Price, Nutrition, Time, and Other Trade-Offs: A Web-Based Food Value Analysis Application to Compare Foods at Different Levels of Preparation and Processing

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Consumers choose to eat different forms of foods based on a wide variety of factors such as price, taste, nutrition, and convenience and, in doing so, make trade-offs among them. A Web-based application for use by nutrition educators was developed to help individuals compare foods prepared from home recipes with those for other forms of food (eg, frozen, canned, dry mix). Foods with a home-recipe form in US Department of Agriculture databases were selected to represent a range of commonly consumed entrées, baked goods, side dishes, fruits, vegetables, desserts, and beverages. Multiple US Department of Agriculture and commercial databases along with other public data sources were used to construct prices, nutrient values, food groups and components, preparation and cooking times, shelf life, and food safety concerns for foods in the database. Per-serving and per-100-g values were constructed for 100 individual foods with a home recipe and 1 or more other forms. The data are available in a Web-based application, located at http://www.foodvalueanalysis.org, allowing comparisons of individual foods or a daily diet constructed from foods in the database. Nutrition educators can use the application to advise individuals in selecting foods to consume to meet dietary guidelines while taking into consideration cost, preparation time, food preparation skills, and individual preferences. For example, the application can be used to evaluate differences in prices of fresh or processed foods, whether home recipe or processed foods are less costly when taking into consideration the value of preparation time, and the differences in nutrients across different forms of foods. Nutr Today. 2014;49(4):176–184

C onsumers choose to eat different forms of foods based on a wide variety of factors such as price, taste, nutrition, and convenience and, in doing so, make trade-offs among them. Food choices are strongly affected by what a household can afford and whether household members have the necessary food preparation skills to prepare a food from raw or partially prepared ingredients.1,2 In addition, a consumer’s need for foods that are convenient

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and easy to prepare also affects food choices. An increasing portion of the American population lacks confidence in their cooking skills, and many have competing demands that limit time for food preparation.

In the 2010 Dietary Guidelines for Americans, concerns were raised regarding consumption of processed foods because of their excessive sodium, solid fats, refined grains, and added sugars. However, a recent Institute of Medicine report recommended that the US Department of Agriculture (USDA) Food and Nutrition Service recognize the cost-time trade-offs involved in procuring and preparing a nutritious diet when considering the adequacy of the Supplemental Nutrition Assistance Program allotment. In particular, time constraints of households, particularly those with a single working head of household, may lead households to purchase value-added or prepared foods to ensure an adequate diet. Other research has also shown that household time resources significantly affect how much time is allocated to preparing foods and that the total cost of foods in the Thrifty Food Plan are substantially higher when time costs are included in the calculation.

The average American diet is too high in added fats and sugars and falls short in fruits, vegetables, and dairy. Furthermore, many consumers need to change the mix of food groups they consume to better align with dietary guidance. Barriers to adherence with dietary guidance include food preferences, limited food budget, lack of time, and lack of food preparation skills. Lack of cooking skills and eating more foods prepared outside the home are considered barriers to an eating pattern that is consistent with dietary guidance. Data to make objective comparisons across a range of home-received foods and other forms of foods have not previously been available in 1 location. With the availability of government and proprietary databases, comprehensive data on food attributes can be linked for use by nutrition educators in a Web-based application. The Food Value Analysis application, available at www.foodvalueanalysis.org, was designed for use by nutrition educators to help consumers meet dietary guidelines while considering the real and perceived barriers involved in procuring and preparing a nutritious diet. The foods were selected based on whether a home-recipe form of a food is available from USDA databases to avoid subjective judgments about which recipe to use to calculate the values and because nutrients, food groups, and, in many cases, prices could be obtained from existing publicly available data sources and linked by food code. Once foods were selected, food values were calculated as described below. Although other values, such as energy use to prepare foods (kilowatts) or potential food waste, may be of interest, lack of existing data sources at the food code level prevented their inclusion.

