885,425	2,491,657,873	2,980,159,407
Meat, poultry, and fish	Veal	116,921,200	89,442,139	53,748,878	18,388,988	18,150,438	15,102,272	15,340,821
Meat, poultry, and fish	Pork	13,007,483,500	1,880,355,501	1,349,752,566	1,905,387,472	1,860,337,502	969,439,793	1,014,489,764
Meat, poultry, and fish	Lamb	233,842,400	117,626,006	52,513,542	39,615,056	39,608,731	34,268,281	34,274,615
Meat, poultry, and fish	Chicken	16,105,895,300	4,512,754,037	2,344,695,077	2,748,180,707	2,077,261,524	2,102,899,441	2,773,818,624
Meat, poultry, and fish	Turkey	3,653,787,500	678,946,988	490,114,867	841,938,540	724,389,447	641,777,488	759,326,581
Meat, poultry, and fish	Fresh and frozen fish	1,490,745,300	1,921,188,390	1,056,529,846	437,326,432	149,665,050	211,845,974	499,507,356
Meat, poultry, and fish	Fresh and frozen shellfish	1,695,357,400	596,108,910	226,507,282	222,953,799	55,329,928	211,350,220	378,974,091
Meat, poultry, and fish	Canned salmon	87,690,900	70,922,683	67,358,979	81,556,870			
Meat, poultry, and fish	Canned sardines[b]	29,230,300	12,005,716	12,005,716	18,876,934			
Meat, poultry, and fish	Canned tuna	906,139,300	959,062,962	795,661,781	425,009,882			
Meat, poultry, and fish	Canned shellfish[b]	116,921,200	2,591,336	2,591,336	18,928,152			
Meat, poultry, and fish	Other canned fish[b]	116,921,200	9,371,572	9,155,176	19,051,627			
Meat, poultry, and fish	Cured fish	87,690,900	21,383,403	16,213,668				
Eggs	Eggs	8,568,131,688	4,456,117,455	3,278,097,296	2,733,603,127			
Nuts	Peanuts, snack peanuts, other peanuts	2,250,733,100	393,270,826	288,997,598	337,869,743	32,049,359		
Nuts	Peanut butter	876,909,000	591,376,670	570,875,078	676,671,639			
Nuts	Almonds	233,842,400	68,929,022	65,981,574	69,045,570	7,725,652		
Nuts	Hazelnuts (filberts)[b]	29,230,300	2,285,560	0	4,995,791	4,351,336		
Nuts	Pecans	146,151,500	20,007,410	13,965,742	50,840,798	13,523,607		
Nuts	Walnuts	146,151,500	45,614,995	42,534,181	66,844,110	7,793,549		
Nuts	Macadamia nuts[b]	29,230,300	7,200,325	7,200,325	4,578,727	551,573		
Nuts	Pistachio nuts	58,460,600	25,957,110	24,881,719	63,890,630	10,244,546		
Nuts	Other tree nuts	292,303,000	212,319,970	190,146,018	248,768,298	7,429,995		
Nuts	Coconut[b]	146,151,500	1,598,269	1,497,363	18,699,543			

Continued—

Table B-1

Food Purchases, Consumption, and Consumer Loss Estimates: Meat, Poultry, Fish, Eggs, and Nuts—continued

Category	Food	Previous consumer loss estimate	Expert average consumer loss	Consumer loss (unadjusted for ingredient percentage)			Ingredient use: Expert average	Consumer loss (adjusted for ingredient percentage)			Proposed consumer loss estimate	Explanation
				Nielsen data	Nielsen + Perishables data	Availability data		Nielsen data	Nielsen + Perishables data	Availability data		
Meat, poultry, and fish	Beef	32%	12%	20%	5%	70%	20%	0%	–15%	50%	20%	Estimate based on Nielsen (assumed use as an ingredient reflected in NHANES)
Meat, poultry, and fish	Veal	35%	13%	–192%	–250%	24%	15%	–207%	–265%	9%	20%	Assumed same value as beef
Meat, poultry, and fish	Pork	39%	21%	29%	–33%	86%	20%	9%	–53%	66%	29%	Estimate based on Nielsen (assume duse as an ingredient reflected in NHANES)
Meat, poultry, and fish	Lamb	36%	26%	–33%	–53%	50%	10%	–43%	–63%	40%	20%	Assumed same value as beef
Meat, poultry, and fish	Chicken	40%	16%	15%	15%	72%	25%	–14%	–10%	47%	15%	Estimate based on Nielsen or Nielsen+Perishables (assumed use as an ingredient reflected in NHANES)
Meat, poultry, and fish	Turkey	32%	28%	42%	35%	81%	20%	22%	15%	61%	35%	Estimate based on Nielsen+Perishables (assumed use as an ingredient reflected in NHANES)
Meat, poultry, and fish	Fresh and frozen fish	33%	33%	–142%	–112%	–29%	20%	–162%	–132%	–49%	40%	Assumed same value as fresh and frozen shellfish
Meat, poultry, and fish	Fresh and frozen shellfish	33%	35%	–2%	40%	65%	30%	–32%	10%	35%	40%	Estimate based on Nielsen+Perishables (assumed use as an ingredient reflected in NHANES)
Meat, poultry, and fish	Canned salmon	10%	12%	17%		19%	45%	–28%		–26%	17%	Estimate based on Nielsen (assumed used as an ingredient reflected in NHANES)
Meat, poultry, and fish	Canned sardines[b]	10%	9%	36%		59%	10%	26%		49%	36%	Estimate based on Nielsen (assumed used as an ingredient reflected in NHANES)
Meat, poultry, and fish	Canned tuna	10%	9%	–87%		–6%	45%	–132%		–51%	17%	Assumed same value as canned salmon

Continued—

Table B-1

Food Purchases, Consumption, and Consumer Loss Estimates: Meat, Poultry, Fish, Eggs, and Nuts—continued

Category	Food	Previous consumer loss estimate	Expert average consumer loss	Consumer loss (unadjusted for ingredient percentage)			Ingredient use: expert average	Consumer loss (adjusted for ingredient percentage)			Proposed consumer loss estimate	Explanation
				Nielsen data	Nielsen + Perishables data	Availability data		Nielsen data	Nielsen + Perishables data	Availability data		
Meat, poultry, and fish	Canned shellfish[b]	10%	14%	86%		98%	10%	76%		88%	17%	Assumed same value as canned salmon
Meat, poultry, and fish	Other canned fish[b]	10%	14%	52%		92%	45%	7%		47%	17%	Assumed same value as canned salmon
Meat, poultry, and fish	Cured fish	10%	13%	NC		76%	15%	NC		61%	17%	Assumed same value as canned salmon
Eggs	Eggs	15%	12%	–20%		48%	25%	–45%		23%	23%	Estimate based on Availability adjusted for ingredient use
Nuts	Peanuts, snack peanuts, other peanuts	10%	8%	14%		83%	10%	4%		73%	4%	Estimate based on Nielsen data
Nuts	Peanut butter	10%	12%	16%		33%	10%	6%		23%	14%	Estimate based on average of Nielsen and Availability data
Nuts	Almonds	10%	9%	4%		71%	50%	–46%		21%	21%	Estimate based on Availability data
Nuts	Hazelnuts (filberts)[b]	10%	11%	NC		92%	72%	NC		20%	20%	Estimate based on Availability data
Nuts	Pecans	10%	9%	73%		86%	73%	0%		14%	14%	Estimate based on Availability data
Nuts	Walnuts	10%	9%	36%		69%	69%	–32%		0%	18%	Estimate based on average of other tree nuts (almonds, hazelnuts, and pecans)
Nuts	Macadamia nuts[b]	10%	9%	–57%		75%	68%	–125%		8%	8%	Estimate based on Availability data
Nuts	Pistachio nuts	10%	10%	61%		56%	43%	19%		13%	16%	Estimate based on average of Nielsen and Availability data
Nuts	Other tree nuts	10%	12%	24%		27%	53%	–29%		–25%	18%	Estimate based on average of tree nuts (almonds, hazelnuts, and pecans)
Nuts	Coconut[b]	10%	13%	92%		99%	85%	7%		14%	10%	Estimate based on average of Nielsen and Availability data

Note: Consumer-level loss estimates should be positive. Negative consumer-level loss estimates indicate reported consumption exceeds food purchases.

NC = not calculated.

TBD = to be decided; reasonable estimate might be calculable if ingredient percentage is revised.

[a]"ERS Availability" refers to the volume of each food available at the consumer level in the Food Availability data series. The definition of these foods may differ somewhat from how we defined them when obtaining consumption data from NHANES.

[b]Food has 10 or fewer consumption observations in NHANES; thus, the total consumption estimate may not be reliable.

Table B-2

Food Purchases, Consumption, and Consumer Loss Estimates: Dairy Products

Category	Food	ERS availability[a]	NHANES consumption		Nielsen purchases		Nielsen + Perishables	
			Total (lbs)	Store only (lbs)	All purchases (lbs)	Random-weight only (lbs)	Perishables Group: non-UPC (lbs)	All purchases: Nielsen UPC + Perishables non-UPC (lbs)
Dairy—Beverages	Plain whole milk	15,375,137,800	13,855,521,430	12,605,738,409	6,316,577,578	3,069,885,425	2,491,657,873	2,980,159,407
Dairy—Beverages	Plain 1% and 2% milk	20,695,052,400	21,708,995,268	20,484,626,252	15,162,626,951	18,150,438	15,102,272	15,340,821
Dairy—Beverages	Skim milk	6,839,890,200	6,672,780,489	6,484,848,527	6,155,687,797	1,860,337,502	969,439,793	1,014,489,764
Dairy—Beverages	Whole flavored milk	759,987,800	1,632,080,243	748,523,315	166,717,539	39,608,731	34,268,281	34,274,615
Dairy—Beverages	Low-fat flavored milk	3,010,720,900	1,646,289,194	720,388,372	648,883,677	2,077,261,524	2,102,899,441	2,773,818,624
Dairy—Beverages	Buttermilk	467,684,800	120,280,615	98,971,538	202,653,811	724,389,447	641,777,488	759,326,581
Dairy—Beverages	Light cream, heavy cream, half & half	2,016,890,700	594,545,923	449,178,249	533,050,634	149,665,050	211,845,974	499,507,356
Dairy—Beverages	Eggnog	29,230,300	93,232,353	83,427,050	171,276,676			
Dairy—Other	Sour cream	1,081,521,100	276,990,470	143,582,176	383,172,700			
Dairy—Other	Cream cheese	584,606,000	153,022,194	124,761,883	292,626,749	1,262,353		
Dairy—Other	Cheddar cheese	2,806,108,800	875,907,112	603,385,679	422,110,568	62,264,074		
Dairy—Other	Other American cheese	730,757,500	149,021,230	140,478,312	160,513,973	44,880,389		
Dairy—Other	Provolone cheese	277,687,850	92,282,801	30,474,131	49,123,091	30,979,964		
Dairy—Other	Parme-san and Romano cheese	198,766,040	50,116,492	34,078,292	84,355,790	12,770,892		
Dairy—Other	Mozzarel-la cheese	2,727,186,990	234,487,337	178,029,046	194,297,701	13,455,390		
Dairy—Other	Ricotta cheese[b]	227,996,340	18,314,351	18,314,351	83,195,210	831,345		
Dairy—Other	Other Italian cheese[b]	108,152,110						
Dairy—Other	Swiss cheese	3,799,939,000	262,519,962	195,951,533	114,940,444	63,506,395		
Dairy—Other	Brick cheese	8,769,090	3,466,327	3,466,327	247,013			
Dairy—Other	Muenster cheese	67,229,690	23,218,766	22,899,818	30,757,518	18,680,763		
Dairy—Other	Blue cheese	55,537,570	12,896,701	9,233,502	3,377,589	2,352,092		

