

# USDA's Food Guide Pyramid Database

Linda E. Cleveland  
Food Surveys Research Group  
Agricultural Research Service  
U.S. Department of Agriculture

# Food Guide Pyramid

...a guide to healthful eating



## The Goal

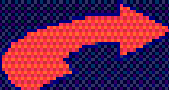
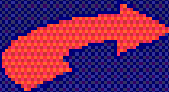
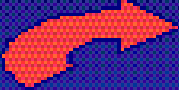
Develop a database for converting food intake data into servings as defined by the Pyramid so intakes could be compared to food-based recommendations

# The Problem

Food intake data could not be compared to Pyramid recommendations because...

- Data were in grams, but...  
recommendations were in servings
- Many Pyramid foods are consumed as ingredients in mixtures

# Method for Developing Pyramid Servings Database

-  Separate foods into ingredients that fit into Pyramid food groups
-  Determine serving weights for foods or ingredients
-  Calculate number of servings from Pyramid food groups in 100 grams of each food reported in survey

# Example of Multi-level Recipe File...

...used to separate foods into ingredients\*

Food Reported	Ingredients		
<b>Beef Barbecue on Bun (code 27510110)</b>	LEVEL 1	LEVEL 2	LEVEL 3
	<div style="display: flex; flex-direction: column; align-items: center;"> <div style="margin-bottom: 10px;">→ <b>ground beef, cooked**</b></div> <div style="margin-bottom: 10px;">→ <b>hamburger roll</b></div> <div>→ <b>barbecue sauce</b></div> </div>	<div style="display: flex; flex-direction: column; align-items: center;"> <div style="margin-bottom: 10px;">→ <b>flour</b></div> <div style="margin-bottom: 10px;">→ <b>milk solids</b></div> <div style="margin-bottom: 10px;">→ <b>sugar</b></div> <div style="margin-bottom: 10px;">→ <b>shortening</b></div> <div style="margin-bottom: 10px;">→ <b>catsup</b></div> <div style="margin-bottom: 10px;">→ <b>brown sugar</b></div> <div>→ <b>onions</b></div> </div>	<div style="display: flex; flex-direction: column; align-items: center;"> <div style="margin-bottom: 10px;">→ <b>tomato sauce</b></div> <div>→ <b>sugar</b></div> </div>

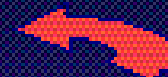
\* Recipes are generic estimates of what people consume.

\*\* Red indicates level at which ingredient was assigned serving weight and categorized in Pyramid food group.

## Example from Food Coding Database... ...the source of weights for servings

### 51000200 Roll, NS as to major flour

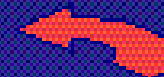
1 pan, dinner, or small roll	28 gm
1 medium (2-1/2" dia)	36 gm
1 hamburger, large....	43 gm



*Pyramid counts a small roll as a grain serving (i.e., 28 grams)*

### 75221011 Onions, mature, ckd from fresh...

1 cup	210 gm
1 medium slice (1/8")	12 gm
1 large slice (1/4")...	32 gm



*Pyramid counts 1/2 cup as a vegetable serving (i.e., 105 grams)*

# Pyramid Servings Database

- Data on number of servings per 100 grams
- 30 food groups
- 6,000 foods used in CSFII 1994-96

## Example: Beef Barbecue on Bun (code 27510110)

Total grain	Total veg	Tomato	Meat (oz)	Discretionary fat (g)	Added sugars (tsp)
1.32	.09	.05	.85	4.14	1.39

*Servings per 100 grams  
(A beef barbecue on bun weighs 186 grams)*

## How many Pyramid servings are in a beef barbecue on bun?

Since it weighs 186 grams, multiply servings per 100 grams by 1.86 to find that it has...