Selection of Foods
The foods were selected to represent a range of commonly consumed entrées, entrée components, fruits, vegetables, grains and starches, baked goods, desserts, condiments, and beverages (Table 1). The home-recipe form of a food was selected from the USDA Food and Nutrition Database for Dietary Studies (FNDDS) or the USDA National Nutrient Database for Standard References (SR). In some cases, 2 or more FNDDS or SR codes were used to create a home-recipe form of a food. The processed or prepared forms of foods were selected from the FNDDS, SR, and Gladson Nutrition Database (GND) to match a home-recipe form in the USDA databases. Up to 3 processed forms were included based on the available data. Newer types of processed foods were obtained primarily from the GND. The version of the application described in this article includes 243 foods in 100 categories where each category comprises a home-recipe form and 1 or more other forms.

Data Sources and Calculations
Table 2 provides a list of variables and data sources used in developing the Food Value Analysis application along with key adjustments or calculations. We describe these variables and associated calculations below.

The database contains 100 categories for comparing home recipes and other forms of foods.

Serving Sizes
Serving sizes for foods were selected to be closest to the standard serving sizes defined in the FNDDS or the Reference Amounts Commonly Consumed (RACC). When the FNDDS data are not available in FNDDS or SR, the Gladson Nutrition Database (GND) was used to provide food values. When the values and because nutrients, food groups, and, in many cases, prices could be obtained from existing publicly available data sources and linked by food code. Once foods were selected, food values were calculated as described below. Although other values, such as energy use to prepare foods (kilowatts) or potential food waste, may be of interest, lack of existing data sources at the food code level prevented their inclusion.

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### TABLE 1 Foods to Compare Can Be Selected From the Browse Page of the Food Value Analysis Application

<table>
<thead>
<tr>
<th>Baked Good</th>
<th>Beverage</th>
<th>Condiment</th>
<th>Dessert</th>
<th>Entrée</th>
<th>Entrée Component</th>
<th>Fruit</th>
<th>Grain/Starch</th>
<th>Vegetable</th>
</tr>
</thead>
<tbody>
<tr>
<td>Biscuits</td>
<td>Coffee</td>
<td>Hummus/chickpea dip</td>
<td>Apple pie</td>
<td>Beef mixed dish with broccoli and rice</td>
<td>Chicken broth</td>
<td>Apple slices</td>
<td>Cream of wheat</td>
<td>Baked beans</td>
</tr>
<tr>
<td>Bread: whole wheat</td>
<td>Coffee: sweetened</td>
<td>Salad dressing: Italian</td>
<td>Cake: chocolate</td>
<td>Beef pot pie</td>
<td>Chicken nuggets</td>
<td>Blueberries</td>
<td>Granola</td>
<td>Broccoli: cooked</td>
</tr>
<tr>
<td>Cornbread</td>
<td>Hot chocolate</td>
<td>Salsa</td>
<td>Cherry pie filling</td>
<td>Beef roast</td>
<td>French toast</td>
<td>Peach</td>
<td>Oatmeal</td>
<td>Carrots: cooked</td>
</tr>
<tr>
<td>Dinner rolls</td>
<td>Lemon juice</td>
<td>Cookies: chocolate chip</td>
<td>Beef stew</td>
<td>Gravy: beef or meat</td>
<td>Pineapple</td>
<td>Pasta: plain</td>
<td>Carrots: raw</td>
<td></td>
</tr>
<tr>
<td>Garlic bread</td>
<td>Milk: chocolate</td>
<td>Cookies: oatmeal</td>
<td>Breakfast sandwich: bacon, egg, and cheese</td>
<td>Gravy: poultry</td>
<td>Strawberries</td>
<td>Plain grits</td>
<td>Collards</td>
<td></td>
</tr>
<tr>
<td>Muffin: blueberry</td>
<td>Orange juice</td>
<td>Pie crust</td>
<td>Cheese enchilada</td>
<td>Ham: smoked or cured</td>
<td>Popcorn</td>
<td>Corn</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tea: sweetened</td>
<td>Pudding: chocolate</td>
<td>Cheese pizza</td>
<td>Pancakes</td>
<td>Rice: white</td>
<td>French fries</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Rice Krispies treats</td>
<td>Chicken divan</td>
<td>Pasta sauce: cream-based/Alfredo</td>
<td>Stuffing: bread</td>
<td>Green beans</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Whipped cream</td>
<td>Chicken with vegetables and noodles</td>
<td>Pasta sauce: tomato/red sauce</td>
<td>Green peas</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Chicken with vegetables and rice: Asian style</td>
<td>Pasta sauce: tomato/red sauce with meat</td>
<td>Lettuce: mixed</td>
<td>Mixed, Asian-style vegetables</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Chili with beef and beans</td>
<td>Sausage: pork</td>
<td></td>
<td></td>
<td>Mixed, Asian-style vegetables</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fried fish</td>
<td>Scrambled eggs</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Onion rings</td>
</tr>
<tr>
<td>Gumbo: chicken</td>
<td>Turkey breast: sliced</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Pinto beans</td>
</tr>
<tr>
<td>Hamburger</td>
<td>Waffles</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Pork and beans</td>
</tr>
<tr>
<td>Lasagna: meat</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Potatoes au gratin</td>
</tr>
<tr>
<td>Lasagna: vegetable</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Potatoes: mashed</td>
</tr>
<tr>
<td>Macaroni and cheese</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Potatoes: scalloped</td>
</tr>
<tr>
<td>Meat ravioli</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Refried beans</td>
</tr>
</tbody>
</table>