Continued—

Table B-2

Food Purchases, Consumption, and Consumer Loss Estimates: Dairy Products

Category	Food	ERS availability[a]	NHANES consumption		Nielsen purchases		Nielsen + Perishables	
			Total (lbs)	Store only (lbs)	All purchases (lbs)	Random-weight only (lbs)	Perishables Group: non-UPC (lbs)	All purchases: Nielsen UPC + Perishables non-UPC (lbs)
Dairy—Other	Other miscellaneous cheese[b]	371,224,810	10,011,350	8,222,088	9,843,604	6,713,728		
Dairy—Other	Processed cheese	1,134,135,640	929,762,071	733,399,387	793,224,636	87,417,481		
Dairy—Other	Processed cheese foods and spreads	976,292,020	152,424,049	124,185,142	95,664,454			
Dairy—Other	Regular cottage cheese	689,835,080	248,494,241	185,962,999	262,194,078			
Dairy—Other	Low-fat cottage cheese	347,840,570	288,989,365	288,989,365	304,405,574			
Dairy—Other	Regular ice cream	3,858,399,600	2,903,504,460	2,403,740,705	2,250,676,568			
Dairy—Other	Low-fat ice cream (ice milk)	1,870,739,200	628,540,715	275,494,989	428,747,273			
Dairy—Other	Frozen yogurt and other miscellaneous frozen products	789,218,100	351,439,695	255,817,112	408,168,371			
Dairy—Other	Refrigerated yogurt	2,367,654,300	1,722,897,199	1,573,497,042	1,698,933,938			
Dairy—Other	Total evaporated and condensed canned whole and skim milk	1,227,672,600	57,815,702	57,760,662	307,410,859			
Dairy—Other	Dry whole & nonfat milk	1,286,133,200	156,472,291	98,547,921	341,822,030			
Dairy—Other	Dry buttermilk[b]	58,460,600			8,276,981			

Continued—

Table B-2

Food Purchases, Consumption, and Consumer Loss Estimates: Dairy Products—continued

Category	Food	Previous consumer loss estimate	Expert average consumer loss	Consumer loss (unadjusted for ingredient percentage)			Ingredient use: expert average	Consumer loss (adjusted for ingredient percentage)			Proposed consumer loss estimate	Explanation
				Nielsen data	Nielsen + Perishables data	Availability data		Nielsen data	Nielsen + Perishables data	Availability data		
Dairy—Beverages	Plain whole milk	20%	18%	–100%		10%	23%	–123%		–13%	TBD	Revised ingredient percentage to apply to Availability-based estimate
Dairy—Beverages	Plain 1% and 2% milk	20%	17%	–35%		–5%	22%	–57%		–27%	NA	
Dairy—Beverages	Skim milk	20%	14%	–5%		2%	22%	–27%		–19%	NA	
Dairy—Beverages	Whole flavored milk	20%	14%	–349%		–115%	0%	–349%		–115%	45%	Used estimate for whole flavored milk
Dairy—Beverages	Low-fat flavored milk	20%	14%	–11%		45%	0%	–11%		45%	45%	Estimate based on Availability data (no ingredient use assumed)
Dairy—Beverages	Buttermilk	20%	20%	51%		74%	57%	–6%		18%	18%	Estimate based on Availability data
Dairy—Beverages	Light cream, heavy cream, half & half	20%	19%	16%		71%	58%	–43%		12%	12%	Estimate based on Availability data
Dairy—Beverages	Eggnog	20%	23%	51%		–219%	0%	51%		–219%	51%	Estimate based on Nielsen data
Dairy—Other	Sour cream	20%	19%	63%		74%	66%	–4%		8%	8%	Estimate based on Availability data (could be based on Nielsen)
Dairy—Other	Cream cheese	20%	19%	57%		74%	61%	–4%		13%	13%	Estimate based on Availability data
Dairy—Other	Cheddar cheese	13%	12%	–43%		69%	58%	–100%		11%	11%	Estimate based on Availability data
Dairy—Other	Other American cheese	13%	12%	12%		80%	51%	–39%		28%	28%	Estimate based on Availability data
Dairy—Other	Provolone cheese	13%	12%	38%		67%	53%	–15%		14%	14%	Estimate based on Availability data
Dairy—Other	Parmesan and Romano cheese	13%	12%	60%		75%	67%	–7%		8%	8%	Estimate based on Availability data

Continued—

Table B-2

Food Purchases, Consumption, and Consumer Loss Estimates: Dairy Products—continued

Category	Food	Previous consumer loss estimate	Expert average consumer loss	Consumer loss (unadjusted for ingredient percentage)			Ingredient use: expert average	Consumer loss (adjusted for ingredient percentage)			Proposed consumer loss estimate	Explanation
				Nielsen data	Nielsen + Perishables data	Availability data		Nielsen data	Nielsen + Perishables data	Availability data		
Dairy—Other	Mozzarella cheese	13%	11%	8%		91%	60%	–52%		31%	31%	Estimate based on Availability data
Dairy—Other	Ricotta cheese[b]	13%	12%	78%		92%	80%	–2%		12%	12%	Estimate based on Availability data
Dairy—Other	Other Italian cheese[b]	13%	9%	NC		NC	20%	NC		NC	16%	Average of provolone, parmesan and Romano, mozzarella, and ricotta
Dairy—Other	Swiss cheese	13%	12%	–70%		93%	43%	–114%		50%	50%	Estimate based on Availability data
Dairy—Other	Brick cheese	13%	12%	–1303%		60%	20%	–1,323%		40%	40%	Estimate based on Availability data
Dairy—Other	Muenster cheese	13%	12%	26%		65%	30%	–4%		35%	35%	Estimate based on Availability data
Dairy—Other	Blue cheese	13%	12%	–173%		77%	33%	–207%		43%	43%	Estimate based on Availability data
Dairy—Other	Other miscellaneous cheese[b]	13%	12%	16%		97%	20%	–4%		77%	42%	Average of Swiss, brick, Muenster, and blue
Dairy—Other	Processed cheese	13%	12%	8%		18%	10%	–2%		8%	8%	Estimate based on Availability data
Dairy—Other	Processed cheese foods and spreads	13%	12%	–30%		84%	25%	–55%		59%	8%	Assumed same value as processed cheese
Dairy—Other	Regular cottage cheese	20%	18%	29%		64%	33%	–3%		31%	31%	Estimate based on Availability data
Dairy—Other	Low-fat cottage cheese	20%	17%	5%		17%	13%	–8%		4%	4%	Estimate based on Availability data
Dairy—Other	Regular ice cream	20%	13%	–7%		25%	1%	–7%		24%	24%	Estimate based on Availability data
Dairy—Other	Low-fat ice cream (ice milk)	20%	16%	36%		66%	1%	35%		66%	24%	Assumed same value as regular ice cream

Continued—

Table B-2

Food Purchases, Consumption, and Consumer Loss Estimates: Dairy Products—continued

Category	Food	Previous consumer loss estimate	Expert average consumer loss	Consumer loss (unadjusted for ingredient percentage)			Ingredient use: expert average	Consumer loss (adjusted for ingredient percentage)			Proposed consumer loss estimate	Explanation
				Nielsen data	Nielsen + Perishables data	Availability data		Nielsen data	Nielsen + Perishables data	Availability data		
Dairy—Other	Frozen yogurt and other miscellaneous frozen products	20%	15%	37%		55%	4%	33%		51%	33%	Estimate based on Nielsen data
Dairy—Other	Refrigerated yogurt	20%	13%	7%		27%	7%	1%		21%	21%	Estimate based on Availability data
Dairy—Other	Total evaporated and condensed canned whole and skim milk	20%	15%	81%		95%	81%	1%		15%	15%	Estimate based on Availability data
Dairy—Other	Dry whole & nonfat milk	1%	17%	71%		88%	30%	41%		58%	41%	Estimate based on Nielsen data
Dairy—Other	Dry buttermilk[b]	1%	9%	NC		NC	95%	NC		NC	41%	Assumed same value as dry whole and nonfat milk

Note: Consumer-level loss estimates should be positive. Negative consumer-level loss estimates indicate reported consumption exceeds food purchases.

NA = not available.

NC = not calculated.

TBD = to be decided; reasonable estimate might be calculable if ingredient percentage is revised.

[a]"ERS Availability" refers to the volume of each food available at the consumer level in the Food Availability data series. The definition of these foods may differ somewhat from how we defined them when obtaining consumption data from NHANES.

[b]Food has 10 or fewer consumption observations in NHANES; thus, the total consumption estimate may not be reliable.

