

Module 2

Nutrition Basics

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You Are What You Eat!



Nutrition is a science that studies interactions between the body & food

Foods provide energy and nutrients

Energy is measured in Kilocalories (Kcal) or Calories

Essential nutrients must be provided by diet (the body cannot make them)



6 Categories of Nutrients



- **Carbohydrate**
- **Fat**
- **Protein**
- **Vitamins**
- **Minerals**
- **Water**



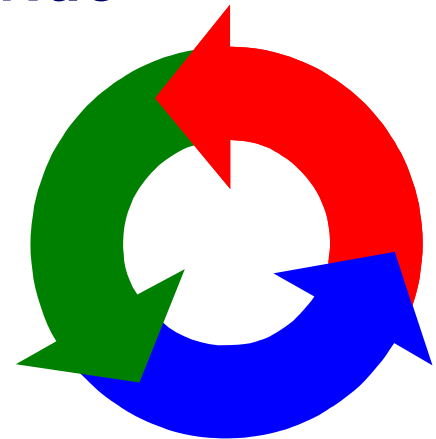
Grosvenor MB, Smolin LA. *Visualizing Nutrition-Everyday Choices*. Wiley. 2010.



Energy



- ***Energy (Calories) are supplied by:***
 - ***Carbohydrates- 4 kcals per gram***
 - ***Protein- 4 kcals per gram***
 - ***Fat- 9 kcals per gram***
 - ***Alcohol- although not a nutrient, does yield 7 kcals per gram***
- ****Vitamins/minerals/caffeine do NOT provide energy***





Carbohydrates: 45-65% of Diet



- **Essential for recovery from activity!**
- **Preferred source of energy for the body:**

➤ **muscles**

➤ **brain**

- **Optimal food sources**

➤ **Fresh fruits, whole grains: oatmeal, brown rice, bran, low fat milk & yogurt, starchy vegetables: peas, corn, squash, & potatoes**

***Choose whole grain products**

A good serving should provide ≥ 3 grams of fiber





Fats: 20-35% of Diet



- **Part of cell membranes**
 - **Insulates the body from heat loss**
 - **Cushions/protects organs**
 - **Provides essential fatty acids for growth, skin and hair**
 - **Transports fat-soluble vitamins (A,D,E,K)**
 - **Food Sources**
 - **Nuts, seeds, nut butters, olive oil, canola oil, & fish**
- *Choose mono- and poly-unsaturated fats and Omega-3 Fatty Acids.**

NOT PARTIALLY HYDROGENATED, TRANS OR SATURATED FATS!!!





Limit These Fats



- **Saturated fat**
 - 15-25 grams of each day
- ***Trans* fat or partially-hydrogenated fat**
 - World Health Organization recommends less than 1 gram of *trans* fat per 1000 calories
- **Less than 200-300 mg of cholesterol each day**





Protein: 10-35% of Diet



- **Essential for recovering from exercise**
 - **Responsible for building and repairing cells**
 - **Excess protein does NOT enhance strength or endurance**
 - **Food Sources**
 - **Milk, cheese products, lean meats, eggs, beans, nuts, and seeds**
- **Choose low-fat dairy**

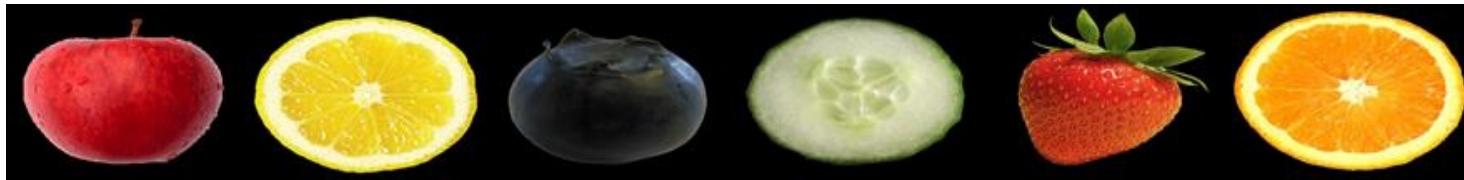




Vitamins & Minerals



- **At any age, the body requires a variety of both for:**
 - **Normal function**
 - **Growth**
 - **Maintenance of body tissue**
- **Minimally processed fruits, vegetables, and whole grains provide best sources.**