(continues)
and RACC gram weights for serving sizes differed, the serv-
ing sizes of commercially available products were used as
the basis to select the closest size to the FNDDS serving
size. (For example, the gram weight of a cookie was 14 g in
FNDDS and 30 g for the RACC. Several standard packaged
cookies had serving size weights ranging from 11 to 13 g, so
a 13-g serving size was used for all cookies.) For foods with
clear units (eg, enchilada or stuffed pepper), the standard
unit provided (eg, 1 enchilada or half a stuffed pepper) was
used. For consistency, the serving size of the home-recipe
form was applied across all other forms of the same food.

Home Recipes

All home-recipe forms of foods were obtained from either
the USDA FNDDS (version 5.0) or SR (version 24) data-
bases. In some instances, a combination of FNDDS and SR
data was used to create a home-recipe form of the food
because it was not available within a single code (eg, garlic
bread, meatloaf with mashed potatoes and vegetables, and
cheese pizza). These foods were prepared in a test kitchen,
and the ingredients (eg, French bread, butter, and garlic
powder) were weighed. These individual ingredient weights
were then used to calculate a nutrient profile for the entire
food product using the individual ingredient nutrient profiles.
Recipes were also used to determine preparation and cook-
ing time and to assign food safety concerns and shelf life
(as described below). The FNDDS-SR links file was used to
determine the individual food components in the recipe.
This file lists each individual ingredient for which nutrient
values were used to create the composite nutrient profile
for the FNDDS home-recipe food. If nutrient data for a
food came from the SR file, no recipes were available from
the USDA databases; thus, recipes and numbers of servings
were obtained from "Betty Crocker Cookbook: 1500 Recipes
for the Way You Cook Today," Better Homes and Gardens
New Cookbook, 15th Edition or FoodNetwork.com.18,19
For packaged foods with added ingredients, food labels
were used to determine additional ingredients for assigning
food safety concerns and shelf life.

Nutrients and Daily Values

Nutrient data were obtained from the FNDDS or SR when
available (about 93% of the total foods in the application
and 100% of home-recipe forms) and calculated for the
selected home-recipe serving size. For processed forms of
foods that did not have a food code match in either FNDDS
or SR, composite nutrient data were calculated from the
average of the 3 top-selling products using the GND. How-
ever, only nutrients listed on the Nutrition Facts Panel are
included in the GND.