Table B-3

Food Purchases, Consumption, and Consumer Loss Estimates: Fats and Oils

Category	Food	ERS availability[a]	NHANES consumption		Nielsen purchases		Nielsen + Perishables	
			Total (lbs)	Store only (lbs)	All purchases (lbs)	Random-weight only (lbs)	Perishables Group: non-UPC (lbs)	All purchases: Nielsen UPC + Perishables non-UPC (lbs)
Fats and oils	Butter	1,227,672,600	305,720,265	224,299,108	494,907,161			
Fats and oils	Margarine	1,432,284,700	362,886,075	315,500,636	1,258,601,500			
Fats and oils	Lard	116,921,200						
Fats and oils	Edible beef tallow	578,759,940						
Fats and oils	Shortening	7,512,187,100						
Fats and oils	Salad and cooking oils	9,207,544,500	2,049,615,355	1,074,474,443	1,824,782,952			
Fats and oils	Other edible fats and oils	409,224,200	103,886,539	58,565,324				

Continued—

Table B-3

Food Purchases, Consumption, and Consumer Loss Estimates: Fats and Oils—continued

Category	Food	Previous consumer loss estimate	Expert average consumer loss	Consumer loss (unadjusted for ingredient percentage)			Ingredient use: expert average	Consumer loss (adjusted for ingredient percentage)			Proposed consumer loss estimate	Explanation
				Nielsen data	Nielsen + Perishables data	Availability data		Nielsen data	Nielsen + Perishables data	Availability data		
Fats and oils	Butter	15%	10%	55%		75%	40%	15%		35%	35%	Estimate based on Availability data (could be based on Nielsen)
Fats and oils	Margarine	15%	11%	75%		75%	40%	35%		35%	35%	Estimate based on Nielsen and Availability data
Fats and oils	Lard	0%	25%	NC		NC	100%	NC		NC	35%	Assumed same value as margarine
Fats and oils	Edible beef tallow	0%	25%	NC		NC	100%	NC		NC	35%	Assumed same value as margarine
Fats and oils	Shortening	15%	15%	NC		NC	100%	NC		NC	35%	Assumed same value as margarine
Fats and oils	Salad and cooking oils	20%	19%	41%		78%	63%	–22%		15%	15%	Estimate based on Availability data
Fats and oils	Other edible fats and oils	0%	20%	NC		75%	73%	NC		1%	25%	Average of butter/margarine and salad and cooking oils

Note: Consumer-level loss estimates should be positive. Negative consumer-level loss estimates indicate reported consumption exceeds food purchases.

NC = not calculated.

[a]"ERS Availability" refers to the volume of each food available at the consumer level in the Food Availability data series. The definition of these foods may differ somewhat from how we defined them when obtaining consumption data from NHANES.

Table B-4

Food Purchases, Consumption, and Consumer Loss Estimates: Fruits

Category	Food	ERS availability[a]	NHANES consumption		Nielsen purchases		Nielsen + Perishables	
			Total (lbs)	Store only (lbs)	All purchases (lbs)	Random-weight only (lbs)	Perishables Group: non-UPC (lbs)	All purchases: Nielsen UPC + Perishables non-UPC (lbs)
Fruits—fresh	Fresh oranges	1,963,106,948	1,222,015,950	1,032,993,307	770,682,897	347,750,852		
Fruits	Fresh tangerines	497,499,706	95,932,593	81,864,769	176,592,455	56,589,141		
Fruits	Fresh grapefruit	511,530,250	225,765,893	205,416,954	158,044,581	77,452,533		
Fruits	Fresh lemons	402,793,534	35,393,836	26,339,801	79,793,295	61,878,350		
Fruits	Fresh limes[b]	392,855,232	5,474,806	4,421,995	62,387,114	54,761,974		
Fruits	Fresh apples	4,329,592,036	3,213,079,388	2,842,975,346	1,629,372,912	1,008,355,474	1,120,992,389	1,742,009,828
Fruits	Fresh apricots[b]	27,184,179	22,533,828	22,533,828	13,845,048	13,392,044		
Fruits	Fresh avocados	577,590,728	169,181,057	119,493,123	165,985,459	153,504,763	37,754,601	50,235,298
Fruits	Fresh bananas	4,312,930,765	3,475,879,017	3,287,736,304	2,152,293,657	2,045,381,639	2,332,122,851	2,439,034,869
Fruits	Fresh blueberries	114,582,776	84,845,617	76,922,249	116,915,076	11,932,307		
Fruits	Fresh cantaloupe	1,207,503,693	665,932,916	469,233,878	282,309,408	275,645,656		
Fruits	Fresh cherries	210,458,160	3,373,418	1,956,498	131,627,918	108,172,765	74,701,131	98,156,284
Fruits	Fresh cranberries[b]	27,768,785	338,000	241,328	16,111,010	1,291,015		
Fruits	Fresh grapes	1,767,848,544	1,165,449,932	1,035,772,108	955,064,534	862,909,348	589,069,468	681,224,654
Fruits	Fresh honeydew	242,026,884	66,742,016	15,160,386	37,597,678	35,590,356		
Fruits	Fresh kiwi	100,552,232	54,531,195	47,232,316	36,669,728	33,900,915		
Fruits	Fresh mangoes	342,871,419	228,941,497	208,200,459	68,263,040	59,059,406		
Fruits	Fresh peaches	1,092,628,614	469,887,063	447,333,713	307,636,161	298,671,292		
Fruits	Fresh pears	672,296,900	640,785,877	569,646,798	188,781,986	161,407,516	184,955,059	212,329,529
Fruits	Fresh pineapple	562,390,972	138,936,964	73,371,716	153,595,450	30,812,764	222,281,773	345,064,459
Fruits	Fresh papaya[b]	176,258,709	16,786,410	14,827,325	24,690,845	24,163,692		
Fruits	Fresh plums	247,288,338	162,107,512	158,692,697	113,229,817	100,607,598		
Fruits	Fresh strawberries	1,208,965,208	667,834,374	562,781,651	532,226,307	106,111,973		
Fruits	Fresh watermelon	1,565,574,868	1,320,088,742	1,026,792,871	738,047,693	530,043,107		
Fruits—canned	Canned apples and applesauce	993,830,200	499,420,344	331,928,583	498,482,916			
Fruits	Canned apricots[b]	29,230,300	16,173,917	11,969,258	10,871,094			
Fruits	Canned cherries[b]	29,230,300	2,602,861	2,318,254	21,139,596			

Continued—

Table B-4

Food Purchases, Consumption, and Consumer Loss Estimates: Fruits—continued

Category	Food	ERS availability[a]	NHANES consumption		Nielsen purchases		Nielsen + Perishables	
			Total (lbs)	Store only (lbs)	All purchases (lbs)	Random-weight only (lbs)	Perishables Group: non-UPC (lbs)	All purchases: Nielsen UPC + Perishables non-UPC (lbs)
Fruits	Canned peaches	292,303,000	350,002,311	262,886,658	219,927,529			
Fruits	Canned pears	993,830,200	116,114,531	76,868,620	78,206,618			
Fruits	Canned pineapple	409,224,200	207,571,736	166,251,486	223,074,295			
Fruits	Canned plums[b]	818,448,400	13,737,821	1,155,599	2,064,557			
Fruits	Canned olives	643,066,600	93,469,918	52,644,320	80,821,972			
Fruits—frozen	Frozen blackberries	29,230,300	2,261,098	2,261,098	4,589,555			
Fruits	Frozen blueberries[b]	58,460,600	14,701,957	13,997,025	23,748,864			
Fruits	Frozen cherries[b]				3,142,092			
Fruits	Frozen raspberries[b]	58,460,600	1,719,168	1,719,168	8,281,772			
Fruits	Frozen strawberries[b]	467,684,800	52,269,862	49,752,383	66,882,421			
Fruits	Other frozen berries[b]	8,184,484	487,125	487,125	59,961			
Fruits	Frozen apples[b]	146,151,500			2,534,306			
Fruits	Frozen apricots[b]	11,692,120						
Fruits	Frozen peaches[b]	116,921,200	19,755,733	4,611,341	6,924,664			
Fruits	Other frozen fruit[b]							
Fruits	Dried apples[b]	23,384,240			2,431,029			
Fruits	Dried apricots[b]	26,307,270	279,432	279,432	17,757,489			
Fruits	Dried dates[b]	35,076,360	5,022,022	3,985,676	9,542,288			
Fruits	Dried figs[b]	35,076,360			2,599,160			
Fruits	Dried peaches[b]	11,692,120			561,225			
Fruits	Dried pears[b]	1,169,212	1,924,979	1,924,979	23,805			
Fruits	Dried plums	99,383,020	30,108,376	25,108,934	48,795,230			
Fruits	Raisins	409,224,200	61,982,962	52,196,711	123,816,423			
Fruits—Juices	Grapefruit juice	509,347,976	599,331,439	568,152,023	276,387,729			
Fruits—Juices	Lemon juice	251,580,782	20,462,076	11,737,339	94,731,845			
Fruits—Juices	Lime juice	30,437,150	11,818,487	5,966,400	8,272,716			

Continued—

Table B-4

Food Purchases, Consumption, and Consumer Loss Estimates: Fruits—continued

Category	Food	ERS availability[a]	NHANES consumption		Nielsen purchases		Nielsen + Perishables	
			Total (lbs)	Store only (lbs)	All purchases (lbs)	Random-weight only (lbs)	Perishables Group: non-UPC (lbs)	All purchases: Nielsen UPC + Perishables non-UPC (lbs)
Fruits—Juices	Orange juice	8,985,764,397	12,733,302,026	10,986,041,987	6,470,320,254			
Fruits—Juices	Apple juice	4,928,508,761	5,023,276,999	4,231,237,843	2,051,347,616			
Fruits—Juices	Cranberry juice[b]	521,720,802	2,876,531	2,876,531	178,936,640			
Fruits—Juices	Grape juice	1,043,441,603	25,184,202	22,742,226	801,246,906			
Fruits—Juices	Pineapple juice	773,301,584	173,356,667	163,380,482	143,933,120			
Fruits—Juices	Prune juice	257,767,195	78,135,004	78,135,004	114,617,417			

Continued—

Table B-4

Food Purchases, Consumption, and Consumer Loss Estimates: Fruits—continued

Category	Food	Previous consumer loss estimate	Expert average consumer loss	Consumer loss (unadjusted for ingredient percentage)			Ingredient use: expert average	Consumer loss (adjusted for ingredient percentage)			Proposed consumer loss estimate	Explanation
				Nielsen data	Nielsen + Perishables data	Availability data		Nielsen data	Nielsen + Perishables data	Availability data		
Fruits	Fresh oranges	20%	23%	–34%		38%	2%	–36%		36%	36%	Estimate based on Availability data
Fruits	Fresh tangerines	20%	23%	54%		81%	2%	52%		79%	52%	Estimate based on Nielsen data
Fruits	Fresh grapefruit	20%	23%	–30%		56%	2%	–32%		54%	54%	Estimate based on Availability data
Fruits	Fresh lemons	20%	24%	67%		91%	23%	44%		69%	44%	Estimate based on Nielsen data
Fruits	Fresh limes[b]	20%	26%	93%		99%	18%	75%		80%	44%	Assumed same value as fresh lemons
Fruits	Fresh apples	20%	18%	–74%	–63%	26%	23%	–98%	–87%	2%	TBD	Revised ingredient percentage to apply to Availability-based estimate
Fruits	Fresh apricots[b]	20%	20%	–63%		17%	8%	–70%		10%	10%	Estimate based on Availability data
Fruits	Fresh avocados	20%	33%	28%	–138%	71%	18%	11%	–155%	53%	32%	Estimate based on average of Availability and Nielsen