- 2-1/2 grain servings... from bun
- 1/6 vegetable serving... from onions & tomato sauce
- 1-5/8 ounces cooked lean meat... from ground beef
- 8 grams of discretionary fat... from ground beef
- 2-/12 tsp of added sugars... from roll & barbecue sauce

## How Were Grain Servings Defined?

- Use basic Pyramid definition
  - yeast breads... 1 slice bread, 1 small roll, 1/2 bagel
  - muffins... 1 small muffin
  - rice, pasta... 1/2 cup cooked
  - cereals (grain ingredient; not fruits & nuts)... 1 oz
- Calculate number of servings based on grain content (16 g of flour = 1 serving -- amount in 1 slice of bread)
  - snack-type grains (ex: cracker, pretzel, corn chip)
  - dessert-type grains (ex: cookie, cake, pie crust)
  - batter, breading, thickener

## How were servings of whole grains and nonwhole grains determined?

- Classify grain ingredients as whole- or nonwhole-grain
- Determine total grain servings per 100 grams
- Divide total servings based on proportion of grain ingredients that were whole- and nonwhole-grain

Ex: CRACKED WHEAT BREAD      4.0 servings per 100 grams

67%    white wheat flour      2.7 servings nonwhole grain

33%    whole wheat flour  
          wheat bran      1.3 servings whole grain

## How Were Vegetable Servings Defined?

- Use basic Pyramid definition...  
1 cup raw leafy; 1/2 cup cooked; 3/4 cup juice
- Potato chips... 1 ounce  
(same carbohydrate as 1/2 cup baked potato)

## How Were Fruit Servings Defined?

- Use basic Pyramid definition
  - 1/2 cup chopped, cooked, canned fruit
  - 1/4 cup dried fruit
  - 3/4 cup fruit juice  
(single strength or <10% sugar by weight)
- Juices >10% sugar by weight, drinks, ades...
  - separated into ingredients
  - servings based on fruit ingredients only

## How Were Dairy Servings Defined?

- Milk, yogurt: Use Pyramid definition... 1 cup
- Cheese: Use concept underlying Pyramid definition
  - ounces to provide ~300 mg calcium
  - most were 1, 1-1/2, or 2 ounces per serving
- Ice cream, frozen yogurt, custard, pudding
  - handle as mixtures & separate into ingredients
  - servings based on quantity of milk ingredient
- Dairy ingredients counted toward dairy servings except milk in grain products and processed meats

## How Were Meat Servings Defined?

- Use Pyramid definition... ounces of cooked lean meat equivalents
  - meat, poultry, fish
  - eggs
  - nuts, seeds
  - soy analogs, tofu
- Definition: Cooked lean meat contains no more than 9.35 grams of fat and at least 90.65 grams of lean in 100 grams
- Fat in excess of this ratio was counted toward Pyramid tip

