This session is intended to introduce students to a working knowledge of dietary fiber as defined by the Institute of Medicine (IOM) and the data series used to report trends on how much nutrients and other food components are available for consumption, on a per person and per day basis.
## Outline

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Sources of Food Supply Data

Uses of Food Supply Data

The Food Supply and Federal Dietary Guidance

Background on DRIs

Nutrient Values Provided by DRIs
Session Overview for Instructor

Background Information

Audience:
Students in Introductory College Nutrition Classes

Instructional Time:
One Hour

Instructional Slides:
Slides 7-20
Adequate amounts of dietary fiber help to maintain health and reduce risks of colon cancer and coronary artery disease.

Sources of dietary fiber in the U.S. food supply are:
- Grain products
- Vegetables
- Fruits
- Legumes, nuts, and soy
Data on availability of food sources, on a per capita basis, and major food sources for dietary fiber are available from the Nutrient Content of the U.S. Food Supply Series.

Per capita data on dietary fiber from the U.S. Food Supply Series and Estimated Average Requirements (EAR) differ.
A nutritionally adequate food supply has been linked to providing sufficient kilocalories, macronutrients, and micronutrients to meet the nutritional needs of the U.S. population.
The functional properties of dietary fiber have significant protective effects against some chronic diseases.

Eating grains, especially whole grains, provides such health benefits as reduced risk of coronary heart disease and colon cancer.
Dietary fiber (commonly called bulk or roughage) is the edible nondigestible component of carbohydrate and lignin naturally found in plant food;* however, bacteria in the lower gut may metabolize part of it. Major sources of dietary fiber include cereal bran, sweet potatoes, and legumes.

Total Fiber = Dietary Fiber + Functional (or added) Fiber (Excluded: fiber-like products, either extracted or synthesized, that do not have proven health benefits.)

*IOM definition.
Functional fiber consists of isolated, nondigestible carbohydrates that have beneficial physiological effects in humans.*

Example: pectin extracted from citrus peel and used as a gel that is the basis for jams and jellies.

*IOM definition.
Soluble and insoluble dietary fibers are generally found together in foods. However, some foods are better sources of one type than of the other.

- Soluble dietary fiber is digestible.
- Insoluble dietary fiber is nondigestible.
Benefits and Sources of Soluble Fiber

- Soluble fiber attracts water and turns to gel during digestion, thus slowing digestion.

- Research shows that soluble fiber lowers cholesterol (important in the prevention of heart disease) and delays glucose absorption (important in glucose control).

Oat bran, barley, beans, and lentils are primary sources of soluble fiber.
Benefits and Sources of Insoluble Fiber

- Insoluble fiber appears to speed the passage of foods through the stomach and intestines.

- Insoluble fiber adds bulk to the stool, reducing the incidence of constipation.

Wheat bran, vegetables, and whole grains are primary sources of insoluble fiber.
# Daily Recommendations of Dietary Fiber Needed* by Age/Gender

*Recommendations, in grams, are based on Estimated Average Requirements (EARs).

<table>
<thead>
<tr>
<th>Years</th>
<th>Grams</th>
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<tbody>
<tr>
<td>1-3</td>
<td>19</td>
<td>9-13</td>
<td>31</td>
<td>9-18</td>
<td>26</td>
</tr>
<tr>
<td>4-8</td>
<td>25</td>
<td>14-50</td>
<td>38</td>
<td>19-50</td>
<td>25</td>
</tr>
<tr>
<td></td>
<td></td>
<td>51+</td>
<td>30</td>
<td>51+</td>
<td>21</td>
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</table>
The Nutrient Content of the U.S. Food Supply Series . . .

- Is a historical series of data reflecting the availability of food in the U.S. food supply.
- Includes information, since 1909, on the amount of nutrients available for consumption.
- Reports data on a per person and per day basis.
Percentage Difference Between Age/Gender-Weighted Recommendations and Per Capita Grams of Fiber Available for Consumption