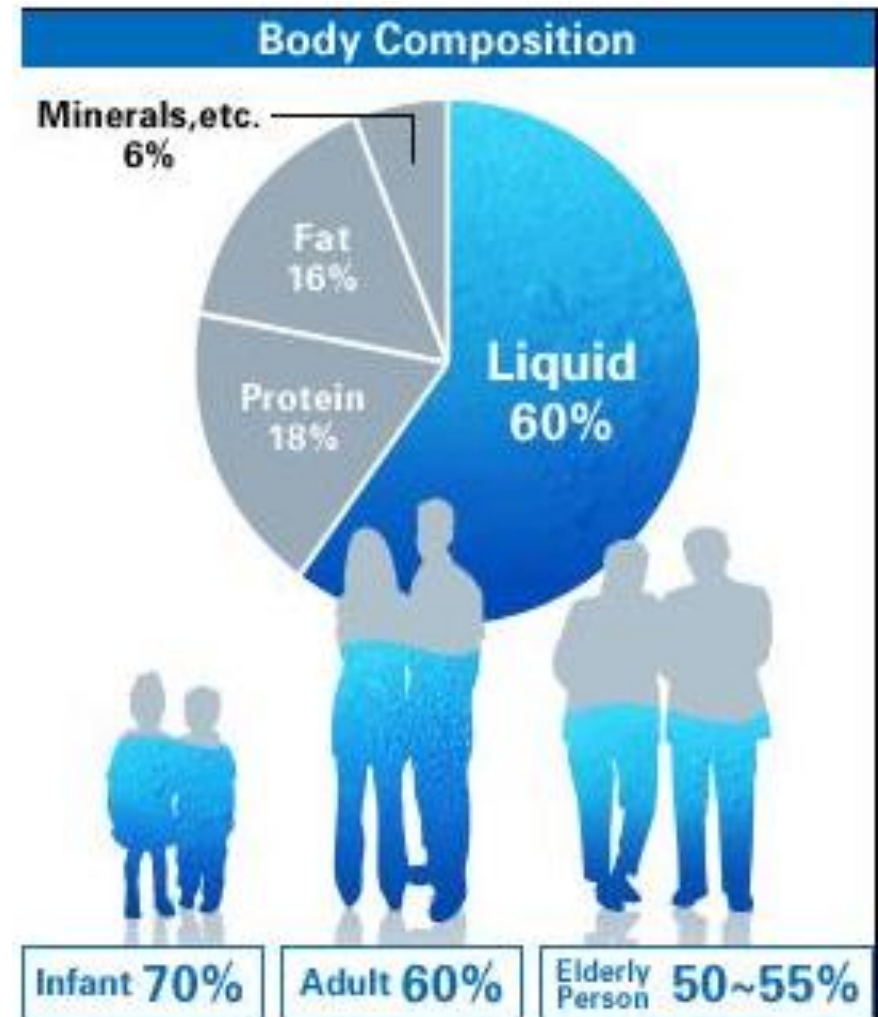




Water



- **Most critical nutrient**
 - We can only go 2-4 days without it!
- **Functions include:**
 - **Transport Vehicle**
 - *Oxygen, CO2, & nutrients*
 - **Lubricates, cleans, & flushes out cells**
 - **Regulates body temperature**





How Much Do You Need?



- **Depends on a variety of factors**
 - **Physical activity**
 - **Environment (i.e. climate & altitude)**
 - **Illness or health conditions**
 - **Alcohol & excess caffeinated drinks (coffee, tea, & soda) dehydrate the body**
- **Simple Guideline**
 - **Drink at least ½ body weight in fluid oz**
 - **Ex: 200 pound individual → 100 oz of water**



Visualizing 100 oz Water



Five 20 oz bottles



or

3 canteens



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What about Alcohol?



- Although not a nutrient, provides **7kcal/gram**
- Interferes with bodies utilization of nutrients
- Inhibits appetite and displaces intake of nutrient dense foods
- Even moderate amounts (1-2 alcoholic drinks) can negatively impact
 - Motor performance
 - Strength and power output
 - Aerobic performance
 - Hydration status

ACSM Fact sheet on Alcohol & Athletic Performance

<http://www.acsm.org/access-public-information/brochures-fact-sheets/fact-sheets>



What is 1 Alcoholic Drink?



**12 fl oz of
regular beer**

=

**8–9 fl oz of
malt liquor
(shown in a
12 oz glass)**

=

**5 fl oz of
table wine**

=

**1.5 fl oz shot of
80-proof spirits**
("hard liquor"—
whiskey, gin, rum,
vodka, tequila, etc.)



about 5%
alcohol



about 7%
alcohol



about 12%
alcohol



about 40%
alcohol

The percent of "pure" alcohol, expressed here as alcohol by volume (alc/vol), varies by beverage.



Alcohol Increases Calorie Intake



In 2013, study indicates males take in an additional 400 calories, while females consume 300 additional calories when drinking alcohol.

Diets of drinkers on drinking and nondrinking days: NHANES 2003–2008. Am J Clin Nutr. May 2013, 97(5)



Navy Pilots' Work Performance After Alcohol Consumption



Yesavage J., & Leirer V. Hangover effects on aircraft pilots 14 hours after alcohol ingestion: a preliminary report. Am J Psychiatry. 1986

- **10 US Navy pilots were tested 14 hours post BAC (blood alcohol content) of 0.1 g/dl**

Results

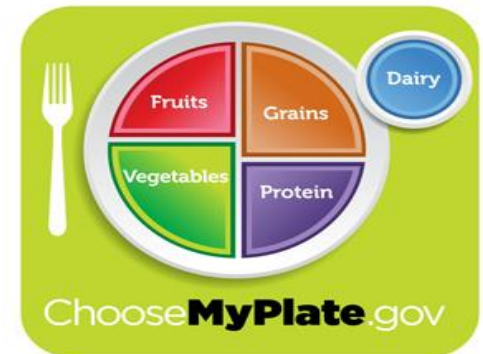
- **Pilot performance was worse in the hangover condition on virtually all measures**
- **They were *significantly worse on three of six measures**
- **The results indicate that caution should be exercised when piloting an aircraft 14 hours or less after ingesting similar quantities of alcohol**



Healthy People 2020 Goals



- In December 2010, the Department of Health and Human Services launched Healthy People 2020, which has four overarching goals:
- Attain high-quality, longer lives free of preventable disease, disability, injury, and premature death;
- Achieve health equity, eliminate disparities, and improve the health of all groups;
- Create social and physical environments that promote good health for all; and
- Promote quality of life, healthy development, and healthy behaviors across all life stages.



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Choose a Food Group

MyPlate illustrates the five food groups that are the building blocks for a healthy diet using a familiar image—a place setting for a meal. Before you eat, think about what goes on your plate or in your cup or bowl. To learn more about building a healthy plate, select a food group below.

Fruits

Focus on fruits.

>> [See Fruit Group](#)



Vegetables

Vary your veggies.

>> [See Vegetable Group](#)



Grains

Make at least half your grains whole.

>> [See Grains Group](#)



Protein Foods

Go lean with protein.

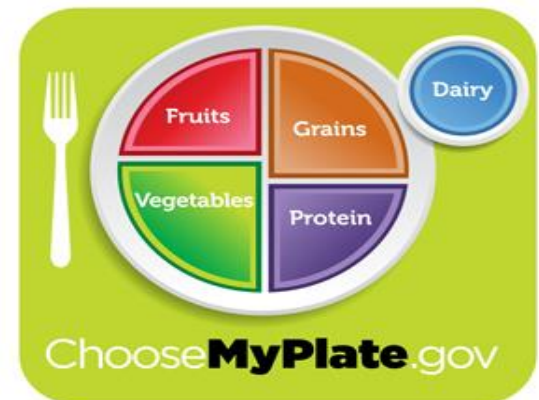
>> [See Protein Foods Group](#)



Dairy

Get your calcium-rich foods.