Daily values (DV) were calculated from the Reference
Daily Intakes, which are based on Recommended Dietary
Allowances (RDAs). Recommended Dietary Allowances
are the established daily dietary intake levels of a nutrient
<table>
<thead>
<tr>
<th>Variables</th>
<th>Sources of Data</th>
<th>Adjustments or Calculations</th>
</tr>
</thead>
<tbody>
<tr>
<td>Serving size</td>
<td>• FNDDS 5.0&lt;br&gt;• RACC&lt;br&gt;• Food packages</td>
<td>• Used serving size of the home-recipe form to standardize values across other forms of the food</td>
</tr>
<tr>
<td>Nutrients</td>
<td>• FNDDS 5.0&lt;br&gt;• SR 24&lt;br&gt;• ERS Nielsen-Gladson merged data</td>
<td>• When using Gladson data, calculated average values for the 3 top-selling products (includes only Nutrition Facts Panel nutrients)</td>
</tr>
<tr>
<td>Food groups</td>
<td>• MPED 2.0&lt;br&gt;• CNPP Addendum to the MPED 2.0</td>
<td>• Included the 7 major food groups plus whole grains, eggs, soy, and nuts and seeds</td>
</tr>
<tr>
<td>Purchase price</td>
<td>• CNPP Food Prices Database&lt;br&gt;• Nielsen Homescan</td>
<td>• When using Homescan data, calculated average prices accounting for added ingredients, refuse losses, and moisture losses and gains&lt;br&gt;• Adjusted to 2011 values using the consumer price index for food at home from the Bureau of Labor Statistics</td>
</tr>
<tr>
<td>Preparation (hands-on) time</td>
<td>• Betty Crocker Cookbook: 1500 Recipes for the Way You Cook Today&lt;br&gt;• Better Homes and Gardens New Cookbook, 15th Edition</td>
<td>• Calculated average or determined most common values across the published recipes</td>
</tr>
<tr>
<td>Cooking time</td>
<td>• FoodNetwork.com’s ‘‘Recipes and Cooking’’</td>
<td>• For foods without times from recipes or product packages, obtained estimates by preparing foods in a test kitchen</td>
</tr>
<tr>
<td>Servings per recipe</td>
<td>• Food packages</td>
<td></td>
</tr>
<tr>
<td>Preparation value</td>
<td>• Calculated value</td>
<td>• Multiplied preparation time by an average hourly wage rate entered by the user; total value for a recipe was divided by the average number of servings in the recipe to obtain a per-serving estimate</td>
</tr>
<tr>
<td>Shelf life</td>
<td>• Cooperative Extension publications from Colorado, Texas, and Virginia&lt;br&gt;• Food packages (use-by or sell-by dates)</td>
<td>• Determined range of values across the published sources</td>
</tr>
<tr>
<td>Food safety</td>
<td>• Partnership for Food Safety Education&lt;br&gt;• Foodsafety.gov&lt;br&gt;• US Department of Agriculture Food Safety and Inspection Service Web site&lt;br&gt;• Food packages (caution statements)</td>
<td>• Developed list of food safety concerns stated in ≥1 of these sources</td>
</tr>
</tbody>
</table>

Abbreviations: CNPP, Center for Nutrition Promotion and Policy; ERS, economic research service; FNDDS, Food and Nutrition Database for Dietary Studies; MPED, MyPyramid Equivalents Database; RACC, reference amounts commonly consumed; SR, standard references.
considered sufficient to meet the requirements of 97.5% of healthy individuals in each life stage and gender group. To calculate the percentage DV, we divided the nutrient value per serving of food by the Reference Daily Intakes and multiplied by 100. Daily values were calculated only for nutrients with an established RDA. Polyunsaturated fat, monounsaturated fat, total sugars, and most micronutrients have no established RDA. Percent DV was not calculated for protein because the US Food and Drug Administration has ruled that scientific evidence suggests that protein intake is not a public health concern.21

Food Groups
Food group data were obtained from the MyPyramid Equivalents Database 2.0 supplemented with the Center for Nutrition Promotion and Policy (CNPP) Addendum to the MyPyramid Equivalents Database, which provides food group data for an additional 820 food codes. (Note: These data were not yet available for the MyPlate system.) From the 7 major food groups available (grains, vegetables, fruits, meats and beans, milk, oils, and extras), data for several important subgroups were also included. Specifically, in addition to total grains, we included whole grains, and from the meat group, we separated eggs, soybean products, and nuts and seeds. Values obtained from these databases were adjusted to the home-recipe serving size for the food.