Continued—

Table B-4

Food Purchases, Consumption, and Consumer Loss Estimates: Fruits—continued

Category	Food	Previous consumer loss estimate	Expert average consumer loss	Consumer loss (unadjusted for ingredient percentage)			Ingredient use: expert average	Consumer loss (adjusted for ingredient percentage)			Proposed consumer loss estimate	Explanation
				Nielsen data	Nielsen + Perishables data	Availability data		Nielsen data	Nielsen + Perishables data	Availability data		
Fruits	Fresh bananas	20%	22%	–53%	–35%	19%	20%	–73%	–55%	–1%	TBD	Revised ingredient percentage to apply to Availability-based estimate
Fruits	Fresh blueberries	20%	19%	34%		26%	23%	12%		3%	8%	Estimate based on average of Availability and Nielsen
Fruits	Fresh cantaloupe	20%	26%	–66%		45%	2%	–68%		43%	43%	Estimate based on Availability data
Fruits	Fresh cherries	20%	17%	99%	98%	98%	47%	52%	51%	51%	51%	Estimate based on Nielsen+Perishables or Availability data
Fruits	Fresh cranberries[b]	20%	14%	99%		99%	73%	26%		26%	26%	Estimate based on Nielsen or Availability data
Fruits	Fresh grapes	20%	20%	–8%	–52%	34%	1%	–9%	–53%	33%	33%	Estimate based on Availability data
Fruits	Fresh honeydew	20%	21%	60%		72%	1%	59%		71%	43%	Assumed same value as fresh cantaloupe
Fruits	Fresh kiwi	20%	22%	–29%		46%	1%	–30%		45%	45%	Estimate based on Availability data
Fruits	Fresh mangoes	20%	21%	–205%		33%	20%	–225%		13%	13%	Estimate based on Availability data
Fruits	Fresh peaches	35%	22%	–45%		57%	15%	–60%		42%	42%	Estimate based on Availability data
Fruits	Fresh pears	20%	20%	–202%	–168%	5%	8%	–209%	–176%	–3%	TBD	Used same value as fresh apples
Fruits	Fresh pineapple	20%	19%	52%	79%	75%	15%	37%	64%	60%	37%	Estimate based on Nielsen data
Fruits	Fresh papaya[b]	20%	24%	40%		90%	20%	20%		70%	20%	Estimate based on Nielsen data
Fruits	Fresh plums	20%	19%	–40%		34%	8%	–48%		27%	27%	Estimate based on Availability data
Fruits	Fresh strawberries	20%	24%	–6%		45%	10%	–16%		35%	35%	Estimate based on Availability data
Fruits	Fresh watermelon	20%	22%	–39%		16%	3%	–42%		13%	13%	Estimate based on Availability data
Fruits	Canned apples and applesauce	10%	14%	33%		50%	25%	8%		25%	8%	Estimate based on Nielsen data
Fruits	Canned apricots[b]	10%	13%	–10%		45%	18%	–28%		27%	27%	Estimate based on Availability data
Fruits	Canned cherries[b]	10%	12%	89%		91%	58%	32%		34%	32%	Estimate based on Nielsen data
Fruits	Canned peaches	10%	13%	–20%		–20%	19%	–38%		–38%	9%	Assumed same value as canned pineapple

Continued—

Table B-4

Food Purchases, Consumption, and Consumer Loss Estimates: Fruits—continued

Category	Food	Previous consumer loss estimate	Expert average consumer loss	Consumer loss (unadjusted for ingredient percentage)			Ingredient use: expert average	Consumer loss (adjusted for ingredient percentage)			Proposed consumer loss estimate	Explanation
				Nielsen data	Nielsen + Perishables data	Availability data		Nielsen data	Nielsen + Perishables data	Availability data		
Fruits	Canned pears	10%	13%	2%		88%	18%	–16%		71%	9%	Assumed same value as canned pineapple
Fruits	Canned pineapple	10%	17%	25%		49%	16%	9%		33%	9%	Estimate based on Nielsen data
Fruits	Canned plums[b]	10%	18%	44%		98%	18%	26%		81%	26%	Estimate based on Nielsen data
Fruits	Canned olives	10%	15%	35%		85%	10%	25%		75%	25%	Estimate based on Nielsen data
Fruits	Frozen blackberries	10%	11%	51%		92%	53%	–2%		40%	40%	Estimate based on Availability data
Fruits	Frozen blueberries[b]	10%	12%	41%		75%	46%	–5%		29%	29%	Estimate based on Availability data
Fruits	Frozen cherries[b]	10%	13%	NC		NC	78%	NC		NC	29%	Assumed same value as frozen blueberries
Fruits	Frozen raspberries[b]	10%	13%	79%		97%	55%	24%		42%	24%	Estimate based on Nielsen data
Fruits	Frozen strawberries[b]	10%	15%	26%		89%	65%	–39%		24%	24%	Estimate based on Availability data
Fruits	Other frozen berries[b]	10%	13%	–712%		94%	64%	–776%		30%	30%	Estimate based on Availability data
Fruits	Frozen apples[b]	10%	12%	NC		NC	78%	NC		NC	35%	Assumed same value as frozen peaches
Fruits	Frozen apricots[b]	10%	12%	NC		NC	64%	NC		NC	35%	Assumed same value as frozen peaches
Fruits	Frozen peaches[b]	10%	15%	33%		83%	48%	–15%		35%	35%	Estimate based on Availability data
Fruits	Other frozen fruit[b]	10%	12%	NC		NC	53%	NC		NC	35%	Assumed same value as frozen peaches
Fruits	Dried apples[b]	10%	15%	NC		NC	34%	NC		NC	11%	Assumed same value as dried plums
Fruits	Dried apricots[b]	10%	15%	98%		99%	20%	78%		79%	11%	Assumed same value as dried plums
Fruits	Dried dates[b]	10%	13%	58%		86%	33%	25%		52%	25%	Estimate based on Nielsen data
Fruits	Dried figs[b]	10%	13%	NC		NC	22%	NC		NC	25%	Assumed same value as dried dates
Fruits	Dried peaches[b]	10%	16%	NC		NC	19%	NC		NC	11%	Assumed same value as dried plums
Fruits	Dried pears[b]	10%	16%	–7,986%		–65%	16%	–8,003%		–81%	11%	Assumed same value as dried plums
Fruits	Dried plums	10%	18%	49%		70%	38%	11%		32%	11%	Estimate based on Nielsen data

Continued—

Table B-4

Food Purchases, Consumption, and Consumer Loss Estimates: Fruits—continued

Category	Food	Previous consumer loss estimate	Expert average consumer loss	Consumer loss (unadjusted for ingredient percentage)			Ingredient use: expert average	Consumer loss (adjusted for ingredient percentage))			Proposed consumer loss estimate	Explanation
				Nielsen data	Nielsen + Perishables data	Availability data		Nielsen data	Nielsen + Perishables data	Availability Data		
Fruits	Raisins	10%	13%	58%		85%	32%	26%		53%	26%	Estimate based on Nielsen data
Fruits—Juices	Grapefruit juice	10%	18%	–106%		–18%	0%	–106%		–18%	NA	
Fruits—Juices	Lemon juice	10%	17%	88%		92%	95%	–7%		–3%	NA	
Fruits—Juices	Lime juice	10%	17%	28%		61%	95%	–67%		–34%	NA	
Fruits—Juices	Orange juice	10%	15%	–70%		–42%	5%	–75%		–47%	NA	
Fruits—Juices	Apple juice	10%	17%	–106%		–2%	5%	–111%		–7%	NA	
Fruits—Juices	Cranberry juice[b]	10%	14%	98%		99%	5%	93%		94%	NA	
Fruits—Juices	Grape juice	10%	15%	97%		98%	0%	97%		98%	NA	
Fruits—Juices	Pineapple juice	10%	13%	–14%		78%	10%	–24%		68%	NA	
Fruits—Juices	Prune juice	10%	20%	32%		70%	0%	32%		70%	32%	Estimate based on Nielsen data

Note: Consumer-level loss estimates should be positive. Negative consumer-level loss estimates indicate reported consumption exceeds food purchases.

NA = not available.

NC = not calculated.

TBD = to be decided; reasonable estimate might be calculable if ingredient percentage is revised.

[a]"ERS Availability" refers to the volume of each food available at the consumer level in the Food Availability data series. The definition of these foods may differ somewhat from how we defined them when obtaining consumption data from NHANES.

[b]Food has 10 or fewer consumption observations in NHANES; thus, the total consumption estimate may not be reliable.