>> [See Dairy Group](#)



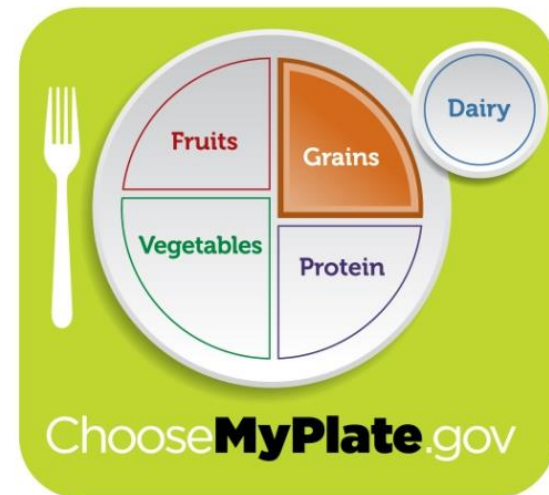


Grains



- Any food made from wheat, rice, oats, cornmeal, barley or another cereal grain is a grain product

- Bread
- Pasta
- Rice
- Oatmeal
- Breakfast cereals
- Tortillas
- Grits

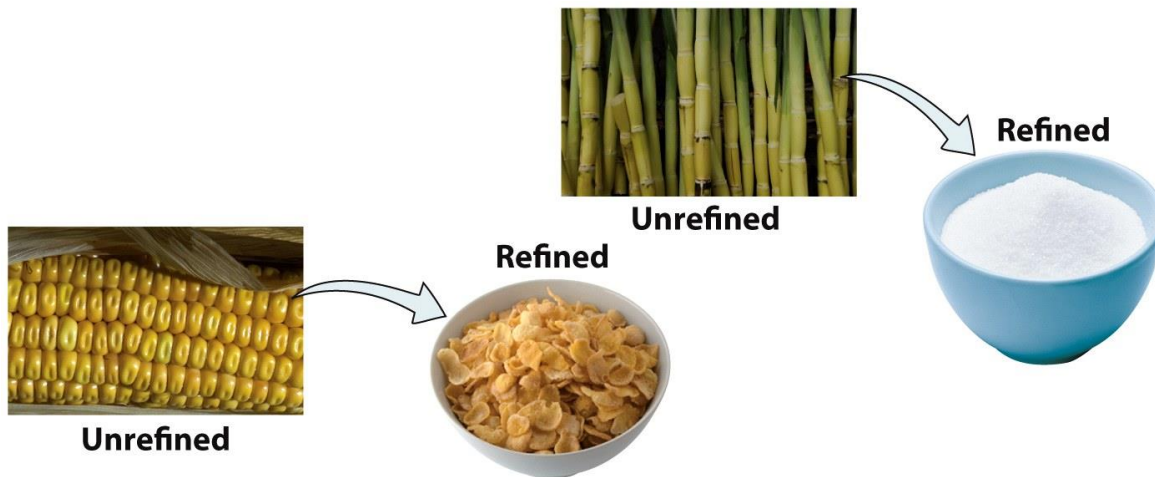




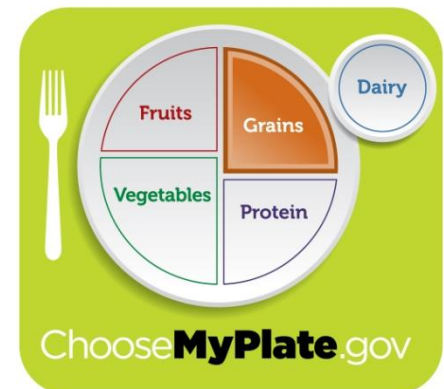
Grains



- **Grains are divided into 2 subgroups**
 - Whole grains
 - Refined grains
- **Refined grains have been milled**
 - Milling removes the bran and germ
 - Gives grains a finer texture and improve their shelf life



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- **Whole grains contain the entire grain kernel**
 - **Bran**
 - **Germ**
 - **Endosperm**