Food Prices
Food prices were obtained from the USDA CNPP Food Prices Database, 2003–2004, if available for the FNDDS code. If food prices were not available in the CNPP Food Prices Database, national average prices for 2010 were calculated using household purchase data from The Nielsen Company’s Homescan panel, a nationally representative sample of US households. All prices were adjusted to 2011 values using the Bureau of Labor Statistics’ consumer price index for “food at home.”22

Food Preparation and Cooking Time
Food preparation and cooking times for home recipes were obtained using the Betty Crocker Cookbook, Better Homes and Gardens New Cookbook and FoodNetwork.com’s “Recipes and Cooking.”23–25 For foods prepared from packaged foods, preparation and cooking times were obtained from package instructions. If preparation involves opening a package and putting the food in a microwave, preparation time is shown as “minimal” in the application. Because of minor differences across food labels, we developed general assumptions for specific activities based on food package instructions such as 7 minutes for heating a frozen meal, 4 minutes for heating a canned entrée, and 3 minutes for preparing a dry mix with 1 or 2 ingredients. Foods without published preparation and cooking times were prepared in a test kitchen to measure preparation and cooking times. The application displays the assumed method used for cooking or heating the food (eg, microwave vs conventional oven).

Preparation time is assigned a dollar value using an average hourly wage rate entered by the user. We calculated the value of preparation time on the basis of active, hands-on preparation time. Cooking time (eg, baking lasagna in an oven) or other preparation time (eg, soaking dried beans) was not included in the value calculation under the assumption that the food preparer could be engaged in other activities during that time. We first calculated the total time cost of preparing the entire recipe and then divided the total time cost by the number of servings in the recipe. This allows users to view the total value of their time for preparing the entire recipe and the per-serving value of time. By adding the per-serving direct cost to the per-serving value of time, individuals can compare the true total cost of a food across different forms.

Food Safety
Food safety concerns were assigned based primarily on information available from the Partnership for Food Safety Education, FoodSafety.gov, and the USDA Food Safety and Inspection Service. For each ingredient in a food, we identified food safety concerns associated with raw meat; raw poultry; raw fish or shellfish; raw eggs; raw fruits or vegetables prepared without cooking; frozen or refrigerated foods with meat, poultry, fish, or eggs; deli meats; and refrigerated dough. For example, when preparing recipes with raw meat, consumers would need to keep the meat refrigerated or frozen until ready for use, avoid cross-contamination with other foods, and use a thermometer to check internal temperature during cooking. Specific temperatures for refrigeration and cooking are provided for each food with a food safety consideration.

Shelf Life
Shelf life estimates were obtained from Cooperative Extension publications including the Colorado State University...
Cooperative Extension,24 Texas Agricultural Extension Service,25 and Virginia Cooperative Extension.26 For home-recipe foods or processed foods using fresh ingredients, shelf life was determined for the ingredient with the shortest shelf life. Shelf life for packaged foods with no additional ingredients was calculated as the length of time until the use-by or sell-by date as indicated on product labels at a local grocery store. Shelf life was assigned assuming a consumer stores the food in the same form it is in when purchased. For example, we assumed a consumer refrigerates a food that is purchased as a refrigerated food rather than storing the food at room temperature or placing the food in a freezer.