## The Pyramid Tip...

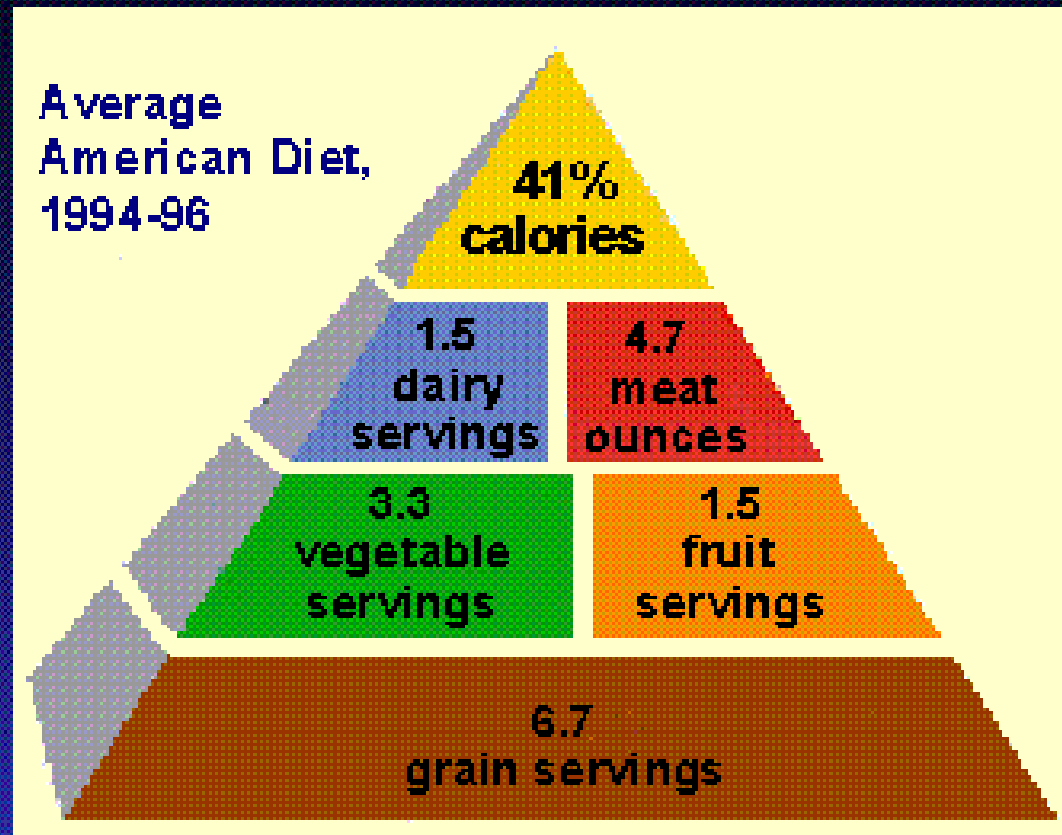
### Discretionary fat includes--

- "excess" fat from major food groups beyond amount that would be consumed if only the lowest fat forms of foods within each group were eaten
- fat ingredients in prepared foods
- fats added to foods at the table

### Added sugars include--

- sugars used as ingredients in processed and prepared foods, such as cakes, soft drinks, jam
- sugars eaten separately or added at table

# American Diet Compared to Food Guide Pyramid Recommendations



## Recommendation<sup>†</sup>

Tip... ~25% kcal<sup>††</sup>

Dairy... 2-3

Meat... 5-7 oz

Vegetable... 3-5

Fruit... 2-4

Grain... 6-11

<sup>†</sup> In daily servings from dairy, vegetable, fruit, and grain groups and ounces from meat group.

<sup>††</sup> Includes discretionary fat and added sugars.

Source: USDA, Continuing Survey of Food Intakes by Individuals, 1994-96, 2-day average, individuals 2 years and over