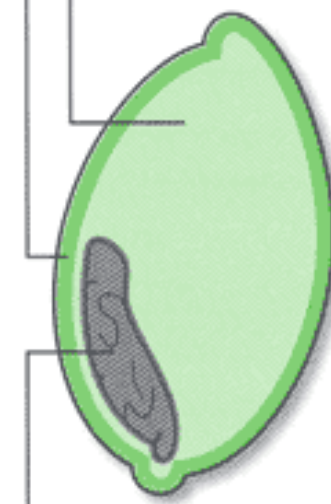
Whole grain kernel

Bran

"Outer shell" protects seed
Fiber, B vitamins, trace minerals

Endosperm

Provides energy
Carbohydrates, protein



Germ

Nourishment for the seed
Antioxidants, vitamin E, B vitamins



Identify Whole Grains



**EAT 48g OR MORE OF
WHOLE GRAINS DAILY**

**The product may
contain some
refined grain.**

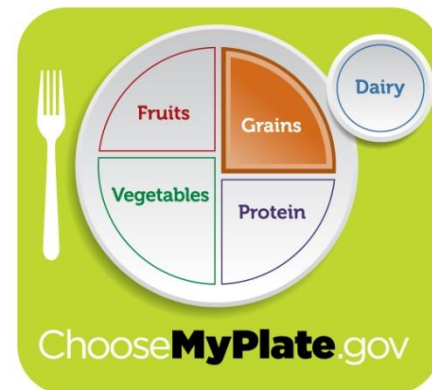
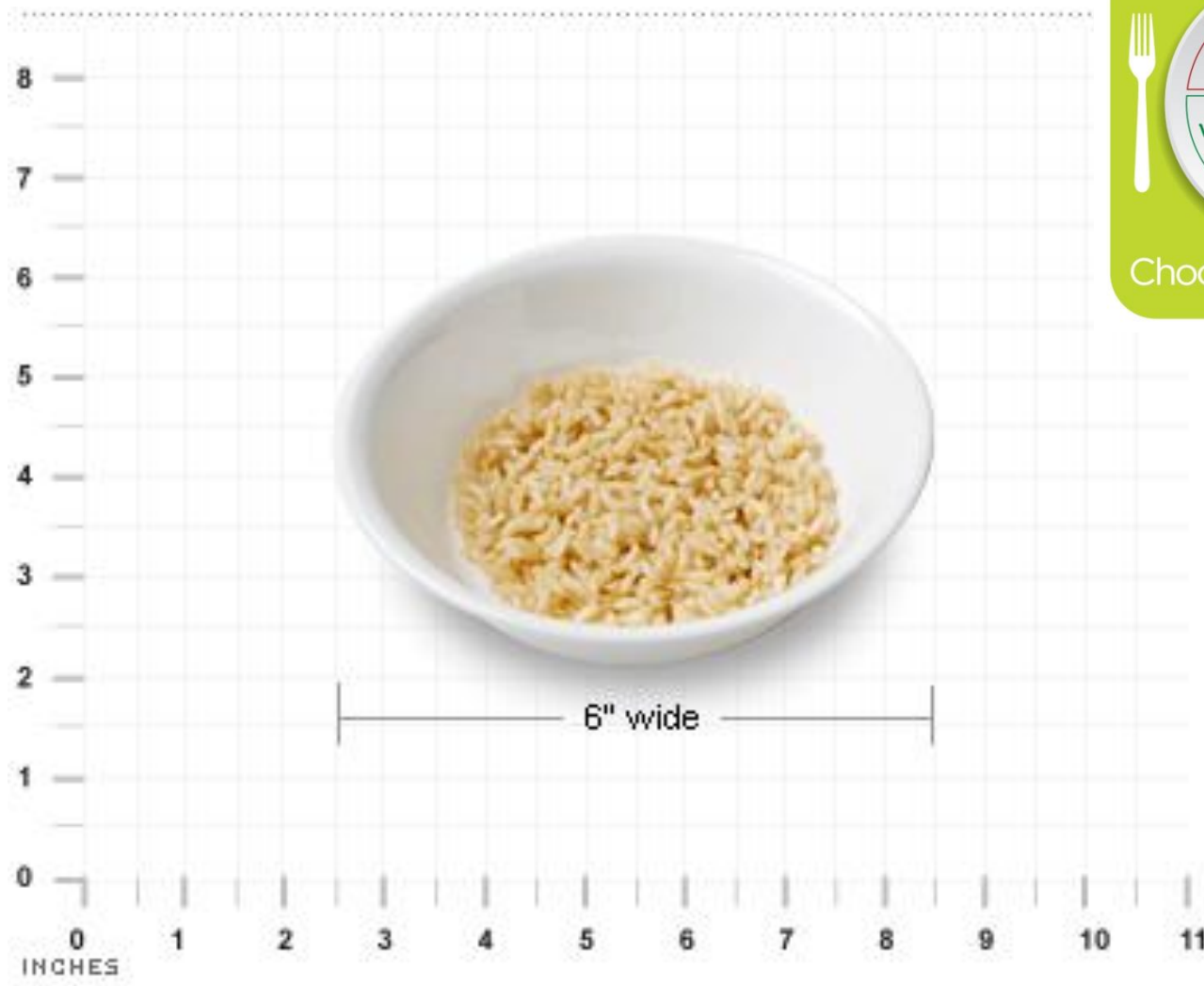


**EAT 48g OR MORE OF
WHOLE GRAINS DAILY**

**All grain ingredients
are whole grains**



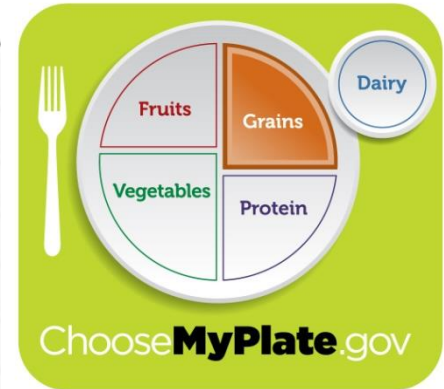
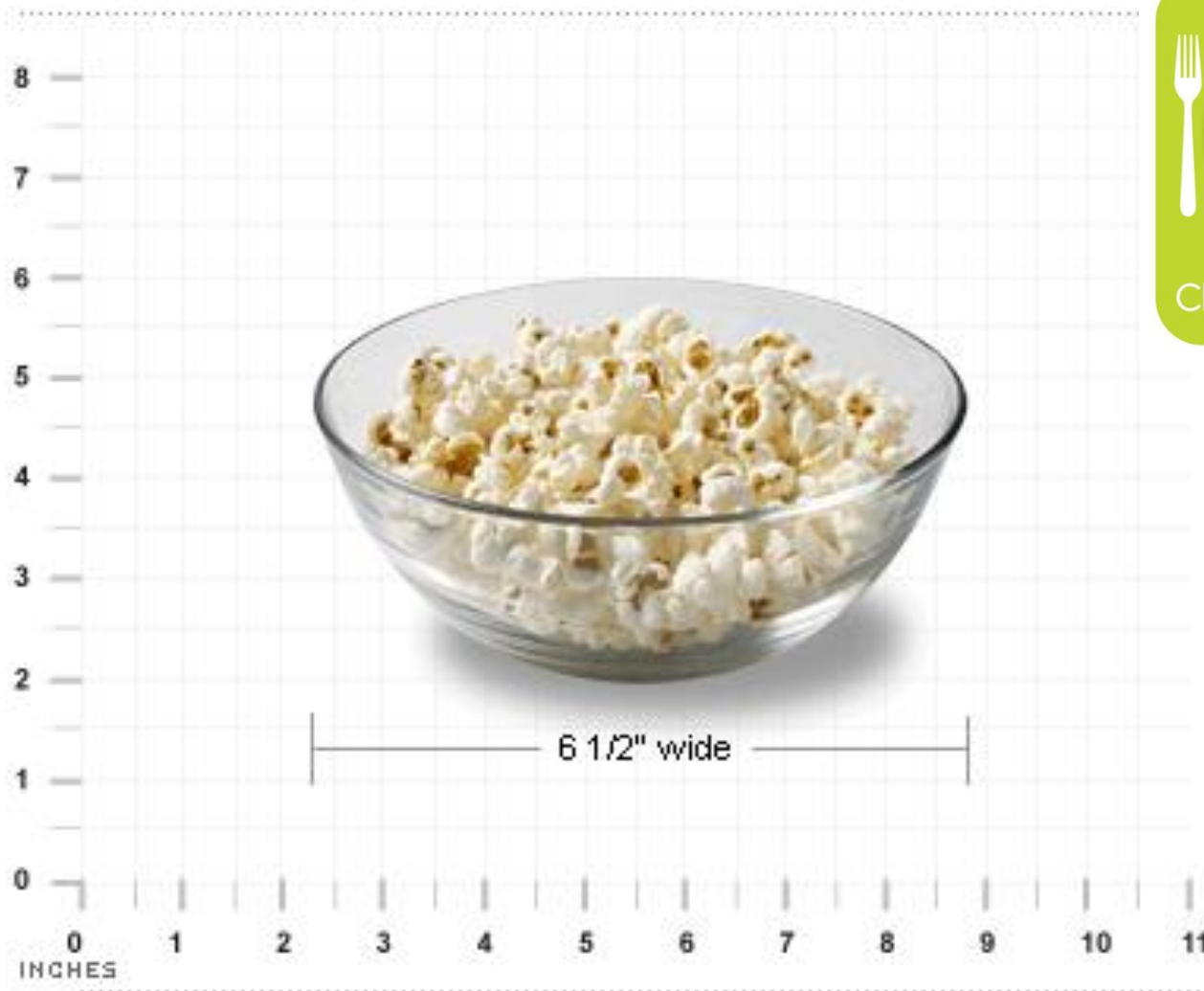
Grain: $\frac{1}{2}$ Cup