**Web Application Structure and Development**

The Food Value Analysis Web site is structured with the following pages:

- home page—provides an overview and links to use the application
- search page—allows users to search and select a food to display
- browse page—shows all foods organized by type and allows users to select a food to display
- food information page—shows food values for all forms of the selected food
- sources pages—describes and provides links to data sources
- FAQs (frequently asked question) page—provides information on uses, sources, and future plans

Within each broad category of foods shown in Table 1, users can select individual foods to view on the food information page. By default, the home-recipe form of the food is shown on the left, and other forms are shown on the right. The food information page shows the serving size information in common measures and weights. It also allows users to enter an average wage rate for individuals and toggle between values on a per-serving or per-100-g basis. In addition, users can hide or expand the forms of the food displayed and output the selected data to a PDF or Microsoft Excel file. Of the 243 foods in this version of the application, 159 are based on food codes from FNDDS, 58 from SR, 16 from GND, and 10 from a combination of these sources.

**An Example Food Comparison**

The Figure shows an example comparison of home-recipe versus canned meat ravioli on a per-serving basis, defined as one cup. If desired, users can select to view values on a per-100-g basis. Values displayed include economic measures, shelf life of the most perishable ingredient, food safety considerations, nutrients from the Nutrition Facts Panel (with percent DV for nutrients with established DVs), and food group information if available from USDA databases. Users can select to expand the nutrient display to include all nutrients available for the food (limited to those nutrients included in FNDDS). Additional information regarding the values in the display can be viewed at any time by hovering over the adjacent i symbol. Users can submit questions and provide feedback on the application by clicking on a link at the bottom of each page of the Web site.

*The Food Value Analysis application is a tool nutrition educators can use to help consumers make wise decisions.*

**CONCLUSIONS AND FUTURE RESEARCH**

The Food Value Analysis application is designed for use by nutrition educators as they assist consumers in selecting foods for consumption based on individual preferences, budget constraints, time availability, food preparation skills, and shelf life and food safety concerns. The application provides a means to begin a discussion about trade-offs involved in making food choices across multiple dimensions. A key constraint in developing such an application is selecting and obtaining data for a home-recipe version of a food. Although we relied on USDA data for the home recipe, it is important to acknowledge that consumers have access to a wide variety of sources for recipes and frequently adapt recipes (as well as packaged foods with added ingredients) based on their own taste preferences and dietary needs. In particular, they may alter the amount of salt or the type of fat used in a recipe. Also, they may alter the time and cost of preparing a food by using processed or prepared components (eg, by preparing spaghetti and meatballs using pasta sauce in a jar, boxed spaghetti, and frozen meatballs instead of preparing any of these from scratch).

In addition to the values included in the application, other attributes of foods may influence a consumer’s choice of foods such as potential waste, local or organic origins, type of packaging, and energy use for cooking. In some cases, an individual may not have an adequately equipped kitchen or cooking skills required to prepare all forms of a food, thus limiting their choices. Furthermore, the location of grocery stores, availability of transportation, and household schedules influence an individual’s ability to buy and prepare foods. The application does not account for other values that may be of interest because of the inherent difficulty in measuring these values and linking them to each food code.

Foods sold in grocery stores with some degree of preparation or processing may help Americans with limited time or food preparation skills consume a diet that is more consistent with dietary guidance. One nutrient, in particular, however, may prove problematic in light of current food processing formulas and regulatory requirements (such as for ready-to-eat meats). Many processed food
Sample Value Listing for Meat Ravioli

Click to view 100 gram values

Enter a wage rate for use in calculating the value of food preparation time

Click to download summary data as a PDF or Excel file

Time required for hands-on preparation of the recipe divided by the number of servings and multiplied by the selected wage rate

Total cost per serving = purchase price + value of preparation time

Time required to prepare and cook each recipe or single serving

Shelf-life for the most perishable ingredient or food

Food safety concerns to keep in mind for each food form

Hover over any symbol for more detailed explanations of each value

Click here to view more nutrients

If available, food group information for major food groups and components

Click to view the list of ingredients, if available

**Summary Data for Meat ravioli (Entrée)**

<table>
<thead>
<tr>
<th>Value Category</th>
<th>Home recipe</th>
<th>Canned</th>
</tr>
</thead>
</table>

