FDA Total Diet Study (TDS): Foods and Dietary Exposure Estimation

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We choose foods to be sampled and analyzed in the FDA Total Diet Study (TDS) that are representative of foods in the U.S. population's average diet. The list of foods collected and analyzed for the TDS underwent major revisions in 1991, 2003, and 2018, to reflect changes in what people in the U.S. eat.

The FY2018-FY2020 TDS Food List

We conducted extensive analyses to determine what foods to add and what foods to drop from the FY2018 TDS food list. We examined the levels of nutrients and contaminants in foods using TDS data, to see if there are differences in results for similar foods (for example, beef roast and beef steak), and to determine if it was beneficial to continue sampling each of these foods. In the case of beef, we determined that the TDS results were similar for beef roast and beef steak, and we decided to sample only beef steak beginning in FY2018.

To identify highly-consumed foods to add to the food list and to identify foods with low consumption that could be dropped from the food list, we analyzed data reported in What We Eat in America (WWEIA), the dietary interview portion of the U.S. Centers for Disease Control and Prevention's National Health and Nutrition Examination Survey (NHANES). We also analyzed data on consumption of food ingredients, using the Environmental Protection Agency's (EPA's) Food Commodity Intake Database (FCID).

Examples of foods that we added to the TDS food list include soy milk, almond milk, and kale. Examples of foods that we dropped from the food list due to low consumption include sherbet, rye bread, and liver. Although TDS data show that contaminant levels in liver are relatively high, liver is not consumed in high enough quantities to justify retaining it on the food list. For some foods, we changed the form of the food to be analyzed rather than dropping the food entirely. For example, for foods we found to have greater consumption in the raw form than in the cooked form, we changed the TDS food description and form analyzed from "cooked" to "raw."

We also designated foods as either "national" or "regional." We designated TDS foods with nutrient or contaminant concentrations that may vary by location or by time of year, as "regional" foods; and collected them as part of the regional collections. We designated

foods that are less likely to vary by location or by time of year as “national” foods; and collected them as part of the national collection. Most of the foods we designated as national foods are processed foods. Two examples of national foods are creamy peanut butter and macaroni and cheese prepared from boxed mix.

Using TDS Data to Estimate Dietary Exposures

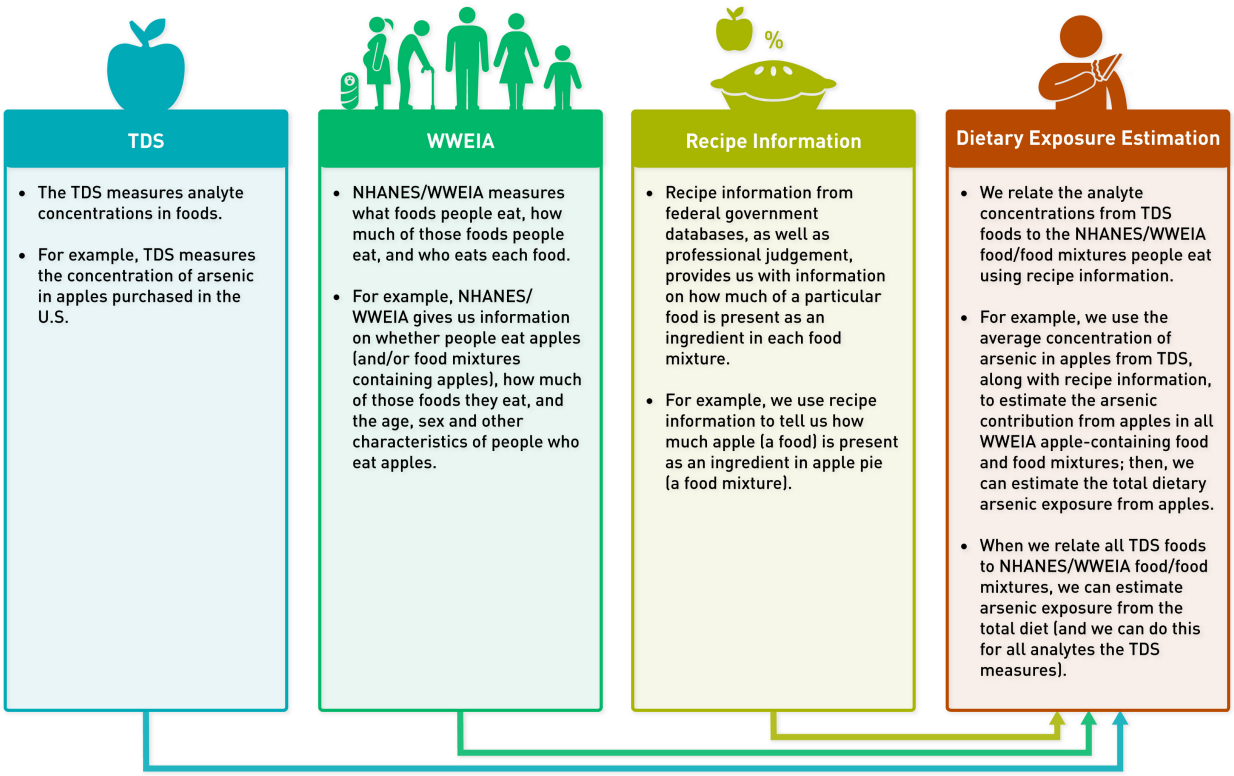
The FDA estimates contaminant exposures from the total diet for various populations based on analyte concentrations in food from TDS, combined with data on food consumption from WWEIA/NHANES. Because TDS cannot realistically collect and analyze the over 8,000 foods reported in WWEIA/NHANES, we have linked WWEIA/NHANES foods to TDS foods. Historically each WWEIA/NHANES food has been linked to one TDS food, and it has been assumed that the analytical value for a single TDS food applies to each of the NHANES/WWEIA foods to which it is linked. In the modernized TDS, we link WWEIA/NHANES food mixtures to TDS data based on proportions of ingredients in the mixtures.

When we updated the TDS food list in FY2018, we included a greater number of single-ingredient items and fewer ingredient mixtures, to allow more accurate calculation of analyte concentrations based on ingredient proportions. The dietary exposure is estimated as the product of the average daily amount of food consumed and the analyte concentration.

WWEIA collects two days of 24-hour dietary data. A 2-day average contaminant exposure is estimated for each WWEIA/NHANES participant as the total of the product of the 2-day average amount of each food consumed and the TDS-based contaminant concentration in that food, for all foods consumed. Average daily TDS-based contaminant exposures are then estimated for WWEIA/NHANES participants in each age- or age and gender-based subpopulation of concern.

With the revised food list and new linking process between WWEIA/NHANES and TDS foods, TDS-based estimates of dietary exposures are likely to be more accurate.

Dietary Exposure Estimation using TDS Data



If you have questions about the FDA Total Diet Study, email TDS@fda.hhs.gov (mailto:TDS@fda.hhs.gov?subject=).

Was this helpful? Yes No