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Grains: 3 Cups



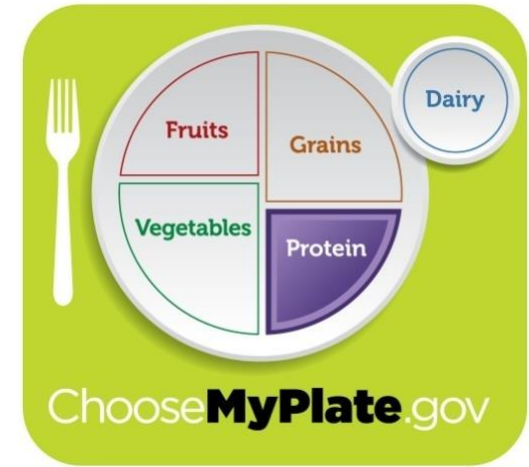
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Protein Foods



- **Meat**
- **Poultry**
- **Seafood**
- **Beans or peas**
- **Eggs**
- **Soy products**
- **Nuts and seeds**



***Beans and peas are part of the
vegetable group, too!***

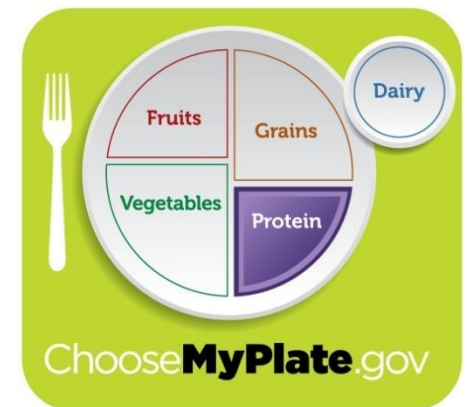
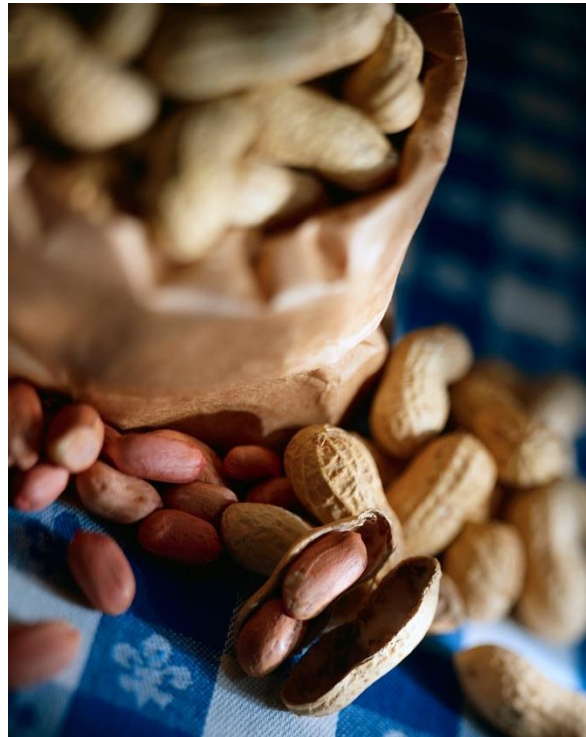