Table B-5

Food Purchases, Consumption, and Consumer Loss Estimates: Vegetables

Category	Food	ERS availability[a]	NHANES consumption		Nielsen purchases		Nielsen + Perishables	
			Total (lbs)	Store only (lbs)	All purchases (lbs)	Random-weight only (lbs)	Perishables Group: non-UPC (lbs)	All purchases: Nielsen UPC + Perishables non-UPC (lbs)
Vegetables	Fresh artichokes[b]	58,460,600	30,113,786	27,433,069	32,501,663	9,086,677		
Vegetables	Fresh asparagus[b]	139,428,531	165,981,716	129,966,733	61,708,802	49,189,486		
Vegetables	Fresh bell peppers	1,351,842,914	483,944,303	248,500,592	312,026,050	292,772,133	255,791,319	275,045,236
Vegetables	Fresh broccoli	846,947,943	635,345,598	419,047,533	219,073,767	165,763,792		
Vegetables	Fresh brussels sprouts	52,614,540	73,263,518	49,721,335	17,523,794	14,699,349		
Vegetables	Fresh cabbage	1,592,466,744	427,547,167	362,664,505	314,180,911	305,248,541		
Vegetables	Fresh carrots	1,958,927,015	820,575,282	560,037,733	786,952,339	88,326,077	505,991,531	1,204,617,793
Vegetables	Fresh cauliflower	143,637,694	172,108,841	101,287,864	125,202,930	33,509,078		
Vegetables	Fresh celery	1,324,161,820	125,328,745	95,495,803	289,417,477	144,734,440	118,182,687	262,865,724
Vegetables	Fresh collard greens	76,641,847	83,493,615	61,314,958	31,697,928			
Vegetables	Fresh sweet corn	783,956,646	659,196,877	436,433,131	88,686,523	82,637,835	74,606,280	80,654,968
Vegetables	Fresh cucumbers	1,113,849,812	648,842,611	473,883,088	293,201,085	272,499,750	65,115,425	85,816,759
Vegetables	Fresh eggplant[b]	153,897,530	24,602,286	15,223,658	31,109,645	31,053,997		
Vegetables	Fresh garlic[b]	465,375,606	155,711	155,711	9,886,424	1,279,499		
Vegetables	Fresh kale[b]	44,576,208	20,746,683	10,007,351	2,227,050			
Vegetables	Fresh romaine and leaf lettuce and escarole and endive[b]	6,475,329,898	3,420,619,369	1,934,493,656	1,722,372,910	315,597,246	121,037,691	1,527,813,355
Vegetables	Fresh lima beans[b]	6,430,666	27,518,216	633,192	59,996			
Vegetables	Fresh mushrooms	609,597,907	178,495,160	114,328,863	167,163,581	33,484,841	120,440,023	254,118,763
Vegetables	Fresh mustard greens[b]	106,018,298	4,830,559	4,830,559	3,611,017			
Vegetables	Fresh okra	80,441,786	9,234,913	4,287,924	399,859			
Vegetables	Fresh onions	4,709,001,330	744,377,347	320,067,216	1,234,388,808	674,299,334	901,274,704	1,461,364,178
Vegetables	Fresh potatoes	11,312,126,100	5,616,699,046	3,132,932,340	3,176,725,667	423,170,606	2,439,661,035	5,267,819,033
Vegetables	Fresh pumpkin[b]	791,848,827	4,557,477	4,557,477	5,605,511			
Vegetables	Fresh radishes	110,490,534	27,411,664	18,502,991	82,823,640	60,899,431	38,925,131	60,849,340
Vegetables	Fresh snap beans	401,273,558	392,563,424	191,057,172	89,318,559	86,637,033		
Vegetables	Fresh spinach	317,791,822	258,151,655	170,797,226	79,471,371	24,301,184		

Continued—

Table B-5

Food Purchases, Consumption, and Consumer Loss Estimates: Vegetables—continued

Category	Food	ERS availability[a]	NHANES consumption		Nielsen purchases		Nielsen + Perishables	
			Total (lbs)	Store only (lbs)	All purchases (lbs)	Random-weight only (lbs)	Perishables Group: non-UPC (lbs)	All purchases: Nielsen UPC + Perishables non-UPC (lbs)
Vegetables	Fresh squash	702,930,254	395,970,595	220,237,929	237,123,847	219,354,833		
Vegetables	Fresh sweet potatoes	977,870,456	332,693,259	210,806,848	270,603,347	196,000,410		
Vegetables	Fresh tomatoes	3,989,935,950	2,961,778,511	1,705,582,182	991,270,793	728,088,794	626,221,431	889,403,430
Vegetables	Fresh turnip greens[b]	77,752,598	15,611,759	11,380,757	2,482,777			
Vegetables	Canned asparagus[b]	46,768,480	29,273,654	28,918,753	30,992,370			
Vegetables	Canned snap beans	613,836,300	831,624,243	564,402,348	495,483,037			
Vegetables	Canned cabbage (sauerkraut)	134,459,380	17,608,243	17,166,749	104,439,678			
Vegetables	Canned carrots[b]	362,455,720	43,235,691	33,416,463	56,480,786			
Vegetables	Canned sweet corn	1,645,665,890	503,469,137	411,771,928	515,700,446			
Vegetables	Canned cucumbers (pickles)	534,914,490	489,551,298	333,075,949	329,697,999			
Vegetables	Canned green peas[b]	222,150,280	135,790,955	111,408,860	208,852,542			
Vegetables	Canned chile peppers	1,227,672,600	42,787,270	24,581,588	7,839,071			
Vegetables	Canned tomatoes	7,950,641,600	453,220,338	317,598,111	845,835,971			
Vegetables	Canned mushrooms[b]	277,687,850	17,930,797	9,731,381	58,534,234			
Vegetables	Canned potatoes[b]	236,765,430	25,190,042	4,066,154	57,820,519			
Vegetables	Other canned vegetables[b]							
Vegetables	Frozen asparagus	8,769,090			3,993,442			
Vegetables	Frozen snap beans	453,069,650	221,967,681	181,979,181	103,221,194			
Vegetables	Frozen broccoli	549,529,640	227,004,571	177,853,102	213,237,795			
Vegetables	Frozen carrots[b]	192,919,980	46,154,085	37,226,482	29,558,075			
Vegetables	Frozen cauliflower[b]	73,075,750	14,175,222	13,532,057	29,636,211			
Vegetables	Frozen sweet corn	672,296,900	196,198,214	129,549,535	219,807,108			
Vegetables	Frozen green peas[b]	137,382,410	168,972,231	155,132,060	145,406,425			

Continued—

Table B-5

Food Purchases, Consumption, and Consumer Loss Estimates: Vegetables—continued

Category	Food	ERS availability[a]	NHANES consumption		Nielsen purchases		Nielsen + Perishables	
			Total (lbs)	Store only (lbs)	All purchases (lbs)	Random-weight only (lbs)	Perishables Group: non-UPC (lbs)	All purchases: Nielsen UPC + Perishables non-UPC (lbs)
Vegetables	Frozen lima beans	35,076,360	35,173,677	24,954,164	41,398,509			
Vegetables	Frozen spinach	178,304,830	72,893,823	60,403,581	75,602,746			
Vegetables	Frozen potatoes	7,862,950,700	3,697,625,051	564,447,979	269,514,333			
Vegetables	Other frozen vegetables[b]							
Vegetables	Dehydrated onions							
Vegetables	Dehydrated potatoes	529,068,430	244,580,775	215,035,499	692,014,443			
Vegetables	Potato chips and shoestring potatoes	1,137,058,670	1,168,276,951	1,013,767,038	971,582,640			
Vegetables	Dry edible beans	1,639,819,830	1,378,351,818	1,045,069,823	311,951,763			
Vegetables	Dry edible peas and lentils		70,868,584	69,753,912	32,093,741			

Continued—

Table B-5

Food Purchases, Consumption, and Consumer Loss Estimates: Vegetables—continued

Category	Food	Previous consumer loss estimate	Expert average consumer loss	Consumer loss (unadjusted for ingredient percentage)			Ingredient use: expert average	Consumer loss (adjusted for ingredient percentage)			Proposed consumer loss estimate	Explanation
				Nielsen data	Nielsen + Perishables data	Availability data		Nielsen data	Nielsen + Perishables data	Availability Data		
Vegetables	Fresh artichokes[b]	20%	20%	16%		48%	30%	–14%		18%	18%	Estimate based on Availability data
Vegetables	Fresh asparagus[b]	20%	19%	–111%		–19%	13%	–124%		–32%	18%	Used same value as fresh artichokes
Vegetables	Fresh bell peppers	20%	17%	20%	10%	64%	25%	–5%	–15%	39%	39%	Estimate based on Availability data
Vegetables	Fresh broccoli	20%	20%	–91%		25%	13%	–105%		12%	12%	Estimate based on Availability data
Vegetables	Fresh brussels sprouts	20%	23%	–184%		–39%	10%	–194%		–49%	12%	Used same value as fresh broccoli
Vegetables	Fresh cabbage	20%	21%	–15%		73%	15%	–30%		58%	24%	Used same value as fresh lettuce
Vegetables	Fresh carrots	20%	15%	29%	54%	58%	20%	9%	34%	39%	34%	Estimate based on Nielsen+ Perishables
Vegetables	Fresh cauliflower	20%	23%	19%		–20%	10%	9%		–30%	9%	Estimate based on Nielsen
Vegetables	Fresh celery	20%	21%	67%	64%	91%	25%	42%	39%	66%	39%	Estimate based on Nielsen+ Perishables
Vegetables	Fresh collard greens	20%	18%	–93%		–9%	10%	–103%		–19%	38%	Used same value as fresh kale
Vegetables	Fresh sweet corn	32%	20%	–392%	–441%	16%	15%	–407%	–456%	1%	TBD	Revise ingredient percentage to apply to Availability-based estimate
Vegetables	Fresh cucumbers	20%	18%	–62%	–452%	42%	10%	–72%	–462%	32%	32%	Estimate based on Availability data
Vegetables	Fresh eggplant[b]	27%	25%	51%		84%	25%	26%		59%	26%	Estimate based on Nielsen
Vegetables	Fresh garlic[b]	20%	16%	98%		100%	32%	67%		68%	43%	Used same value as onions
Vegetables	Fresh kale[b]	20%	19%	–349%		53%	15%	–364%		38%	38%	Estimate based on Availability data
Vegetables	Fresh romaine and leaf lettuce and escarole and endive[b]	20%	27%	–12%	–27%	47%	23%	–36%	–50%	24%	24%	Estimate based on Availability data
Vegetables	Fresh lima beans[b]	20%	24%	–955%		–328%	23%	–978%		–350%	27%	Used same value as frozen lima beans