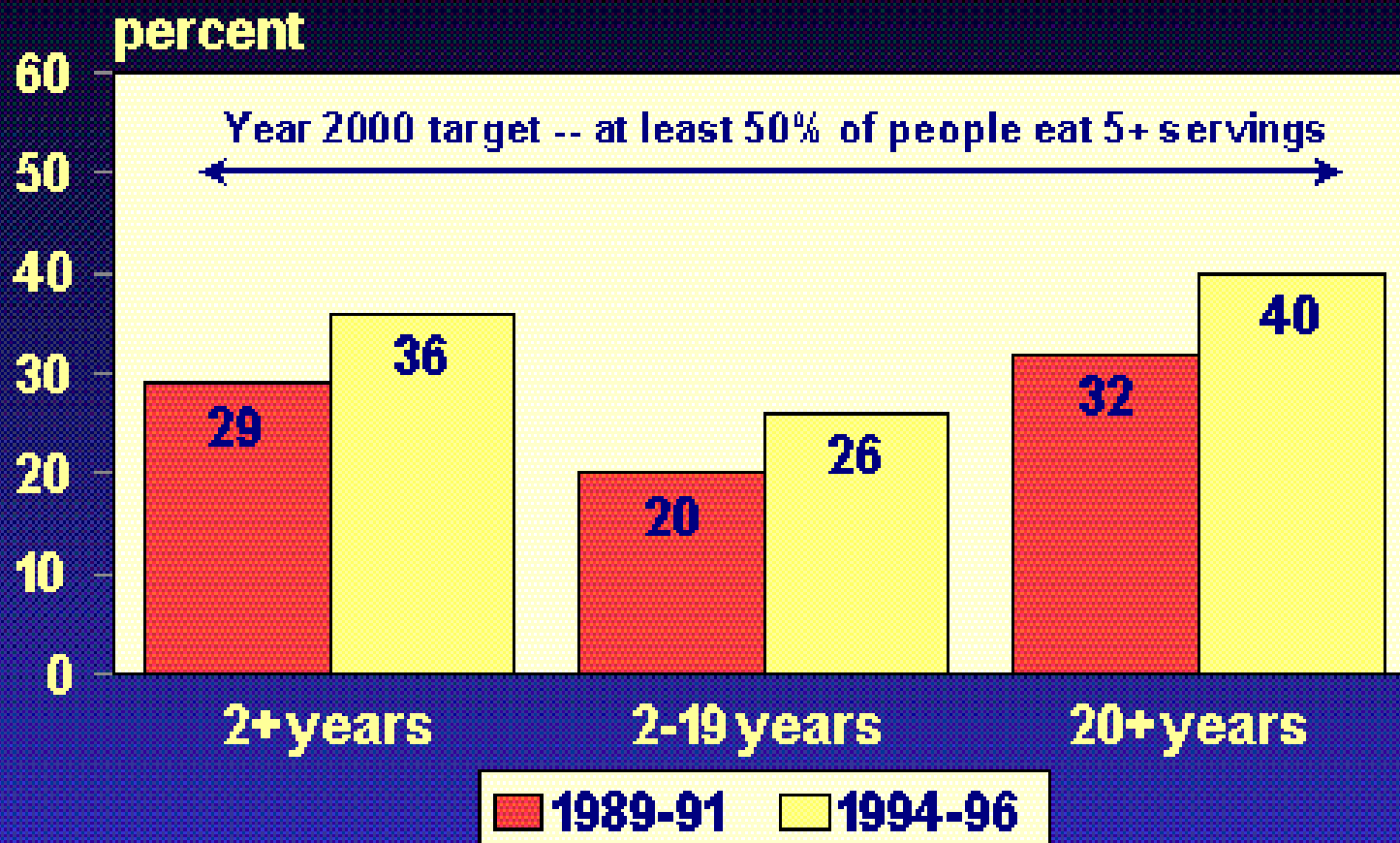
## Percentage Meeting Pyramid Recommendations, 1994-96

<b>Food Group</b>	<b>Percent of Population</b>
<b>Grain</b>	<b>38</b>
<b>Vegetable</b>	<b>41</b>
<b>Fruit</b>	<b>23</b>
<b>Dairy</b>	<b>23</b>
<b>Meat</b>	<b>32</b>

Source: USDA, Continuing Survey of Food Intakes by Individuals, 1994-96, 2-day average, individuals 2 years and over