Protein Foods



- **Meat and poultry choices should be lean or low-fat or contain healthy fats**

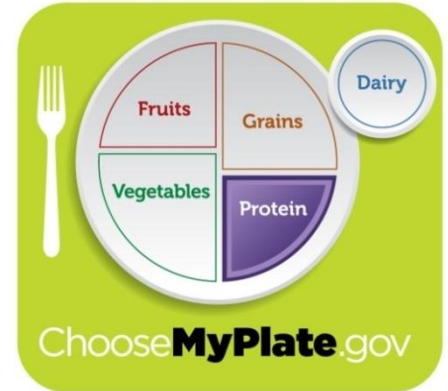
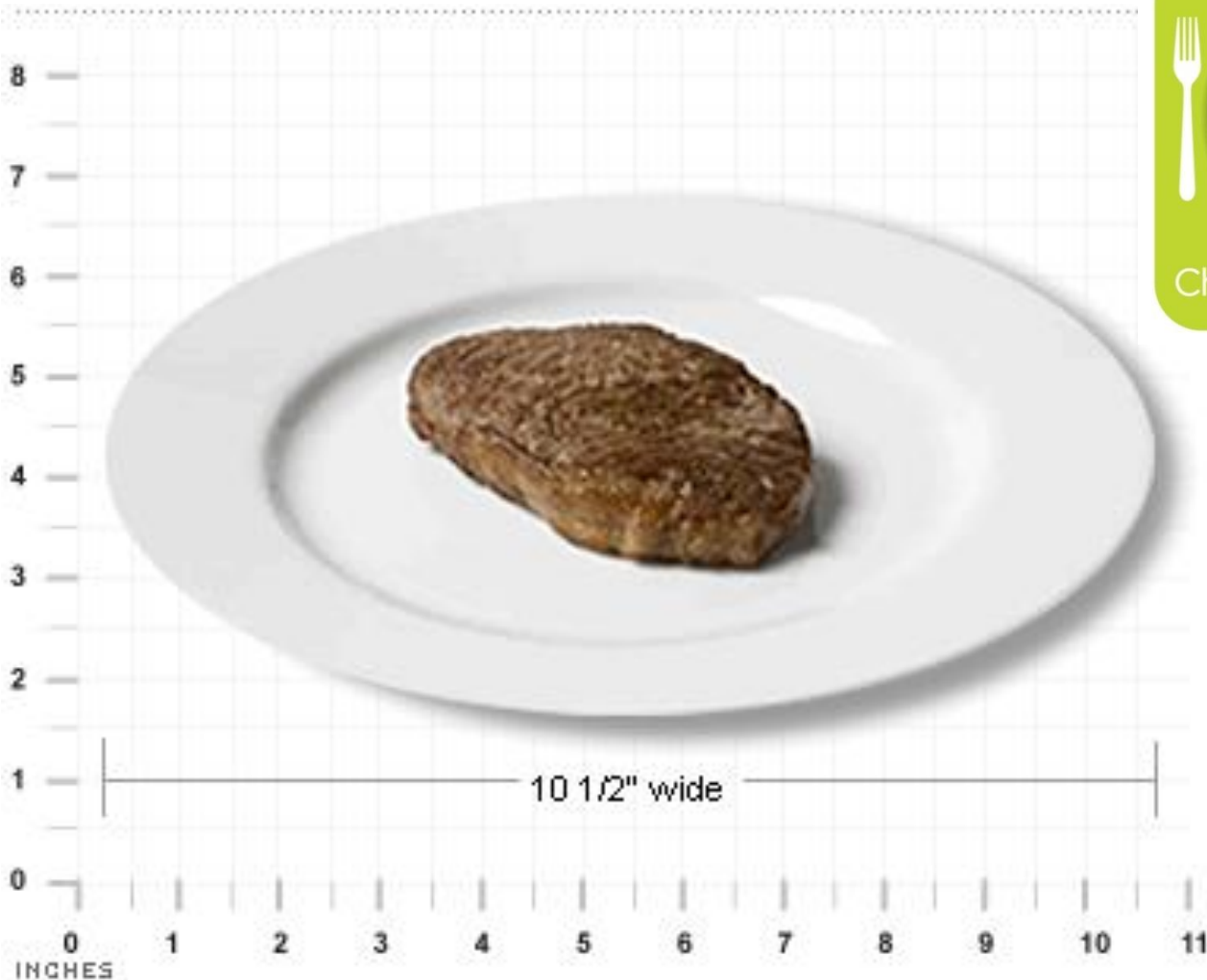
- **Lean meat**
- **Fish**
- **Beans**
- **Nuts**
- **Seeds**



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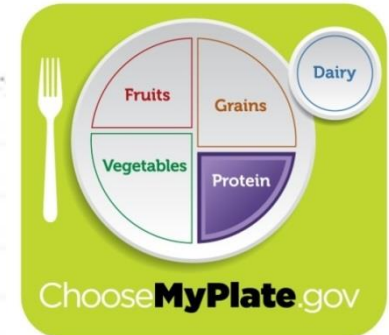
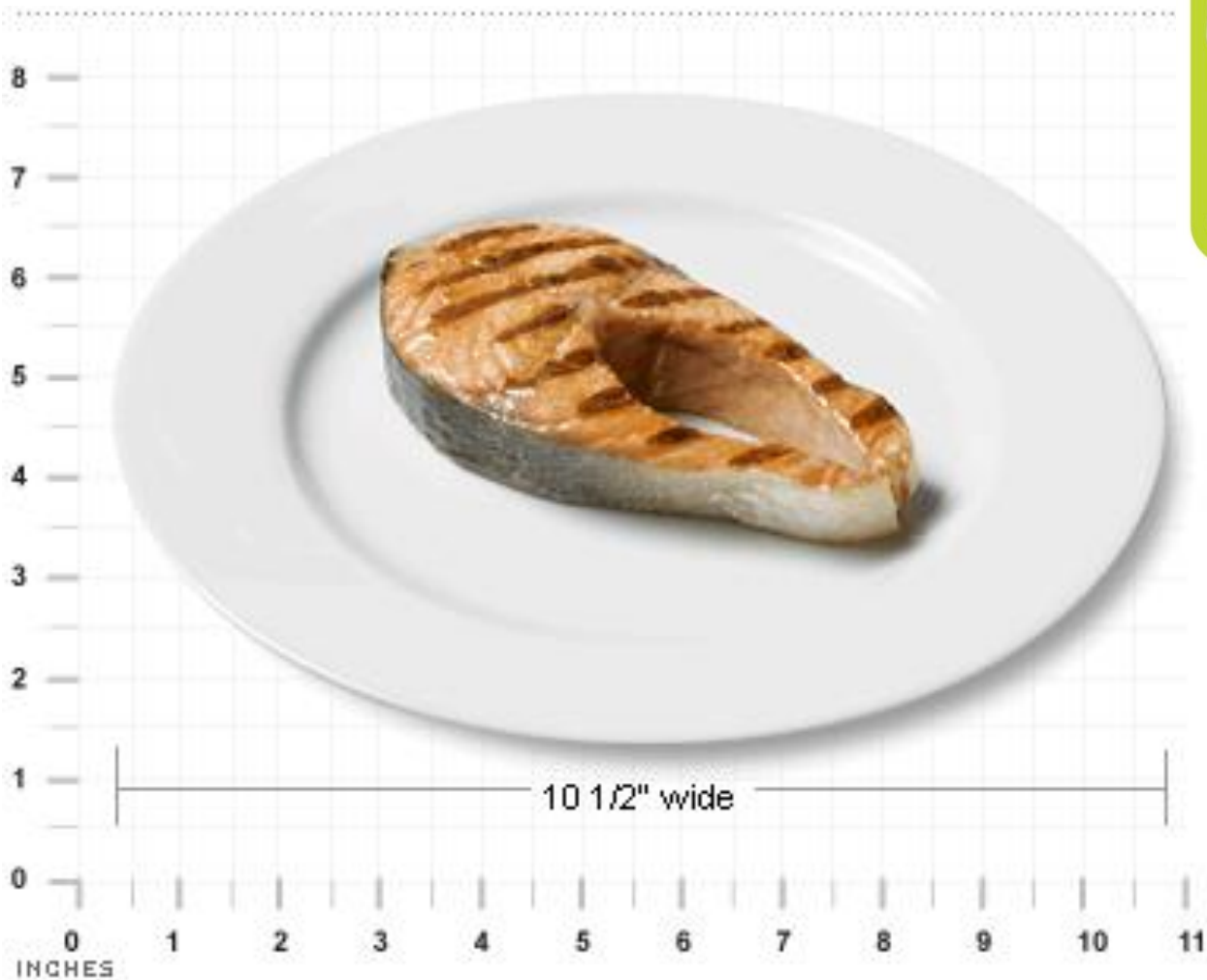
Protein Foods: 5 oz