Continued—

Table B-5

Food Purchases, Consumption, and Consumer Loss Estimates: Vegetables—continued

Category	Food	Previous consumer loss estimate	Expert average consumer loss	Consumer loss (unadjusted for ingredient percentage)			Ingredient use: expert average	Consumer loss (adjusted for ingredient percentage)			Proposed consumer loss estimate	Explanation
				Nielsen data	Nielsen + Perishables data	Availability data		Nielsen data	Nielsen + Perishables data	Availability data		
Vegetables	Fresh mushrooms	20%	23%	32%	55%	71%	34%	–2%	21%	37%	21%	Estimate based on Nielsen+ Perishables
Vegetables	Fresh mustard greens[b]	20%	20%	–34%		95%	10%	–44%		85%	38%	Used same value as fresh kale
Vegetables	Fresh okra	20%	23%	–972%		89%	17%	–989%		72%	TBD	Revised ingredient percentage to apply to Availability–based estimate
Vegetables	Fresh onions	35%	20%	74%	78%	84%	35%	39%	43%	49%	43%	Estimate based on Nielsen+ Perishables
Vegetables	Fresh potatoes	30%	20%	1%	41%	50%	25%	–24%	16%	25%	16%	Estimate based on Nielsen+ Perishables
Vegetables	Fresh pumpkin[b]	20%	18%	19%		99%	30%	–11%		69%	69%	Estimate based on Availability data
Vegetables	Fresh radishes	20%	23%	78%	70%	75%	23%	55%	47%	52%	47%	Estimate based on Nielsen+ Perishables
Vegetables	Fresh snap beans	22%	21%	–114%		2%	18%	–132%		–16%	24%	Used same value as frozen snap beans
Vegetables	Fresh spinach	20%	27%	–115%		19%	10%	–125%		9%	9%	Estimate based on Availability data
Vegetables	Fresh squash	20%	22%	7%		44%	18%	–11%		25%	25%	Estimate based on Availability data
Vegetables	Fresh sweet potatoes	31%	17%	22%		66%	22%	0%		44%	44%	Estimate based on Availability data
Vegetables	Fresh tomatoes	20%	20%	–72%	–92%	26%	18%	–90%	–110%	7%	7%	Estimate based on Availability data
Vegetables	Fresh turnip greens[b]	20%	20%	–358%		80%	15%	–373%		65%	38%	Used same value as fresh kale
Vegetables	Canned asparagus[b]	10%	10%	7%		37%	5%	2%		32%	2%	Estimate based on Nielsen data
Vegetables	Canned snap beans	10%	10%	–14%		–35%	5%	–19%		–40%	24%	Used same value as canned green peas
Vegetables	Canned cabbage (sauerkraut)	10%	15%	84%		87%	5%	79%		82%	16%	Used average of all canned vegetables

Continued—

Table B-5

Food Purchases, Consumption, and Consumer Loss Estimates: Vegetables—continued

Category	Food	Previous consumer loss estimate	Expert average consumer loss	Consumer loss (unadjusted for ingredient percentage)			Ingredient use: expert average	Consumer loss (adjusted for ingredient percentage)			Proposed consumer loss estimate	Explanation
				Nielsen data	Nielsen + Perishables data	Availability data		Nielsen data	Nielsen + Perishables data	Availability data		
Vegetables	Canned carrots[b]	10%	13%	41%		88%	10%	31%		78%	31%	Estimate based on Nielsen data
Vegetables	Canned sweet corn	10%	11%	20%		69%	14%	7%		56%	7%	Estimate based on Nielsen data
Vegetables	Canned cucumbers (pickles)	10%	9%	–1%		8%	5%	–6%		3%	3%	Estimate based on Availability data
Vegetables	Canned green peas[b]	10%	17%	47%		39%	23%	24%		16%	24%	Estimate based on Nielsen data
Vegetables	Canned chile peppers	10%	11%	–214%		97%	93%	–306%		4%	4%	Estimate based on Availability data
Vegetables	Canned tomatoes	10%	13%	62%		94%	66%	–4%		28%	28%	Estimate based on Availability data
Vegetables	Canned mushrooms[b]	10%	14%	83%		94%	74%	9%		20%	9%	Estimate based on Nielsen data
Vegetables	Canned potatoes[b]	10%	13%	93%		89%	65%	28%		24%	28%	Estimate based on Nielsen data
Vegetables	Other canned vegetables[b]	10%	13%	NC		NC	20%	NC		NC	16%	Used average of all canned vegetables
Vegetables	Frozen asparagus	30%	18%	NC		NC	5%	NC		NC	26%	Used average for all frozen vegetables
Vegetables	Frozen snap beans	20%	17%	–76%		51%	28%	–104%		24%	24%	Estimate based on Availability data
Vegetables	Frozen broccoli	16%	14%	17%		59%	5%	12%		54%	12%	Estimate based on Nielsen data
Vegetables	Frozen carrots[b]	12%	15%	–26%		76%	5%	–31%		71%	34%	Used same value as fresh carrots
Vegetables	Frozen cauliflower[b]	17%	14%	54%		81%	28%	27%		53%	27%	Estimate based on Nielsen data
Vegetables	Frozen sweet corn	14%	13%	41%		71%	5%	36%		66%	36%	Estimate based on Nielsen data
Vegetables	Frozen green peas[b]	17%	14%	–7%		–23%	10%	–17%		–33%	24%	Used same value as frozen snap beans
Vegetables	Frozen lima beans	32%	21%	40%		0%	13%	27%		–13%	27%	Estimate based on Nielsen data
Vegetables	Frozen spinach	23%	16%	20%		59%	25%	–5%		34%	34%	Estimate based on Availability data

Continued—

Table B-5

Food Purchases, Consumption, and Consumer Loss Estimates: Vegetables—continued

Category	Food	Previous consumer loss estimate	Expert average consumer loss	Consumer loss (unadjusted for ingredient percentage)			IIngredient use: expert average	Consumer loss (adjusted for ingredient percentage)			Proposed consumer loss estimate	Explanation
				Nielsen data	Nielsen + Perishables data	Availability data		Nielsen dta	Nielsen + Perishables data	Availability data		
Vegetables	Frozen potatoes	32%	22%	–109%		53%	52%	–161%		1%	16%	Used same value as fresh potatoes
Vegetables	Other frozen vegetables[b]	23%	15%	NC		NC	5%	NC		NC	26%	Used average for all frozen vegetables
Vegetables	Dehydrated onions	10%	5%	NC		NC	100%	NC		NC	4%	Used same estimate as Dehydrated potatoes
Vegetables	Dehydrated potatoes	10%	10%	69%		54%	65%	4%		–11%	4%	Estimate based on Nielsen data
Vegetables	Potato chips and shoestring potatoes	10%	8%	–4%		–3%	2%	–6%		–5%	4%	Used same estimate as dehydrated potatoes
Vegetables	Dry edible beans	10%	15%	–235%		16%	75%	–310%		–59%	NA	
Vegetables	Dry edible peas and lentils	10%	15%	–117%		NC	75%	–192%		NC	NA	

Note: Consumer-level loss estimates should be positive. Negative consumer-level loss estimates indicate reported consumption exceeds food purchases.

NA = not available.

NC = not calculated.

TBD = to be decided; reasonable estimate might be calculable if ingredient percentage is revised.

[a]"ERS Availability" refers to the volume of each food available at the consumer level in the Food Availability data series. The definition of these foods may differ somewhat from how we defined them when obtaining consumption data from NHANES.

[b]Food has 10 or fewer consumption observations in NHANES; thus, the total consumption estimate may not be reliable.

Table B-6

Food Purchases, Consumption, and Consumer Loss Estimates: Grains

Category	Food	ERS availability[a]	NHANES consumption		Nielsen purchases		Nielsen + Perishables	
			Total (lbs)	Store only (lbs)	All purchases (lbs)	Random-weight only (lbs)	Perishables Group: non-UPC (lbs)	All purchases: Nielsen UPC + Perishables non-UPC (lbs)
Grains	White and whole wheat flour							
Grains	Durum flour							
Grains	Rice	5,466,066,100	3,687,468,888	2,791,629,634	1,023,791,318			
Grains	Rye flour							
Grains	Corn flour and meal							
Grains	Corn hominy and grits	2,016,890,700	609,351,609	496,644,366	458,411,629			
Grains	Corn starch							
Grains	Barley products[b]	140,305,440	4,701,898	4,701,898	20,159,389			
Grains	Oat products	958,753,840	2,430,070,157	2,338,894,031	2,639,557,557			

Continued—

Table B-6

Food Purchases, Consumption, and Consumer Loss Estimates: Grains—continued

Category	Food	Previous consumer loss estimate	Expert average consumer loss	Consumer loss (unadjusted for ingredient percentage)			Ingredient use: expert average	Consumer loss (adjusted for ingredient percentage)			Proposed consumer loss estimate	Explanation
				Nielsen data	Nielsen + Perishables data	Availability data		Nielsen data	Nielsen + Perishables data	Availability data		
Grains	White and whole wheat flour	20%	20%	NC		NC	100%	NC		NC	NA	
Grains	Durum flour	20%	18%	NC		NC	100%	NC		NC	NA	
Grains	Rice	20%	20%	–173%		33%	100%	–273%		–67%	33%	Estimate based on Availability data
Grains	Rye flour	20%	22%	NC		NC	100%	NC		NC	NA	
Grains	Corn flour and meal	20%	16%	NC		NC	100%	NC		NC	NA	
Grains	Corn hominy and grits	20%	16%	–8%		70%	100%	–108%		–30%	NA	
Grains	Corn starch	20%	20%	NC		NC	100%	NC		NC	NA	
Grains	Barley products[b]	20%	19%	77%		97%	83%	–6%		14%	14%	Estimate based on Availability data
Grains	Oat products	20%	18%	11%		–153%	none				14%	Used same estimate as barley products

Note: Consumer-level loss estimates should be positive. Negative consumer-level loss estimates indicate reported consumption exceeds food purchases.

NA = not available.

NC = not calculated.

[a]"ERS Availability" refers to the volume of each food available at the consumer level in the Food Availability data series. The definition of these foods may differ somewhat from how we defined them when obtaining consumption data from NHANES.

[b]Food has 10 or fewer consumption observations in NHANES; thus, the total consumption estimate may not be reliable.

Table B-7

Food Purchases, Consumption, and Consumer Loss Estimates: Added Sugars and Sweeteners

Category	Food	ERS availability[a]	NHANES consumption		Nielsen purchases		Nielsen + Perishables	
			Total (lbs)	Store only (lbs)	All purchases (lbs)	Random-weight only (lbs)	Perishables Group: non-UPC (lbs)	All purchases: Nielsen UPC + Perishables non-UPC (lbs))
Added sugars and sweeteners	Cane and beet sugar	16,018,204,400	607,918,929	509,788,981	2,800,394,593			
Added sugars and sweeteners	High-fructose corn syrup							
Added sugars and sweeteners	Glucose							
Added sugars and sweeteners	Dextrose							
Added sugars and sweeteners	Honey	263,072,700	99,294,956	79,317,182	77,914,937			
Added sugars and sweeteners	Edible syrups	87,690,900	670,246,242	446,622,665	485,100,527			

Continued—

Table B-7

Food Purchases, Consumption, and Consumer Loss Estimates: Added Sugars and Sweeteners—continued

Category	Food	Previous consumer loss estimate	Expert average consumer loss	Consumer loss (unadjusted for ingredient percentage)			Ingredient use: expert average	Consumer loss (adjusted for ingredient percentage)			Proposed consumer loss estimate	Explanation
				Nielsen data	Nielsen + Perishables data	Availability data		Nielsen data	Nielsen + Perishables data	Availability data		
Added sugars and sweeteners	Cane and beet sugar	20%	17%	82%		96%	63%	19%		34%	34%	Estimate based on Availability data
Added sugars and sweeteners	High-fructose corn syrup	20%	15%	NC		NC	100%	NC		NC	15%	Used same value as honey
Added sugars and sweeteners	Glucose	20%	20%	NC		NC	100%	NC		NC	15%	Used same value as honey
Added sugars and sweeteners	Dextrose	20%	20%	NC		NC	100%	NC		NC	15%	Used same value as honey
Added sugars and sweeteners	Honey	20%	21%	–2%		62%	48%	–49%		15%	15%	Estimate based on Availability data
Added sugars and sweeteners	Edible syrups	20%	16%	8%		–664%	88%	–80%		–752%	15%	Used same value as honey

Note: Consumer-level loss estimates should be positive. Negative consumer-level loss estimates indicate reported consumption exceeds food purchases.