### Economic measures per serving

<p>| | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Purchase price</td>
<td>$1.22</td>
<td>$0.99</td>
</tr>
<tr>
<td>Value of preparation time</td>
<td>$1.27</td>
<td>$0.00</td>
</tr>
<tr>
<td>Total cost</td>
<td>$2.49</td>
<td>$0.99</td>
</tr>
</tbody>
</table>

### Economic measures per recipe

<p>| | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Active preparation time</td>
<td>42 minutes</td>
<td>Minimal</td>
</tr>
<tr>
<td>Value of preparation time</td>
<td>$0.07</td>
<td>$0.20</td>
</tr>
<tr>
<td>Cooking time</td>
<td>68 minutes (conventional)</td>
<td>4 minutes (microwave)</td>
</tr>
<tr>
<td>Total time</td>
<td>100 minutes</td>
<td>4 minutes</td>
</tr>
<tr>
<td>Number of servings</td>
<td>4</td>
<td>2</td>
</tr>
<tr>
<td>Minimum shelf-life</td>
<td>1-2 days (ground meat)</td>
<td>12 months</td>
</tr>
</tbody>
</table>

### Food safety considerations

Recipe with raw meat | None |

**Nutrients per serving (%DV)**

- Energy (kcal): 370 (18.5%) 248 (12.4%)
- Total fat (g): 15.2 (23.3%) 8.8 (13.1%)
- Saturated fat (g): 5 (29.1%) 3.6 (17.8%)
- Polyunsaturated fat (g): 2 | 0.6 |
- Monounsaturated fat (g): 6.4 | 4 |
- Cholesterol (mg): 152.5 (50.8%) 12.5 (4.2%)
- Sodium (mg): 1492.5 (62.2%) 885 (36.3%)
- Potassium (mg): 535 (15.3%) 422.5 (12.1%)
- Carbohydrates (g): 35.6 (11.9%) 34.3 (11.4%)
- Total fiber (g): 2.5 (10%) | 4 (16%) |
- Total sugars (g): 4.4 | 8 |
- Protein (g): 21.9 | 8.5 |
- Vitamin A (mg): 100 (11.1%) 37.5 (4.2%)
- Calcium (mg): 72.5 (7.3%) 32.5 (3.3%)
- Vitamin C (mg): 7 (11.7%) | 0 (0%)
- Iron (mg): 4.7 (26.2%) | 2.6 (14.6%) |

### Food groups per serving

- Total Grain (ounce equivalents): 2.3 | 1.7 |
- Total Vegetables (cup equivalents): 0.6 | 0.4 |
- Total Meat, Poultry, Fish (ounce equivalents): 1.6 | 1.1 |
- Total Egg (ounce equivalents): 0.6 | 0.0 |
- Discretionary Fat, Saturated fat (grams): 9.4 | 3.0 |
- Added Sugars (teaspoon equivalents): 0.1 | 0.8 |
- Database name: FNDDS | FNDDS |
- Database code: 58131320 | 58131323 |
- Food description: Ravioli, meat filled, with tomato sauce or meat sauce | Ravioli, meat filled, with tomato sauce or meat sauce, defined |

Last updated: May 2, 2014 | May 2, 2014

**FIGURE.** Sample value listing for meat ravioli. Reprinted with permission from RTI International.
products, such as bread, processed meats, and sauces, have sodium levels that make it difficult to consume a diet within suggested limits for sodium. However, in some cases, foods formulated to have lower sodium levels can help individuals consume less sodium.

An analysis was recently completed to compare nutrients, costs, and time of example daily diets constructed mainly from foods in the application. Results of this effort provides a broader view of the multiple trade-offs involved in selecting foods on a daily basis. As the USDA data sets are updated over time, the data in the application can be updated. In addition, the foods included in the database can be expanded in cases where a home-recipe version is available from the USDA databases, and alternative forms of foods can be added using the proprietary GND.

REFERENCES