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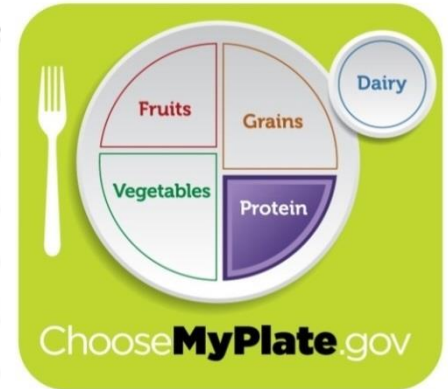
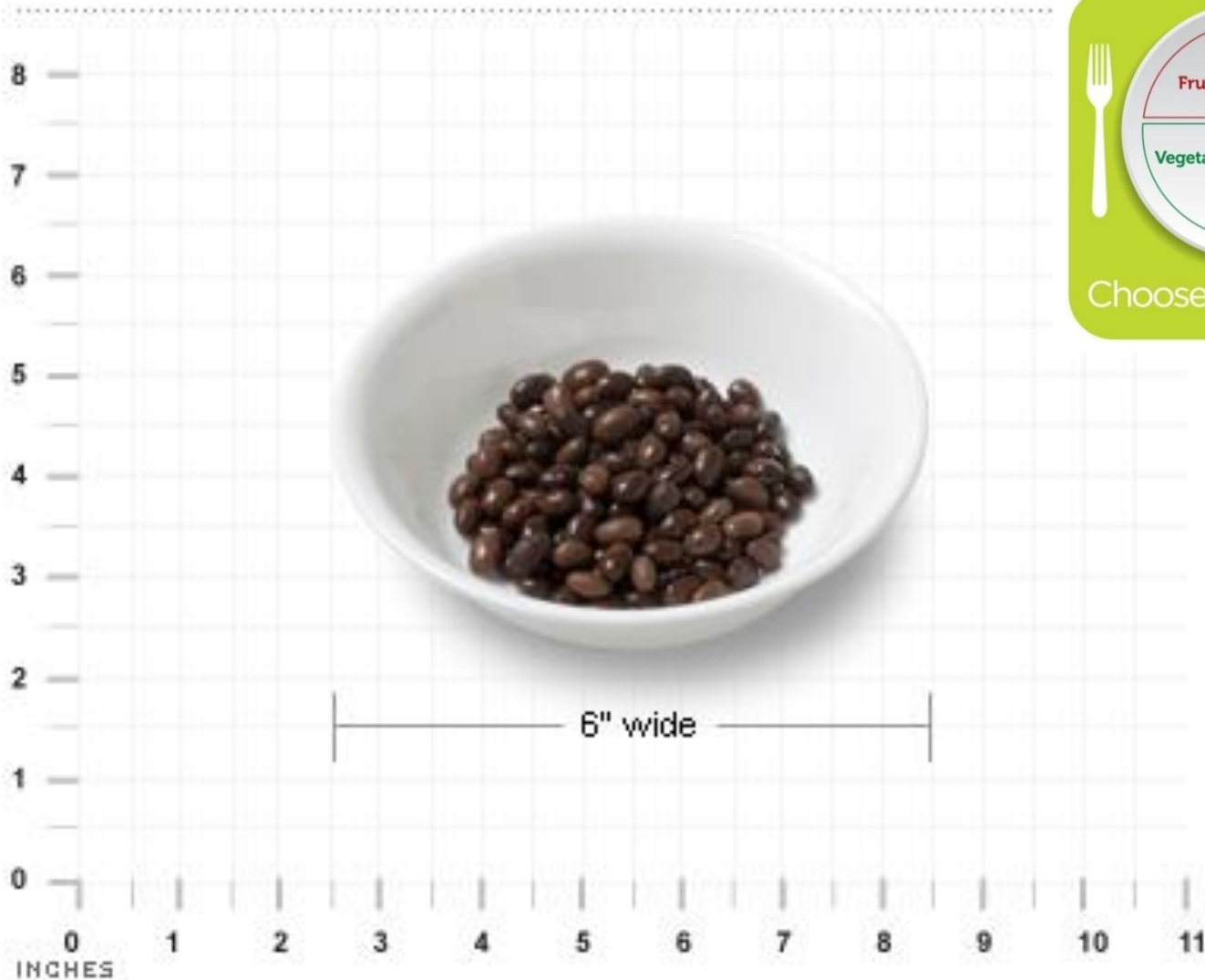
Protein Foods: 8 oz



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Protein Foods: $\frac{1}{2}$ Cup