NC = not calculated.

[a]"ERS Availability" refers to the volume of each food available at the consumer level in the Food Availability data series. The definition of these foods may differ somewhat from how we defined them when obtaining consumption data from NHANES.

Appendix C: Materials for Consumer-Level Food Loss Expert Panel

Consumer-Level Food Loss Study RTI International

Background Information

Under a grant with USDA's Economic Research Service, RTI International is developing updated estimates of consumer-level food loss that occurs at home and away from home. These estimates will be incorporated into ERS's Food Availability (per capita) Data System[1], which provides important statistical indicators that track food and nutrient availability since 1909 for many commodities. The data facilitate policymaking and regulatory decisions about nutrition education, public health programs, vitamin and mineral fortification, and food labeling. Currently, the Food Availability data series (also known as food supply or food disappearance) are the premiere source of time-series data in the Food Availability Data System. However, the data overstate actual consumption, so ERS has also included an additional series in the system, the Loss-Adjusted Food Availability data, which adjusts the Food Availability data for nonedible food parts and food losses, including losses from farm to retail, at retail, and at the consumer level.

[1]See http://www.ers.usda.gov/data/foodconsumption/foodguideindex.htm.

Purpose of Project

The focus of this project is on updating the consumer-level loss estimates for "cooking loss and uneaten food" of the edible share currently used in the Loss-Adjusted Food Availability data. The goal is to update the consumer-level loss factors, both at home and away from home, for approximately 200 foods. These foods are classified into seven broad categories: meats, poultry, and fish; dairy products; added fats and oils; fruits; vegetables; grain products; and added sugars and sweeteners.

What We Would Need from You

If you agree to participate in the panel, you would need to travel to Research Triangle Park, NC, for a 1-day meeting in May 2008. During the meeting, you will participate in general group discussions and complete worksheets with your estimates of food loss for individual product categories. Preparation prior to that date will include reviewing the product category definitions and description of the process we will use for the meeting.

Potential dates of the panel are listed on Panelist Information Form. If you are selected and able to participate, we will pay you an honorarium and travel expenses.

Activities for the Panel Meeting (specific schedule to be determined):

1. Presentation and overview of the research goals and methods

2. Review and discussion of RTI's calculated estimates of the percentages of foods consumed from purchases at grocery stores versus at restaurants and other foodservice establishments
    - Panelists will be asked to provide revised estimates based on their knowledge of at-home versus away-from-home food consumption choices

3. Review of RTI's calculated estimates of consumer-level food loss to validate whether they are reasonable and whether the relative values for the different food groups are appropriate
    - Panelists will be asked to provide revised estimates based on their knowledge of food purchase, preparation, and consumption practices

4. Discussion of estimates of loss factors for "ingredients" based on the foods in which these ingredients are typically used (focus particularly on frying fats)
    - Panelists will be asked to provide original estimates based on their knowledge of food purchase, preparation, and consumption practices

Qualitative discussion of trends in food purchase and consumption behavior that have likely influenced food loss over time since 1970

RTI International

RTI is an independent, nonprofit research institute based in Research Triangle Park, NC. Established in 1958 as the Research Triangle Institute, RTI has a distinguished history of scientific achievement in the areas of health and pharmaceuticals, education and training, surveys and statistics, advanced technology, democratic governance, economic and social development, energy, and the environment. RTI has ongoing projects in more than 40 countries and a staff of more than 2,600. The Food and Agricultural Policy Research Program at RTI has been conducting analyses of the economic effects of policies affecting the food and agricultural industries for over 20 years.

If you are interested in participating in the panel, please fill out the attached sheet and send it with your resume or CV to:

Michaela Coglaiti
Food and Agricultural Policy Research Program
RTI International
3040 Cornwallis Road
Research Triangle Park, NC 27709-2194
E-mail: coglaiti@rti.org
Phone: 919-990-8498

If you have any questions on the purpose and design of the project, you may contact:

Mary Muth, Ph.D.
Director, Food and Agricultural Policy Research Program
RTI International
3040 Cornwallis Road
Research Triangle Park, NC 27709-2194
E-mail: muth@rti.org
Phone: 919-541-7289

If you have any questions for ERS regarding the project, you may contact:

Jean Buzby, Ph.D.
USDA/Economic Research Service
1800 M Street, NW
Room S2080
Washington DC, 20036-5831
E-mail: jbuzby@ers.usda.gov
Phone: 202-694-5370

Consumer-Level Food Loss Study: Panelist Information

Name: **Phone Number(s):**
Affiliation: **Preferred E-mail Address:**

Please indicate which dates you would be available for a full day meeting (8:30 AM-4:30 PM):

- ☐ Monday, May 12
- ☐ Tuesday, May 13
- ☐ Wednesday, May 14
- ☐ Thursday, May 15
- ☐ Friday, May 16
- ☐ Monday, May 19
- ☐ Tuesday, May 20
- ☐ Wednesday, May 21

With which aspects of food consumption issues are you most familiar based on your research? (Check all that apply.)

- ☐ food purchase behavior
- ☐ food preparation practices at home
- ☐ food preparation practices in restaurants and cafeterias
- ☐ food consumption practices at home
- ☐ food consumption practices away from home
- ☐ food spoilage
- ☐ cooking losses
- ☐ plate loss (or waste)
- ☐ other (please list): _____

With which product types are you most familiar based on your research? (Check all that apply.)

- ☐ meat, poultry, and fish
- ☐ dairy products
- ☐ added fats and oils
- ☐ fruits (fresh and processed)
- ☐ vegetables (fresh and processed)
- ☐ grain-based products
- ☐ added sugars and sweeteners

Please return to Michaela Coglaiti (email to coglaiti@rti.org or fax to 919-541-6683)

After we have received responses from all of the potential panelists, we will schedule the panel event. If you have relevant expertise and are available for the scheduled date, we will contact you to set up a Panel Participant Consulting Contract and assist you with travel arrangements.

Consumer-Level Food Loss Study Expert Panel Members

May 2008

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Consumer-Level Food Loss Study Expert Panel Meeting
Tuesday, May 13, 2008, 8:30-4:30
Hobbs Ground Floor Conference Room, RTI International

8:00-8:30	Arrival and refreshments
8:30-9:15	Introduction and overview presentation Discussion of product categories within each of the following groups: -Meat, Poultry, and Fish (including Eggs) -Nuts -Dairy -Dairy Beverages -Fats and Oils -Fruits -Fruit Juices -Vegetables -Grain Products -Added Sugars and Sweeteners
9:15-10:30	Estimates of purchases, consumption, and consumer loss; meat, poultry, fish, and eggs
10:30-10:45	Break
10:45-12:15	Estimates of purchases, consumption, and consumer loss—nuts, dairy beverages, dairy, fats & oils
12:15-1:00	Lunch
1:00-2:45	Estimates of purchases, consumption, and consumer loss—fruits, fruit juices, vegetables, grains, sugars & sweeteners
2:45-3:00	Break
3:00-3:30	Estimates of consumer-level loss for ingredient products
3:30-4:00	Estimates of food consumed at-home vs. away-from-home
4:00-4:30	Discussion of trends in consumer-level food loss over time and wrap-up
4:30	Adjourn

turning knowledge into practice

Consumer-Level Food Loss Study
Expert Panel Meeting

RTI International
Research Triangle Park, NC

May 13, 2008

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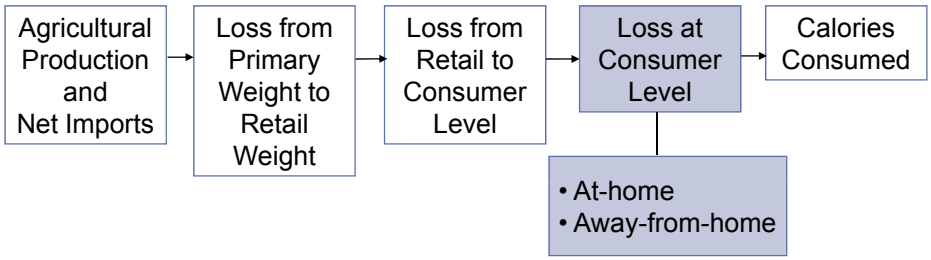
Presentation Outline

- Loss adjustments and definition of consumer-level losses
- Review of literature on consumer-level food loss
- Findings from interviews on losses in restaurants and foodservice
- Method of estimating food loss using existing data
  - Consumer food purchase estimates
  - Consumer food consumption estimates
  - Resulting loss estimates
- Next steps for today

Loss Adjustments for USDA's Food Availability Data



Source: Based on Kantor et al., "Estimating and Addressing America's Food Losses," 1997

Definition of Consumer-Level Food Loss

- Loss that occurs in at-home and away-from-home settings:
  - **At-home** includes purchases at grocery stores, warehouse stores, specialty grocery stores, farmers' markets
  - **Away-from-home** includes restaurants, school and company cafeterias, hospitals, nursing homes, catered events
- Sources of consumer-level losses:
  - Inedible share (e.g., apples cores and chicken bones)
  - Other consumer-level loss—*focus of this study*
    - Cooking and preparation
    - Discarded because of expired use-by or open dates or overpreparation of foods
    - Spoilage
    - Plate waste

Literature Review: Methods of Estimating Consumer-Level Food Loss

Dietary recall	Individuals keep diaries or are interviewed on their food discards
Archeological	Trained observers examine garbage and then estimate or measure food discards
Plate examination	Researchers examine and then estimate or measure plate waste
Inferential	Calculations are made using secondary data on food purchases and food consumption