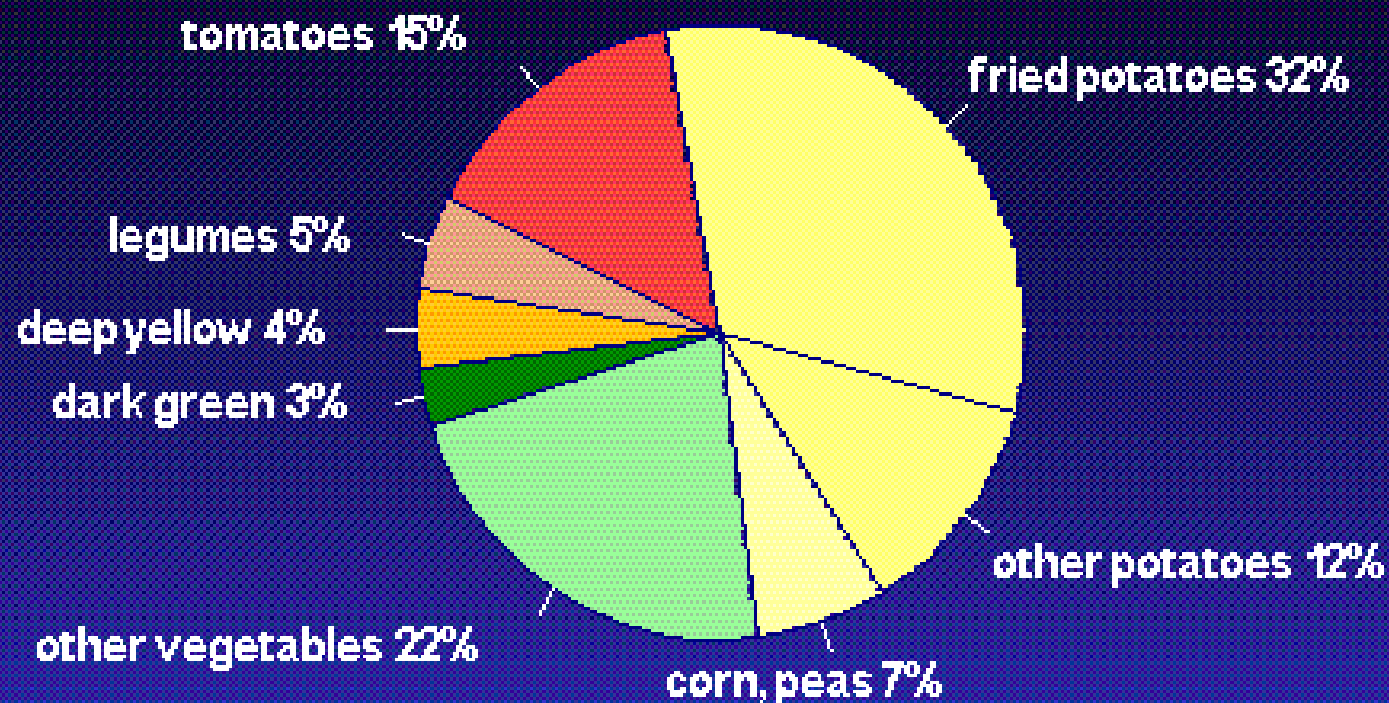
# Trends in Fruit and Vegetable Intake

## Percentage with 5 or more daily servings by age



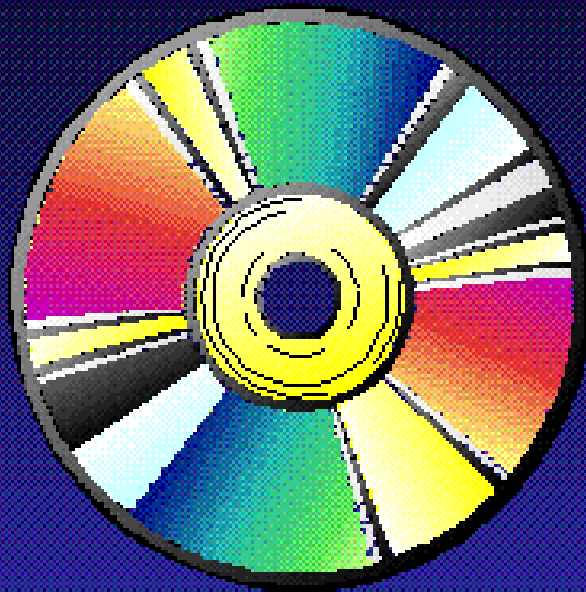
Source: USDA, Continuing Survey of Food Intakes by Individuals, 1994-96, 2-day average, individuals 2 years and over

# Proportion of Vegetable Servings Children and Teens 2-19 years



Source: USDA, Continuing Survey of Food Intakes by Individuals, 1994-96, 2-day average

## 1994-96 Pyramid Servings Database and Intake Files Available on CD-ROM



- Pyramid servings
- Food & nutrient Intakes
- Eating occasion
- Source of food
- Health-related behaviors
- Dietary knowledge & attitudes

World Wide Web Site:

<http://www.barc.usda.gov/bhnrc/foodsurvey/home.htm>