<table>
<thead>
<tr>
<th>Year</th>
<th>EAR Weighted data (grams of dietary fiber)</th>
<th>Food supply data (per capita per day grams of dietary fiber)</th>
<th>% Difference</th>
</tr>
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<tbody>
<tr>
<td>1995</td>
<td>28</td>
<td>24</td>
<td>14</td>
</tr>
<tr>
<td>1996</td>
<td>30</td>
<td>25</td>
<td>17</td>
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<tr>
<td>1997</td>
<td>28</td>
<td>25</td>
<td>11</td>
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<tr>
<td>1998</td>
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<td>1999</td>
<td>30</td>
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<td>17</td>
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<tr>
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<td>28</td>
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<tr>
<td>2001</td>
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<td>2002</td>
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<td>2003</td>
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<tr>
<td>2004</td>
<td>28</td>
<td>25</td>
<td>11</td>
</tr>
<tr>
<td>2005</td>
<td>28</td>
<td>25</td>
<td>11</td>
</tr>
</tbody>
</table>
13%: The average difference between the EAR-weighted data on dietary fiber and the U.S. food supply data on dietary fiber.

- When dietary fiber data from the U.S. Food Supply Series and EAR recommendations are compared, the EAR data should be weighted because the recommendations are based on age and gender.
Major Sources of Dietary Fiber in the U.S. Food Supply, 1995 vs. 2005

1995
- Legumes, Nuts, Soy: 11
- Grain Products: 28
- Fruits: 11
- Vegetables: 14
- Other Foods: 36

2005
- Legumes, Nuts, Soy: 11
- Grain Products: 25
- Fruits: 11
- Vegetables: 15
- Other Foods: 36
Contributions of grains to dietary fiber were stable at 36 percent; contributions of vegetables decreased from 28 to 25 percent.

Contributions of legumes, nuts, and soy to dietary fiber were stable: 14 and 13 percent; as were the contributions of fruits: 11 percent.

Contributions to dietary fiber by other foods increased from 11 to 15 percent. These contributions came from spices, cocoa, tea, and coffee. Meat, fish, poultry; dairy; eggs; fats and oils; and sugars and sweeteners contributed no dietary fiber.
Underreporting of whole wheat and breakfast cereals affects the estimates on the dietary fiber that is available for consumption.

Because of underreporting, estimates on the amount of dietary fiber available for consumption may actually be closer to the EAR recommendations.
Nutrient data from the U.S. Food Supply Series are useful in terms of evaluating the effects of technological and marketing changes on the food supply over time.
Supplemental Information

To Learn More About the U.S. Food Supply

- Review and download the Food Supply reports.
- Research nutrients of interest by using the Interactive Food Supply.

Visit [www.cnpp.usda.gov](http://www.cnpp.usda.gov)
## Sources of Food Supply Data

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<th>Economic Research Service provides</th>
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<td>● Per capita estimates of food commodities available for consumption</td>
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### Sources of Food Supply Data

#### Other Sources

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Supplemental Information

Uses of the U.S. Food Supply Data

- To address questions relating to historical trends, suppliers’ response to demand, and establishing food and nutrient policy.

- To examine historical trends and evaluate changes in the American diet and to make international comparisons.

- To examine relationships among food supplies, diet, and health.
Data in the U.S. Food Supply Series are important to policymakers for translating nutrient goals for Americans into goals for food production and supply levels.

To ensure that sufficient nutrients are available to the whole population, the nutrient levels in the food supply need to exceed recommended allowances because the estimates reflect the amount available before losses from trimming, cooking, plate waste, and spoilage.
The Institute of Medicine of the National Academy of Sciences publishes the Dietary Reference Intakes (DRI) for dietary components, including macronutrients, vitamins, minerals, and fiber. The DRIs consist of the RDAs, EARs, AIs, and ULs.

Recommended values are provided for each life cycle group—from birth through childhood, sexual maturity, midlife, and old age.
Nutrient Values Provided by the Dietary Reference Intakes

- **Recommended Dietary Allowance (RDA)**
The average daily intake level sufficient to meet the nutrient requirements of 97 to 98 percent of healthy individuals.

- **Tolerable Upper Level (UL)**
The highest level of daily nutrient intake that is likely to pose no risks of adverse health effects to almost all individuals in the general population.
Estimated Average Requirement (EAR)
The nutrient intake value sufficient to meet the requirements of half the healthy individuals in a group. The Nutrient Content of the U.S. Food Supply Series uses this DRI for nutrient comparisons.

Adequate Intake (AI)
The recommended daily intake based on approximations of nutrient intake by a group (or groups) of healthy people. It is used when the RDA cannot be determined.