Sources: Gallo, 1980; Buzby and Guthrie, 2002; Adams et al., 2005

Literature Review: Drawbacks of Estimation Methods

Dietary recall	■ Method is reactive—participants will alter their behavior because they are being observed
Archeological	■ Captures only plate waste and not other losses ■ Misses liquids, foods fed to pets, and foods disposed in garbage disposal ■ Costly and time consuming
Plate examination	■ Captures only plate waste and not other losses ■ Costly and time consuming
Inferential	■ Few datasets are available and their accuracy may be a concern

Sources: Gallo, 1980; Buzby and Guthrie, 2002; Adams et al., 2005

Literature Review: Estimates of Consumer-Level Food Loss (1)

- Kantor et al. (1997 and 1998)
  - 26% of edible food is lost
  - Based on limited published studies and discussions with commodity experts
- Gallo (1980)
  - Stated that previous studies found losses in the range of 7% (dietary recall & archeological methods) to 35% (inferential method)
- van Guarde and Woodburn (1987)
  - 6% of food lost due to poor quality, spoilage, plate waste, etc.
  - Based on 7-day diary and 3-day measurement for 243 households

Literature Review: Estimates of Consumer-Level Food Loss (2)

- Engstrom & Carlsson-Kanyama (2004)
  - 20% of food in foodservice settings is lost (> 50% due to plate loss)
  - Based on visual examination and interviews in restaurants and schools in Sweden
- Buzby & Guthrie (2002)
  - 12% of calories served in school cafeterias lost due to plate waste
  - Based on estimate available from a large, national representative study conducted in 1991-92
- Marlette et al. (2005)
  - 14-36% food loss in schools due to plate waste
  - Based on photographing lunches before and after eating

Literature Review: Factors Affecting Consumer-Level Food Loss

Seasonality	More waste occurs in summer months
Age of children	Younger children waste more than older children
Gender	Females waste more than males
Income	Higher income individuals waste more than lower income individuals
Setting	More waste occurs in hospitals and military mess halls than in school and company cafeterias
Size of household	Larger households waste more than smaller households (likely due to more children)

Sources: Gallo, 1980; Buzby and Guthrie, 2002; Adams et al., 2005; Engstrom and Carlsson-Kanyama, 2004; and van Guarde and Woodburn, 1987)

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Results of Earlier Interviews on Relative Losses in Households versus Foodservice

- **Spoilage loss** of dairy products, fresh fruits, fresh vegetables, and meat, poultry, and fish is likely greater in households.
  - Restaurants/foodservice purchase more frequently and monitor inventories more carefully.
- **Cooking and preparation losses** for meat, poultry, and fish is likely greater in households.
  - Restaurants/foodservice use more pre-portioned and pre-trimmed products.
- **Cooking and preparation losses** for fats and cooking oils is likely greater in restaurants/foodservice due to more frequent use of frying as a cooking method.
- **Plate loss** is likely greater for restaurants and foodservice.
  - Portion sizes are much greater than for households and individuals have less control over portion sizes.

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Estimating Food Loss Using Existing Data

- Compare consumption data to retail purchase data for approximately 200 foods in the Food Availability Data System
  - Method addresses all types of *at-home* losses including spoilage, cooking loss, and plate waste
- Data sources:
  - The Nielsen Company (2004)—retail food purchases from panel of households (does not include foodservice)
    - Subtract inedible portion to determine edible portion of food purchases
  - National Health and Nutrition Examination Survey (NHANES) (2003-2004)—actual consumption based on recall with separate estimates for at-home and away-from-home
  - Both data sources have weights or projection factors to calculate national estimates

Estimating Food Loss Using Existing Data (continued)

- Total purchases (TP) of food from retail (edible portion):

  $$TP = NP \bullet (1 - P\_I)$$

  where

  NP = estimate of purchases from Nielsen Homescan (or possibly, Perishables Group)

  P_I = percentage of food that is inedible
- Note that some purchases might be used as ingredient
- Percentage of consumer-level food loss (P_CFL):

  $$P\_CFL = (TP - NC)/TP$$

  where NC = estimate of at-home consumption from NHANES

Examples of Issues in Applying Numerical Method

- Matching detailed foods in NHANES consumption data with UPC-level data in Homescan purchase data is challenging.
- Foods used only or predominately as ingredients are not readily identifiable in NHANES consumption data.
- Consumption estimates for some foods in NHANES are based on a small number of observations.
- Estimates of the inedible portion of foods needed to be revised and estimated for some categories.
- Fresh foods sold as random weight appear to be under represented in Nielsen Homescan purchase data (e.g., apples).
- Some foods in Nielsen Homescan purchase data are only in counts, not weight of product, or are in unprepared weight.

Process for Estimating Purchase Quantities (1)

- Examined product modules and product descriptions in Homescan for each food category in the Food Availability Data
  - Identified relevant product modules and UPC codes for **foods with UPCs**
    - Excluded baby foods because not reflected in consumption data
    - Combination products with up to 2 foods were split (e.g., frozen peas and carrots)
    - Excluded medleys and combinations with more than 2 foods
  - Identified relevant product modules for **random weight foods**
- Focused on ensuring consistency between purchase and consumption data while adhering to Food Availability Data definitions to the extent possible

Process for Estimating Purchase Quantities (2)

- Types of adjustments to the data
  - Converted count data to weights using average weights in USDA National Nutrient Database for Standard Reference (e.g., apples)
  - Converted liquid volumes to weights = density of item (mass/volume) * volume of item
  - Reduced purchase quantities by inedible (refuse) percentages:
    - USDA National Nutrient Database for fresh fruits & vegetables
    - Food & Agriculture Organization for fish & shellfish
    - Direct measurements for canned products
  - Converted purchase weights to cooked weights for products such as rice, dried beans, and dehydrated potatoes
  - Converted nuts in shell to shelled weight
  - Converted dozens of eggs to weight using average weight for each size egg times 12
  - Converted juice concentrates to equivalent reconstituted weight

Process for Estimating Purchase Quantities (3)

- Types of adjustments to the data (continued)
  - Scaled up purchase quantities for households that had nonparticipating months in Homescan
    - Nielsen's practice is to include households in the data set if they participated in 10 or more months of the year
    - For households that participated in fewer than 12 months, adjusted purchases upward to account for missing months
  - Used Perishables Group data as a supplement to estimate random weight purchase volumes
    - Perishables Group data provide an alternative estimate of random weight purchase volumes for some categories of meat, poultry, fish, fruits, and vegetables
  - In the future, may scale up total purchase quantities based on degree of "under-estimation" identified in a related study comparing Homescan to BLS Consumer Expenditures Survey

Process for Estimating Consumption Quantities (1)

- Identified food categories and descriptions in NHANES for each food category in the Food Availability Data, focusing on consistency with products identified in the Homescan data
- Obtained mean grams of consumption in the population using the first day of the dietary recall data
  - Food purchased in stores
  - Food purchased in restaurants and foodservice
- Multiplied mean grams by the 2004 population: 292,303,000
- Multiplied by 365 days to obtain an annual estimate
- Multiplied by 0.0022046226 to convert from grams to pounds

Process for Estimating Consumption Quantities (2)

- Special Case 1: peanut butter
  - Used mean weight of all the peanut butter products and half the mean weight of all the peanut butter sandwiches; summed both weights
- Special Case 2: fruit juices
  - For combination fruit juices with two juices, calculated half the mean weight (e.g., apple-grape, pineapple-orange) and added it to mean weight for the respective single type juices
- Special Case 3: butter and margarine
  - For butter-margarine products, calculated half the mean weight and added it to the mean weight for butter and for margarine.

Process for Estimating Consumption Quantities (3)

- Special Case 4: fresh, canned, and frozen vegetables
  - NHANES identifies whether vegetables were consumed from fresh, canned, or frozen and thus consumption quantities can be estimated by type
  - Apportioned "not further specified (NFS)" quantities using percentages by use in the Food Availability worksheets (percentages based on fresh weight)
  - Some categories include both apportioned NFS weights and split weights from combination products (e.g., peas and carrots)

Process for Estimating Losses

- Calculated percentage difference between purchase estimate and consumption estimate for each food
  - Some categories such as "other" categories and ingredient foods were infeasible using this method
- Expert panel review of current and new estimates; provide informed guesstimates of actual losses
- Based on available information sources and expert guesstimates, prepare revised estimated for all foods

Next Steps for Today

- Review food categories and definitions
- Review estimates of purchases, consumption, and percentage consumer-level losses (excluding the inedible percentage)
  - Also consider adjustments for portion of food used as an ingredient
- Develop estimates of percentage losses for ingredients
- Review estimates of food consumed at-home versus away from home
- Discuss trends in consumer-level loss since 1970

Discussion: Food Categories and Definitions

- Groupings to be considered:
  - Meat, Poultry, Fish, & Eggs
  - Nuts
  - Dairy
  - Dairy Beverages
  - Fats & Oils
  - Fruits
  - Fruit Juices
  - Vegetables
  - Grain Products
  - Added Sugars and Sweeteners
- Are the definitions suitable for understanding what is contained in each category, or do they need further clarification?

Discussion: Estimates of Consumer-Level Food Loss (and Portion Used as Ingredient)

- What portion of each food would typically be used as an ingredient and therefore not counted in the NHANES consumption estimate?
- For foods with positive consumer-level loss estimates, are the estimates reasonable for what would be expected?
  - Also, consider the revised estimates using Perishables Group data, if available
- What foods are similar enough that we can transfer a reasonable consumer-level loss estimate?
- For foods with negative consumer-level loss estimates, how should we revise the estimate?
- For the remaining foods, what is your best guess for the consumer-level loss estimate?

Discussion: Estimating Loss for Ingredient-only Foods

- What are the most typical foods that each ingredient food is used in (to help us think about possible loss estimate)?
- Can we use a loss estimate from another food category for any of the ingredient foods?
- If a loss estimate is not available, what is your best guess for consumer-level loss across both at-home and away-from-home uses?

Discussion: Estimates of Food-at-Home versus Food Away-from-Home

- Are the estimates of food-at-home percentages using NHANES data reasonable?
- If not, how do we revise the estimates to make them more reasonable?
- Instead of using individual estimates for each food, should we determine a general estimate for similar foods based on the data from NHANES?
- How should we estimate values for foods that could not be estimated using NHANES?

Discussion: Trends in Consumer-Level Food Loss Over Time

- What trends have likely affected the percentages of consumer-level loss since the 1970?
- Would you say consumer-level losses are generally increasing or decreasing since 1970?
- Are the trends likely similar across foods?
- What are your suggestions for estimating trends in consumer-level loss?