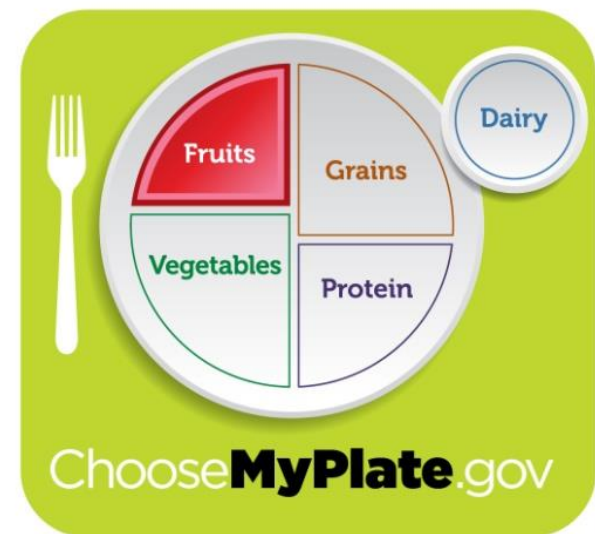
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Fruits



- Any fruit or 100% fruit juice counts as part of the fruit group
- Fruits may be
 - Fresh
 - Canned
 - Frozen
 - Dried
 - Whole, cut-up, or pureed

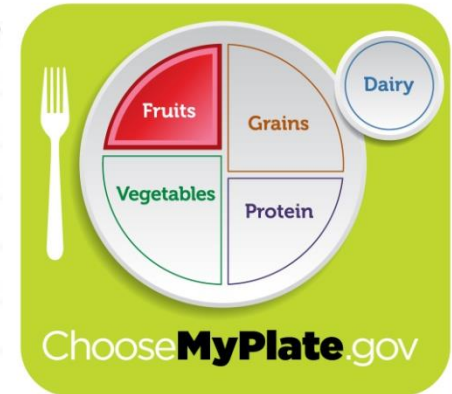
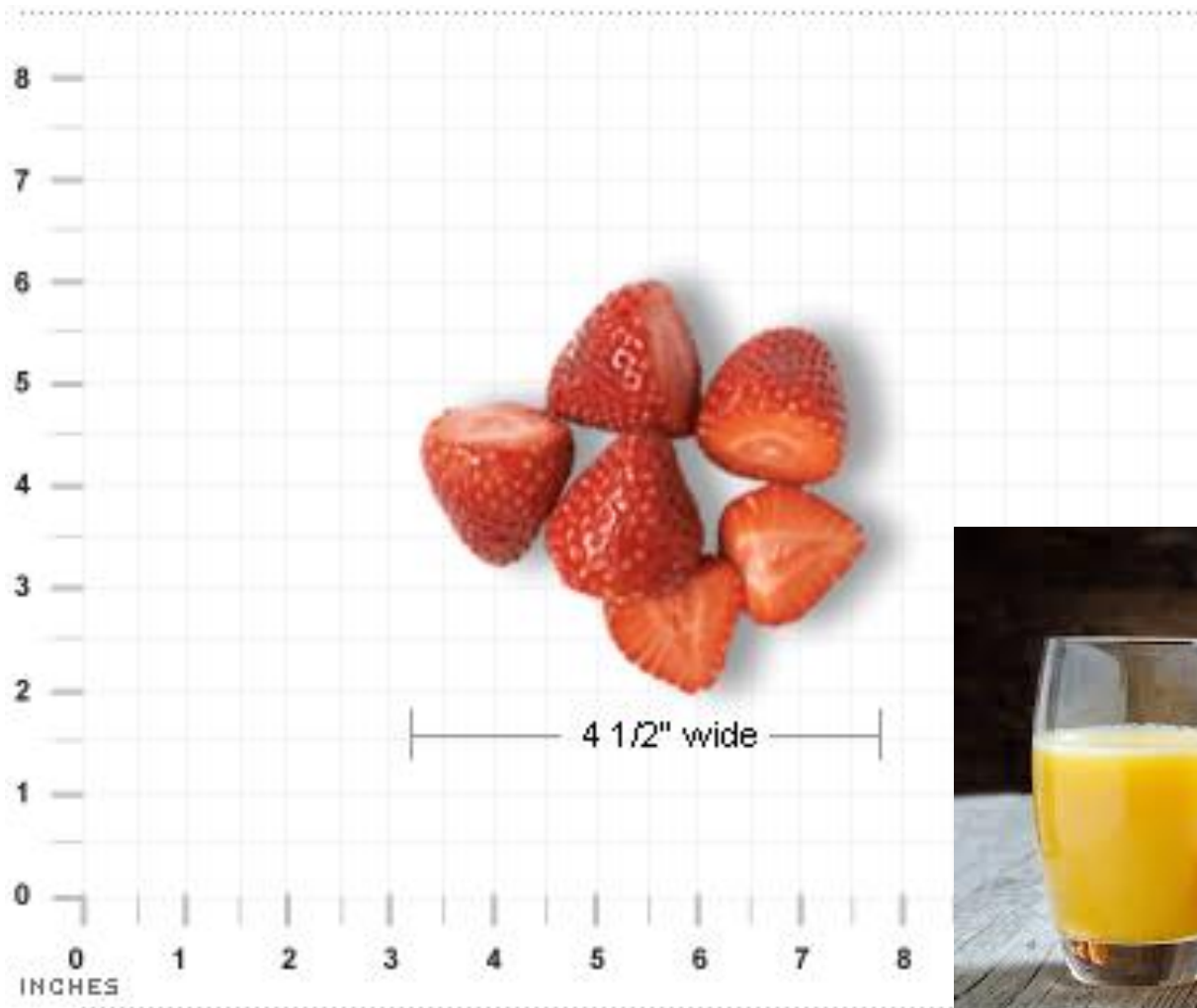


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Fruits: $\frac{1}{2}$ Cup

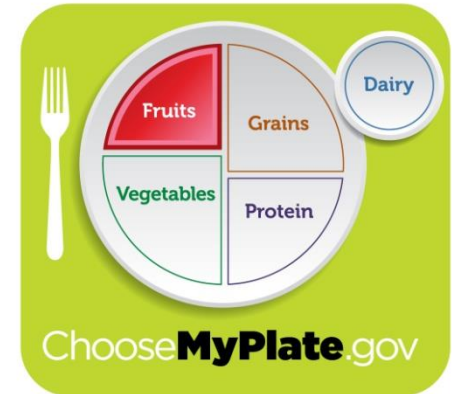
1/2 serving



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Fruits: $\frac{1}{4}$ Cup $\frac{1}{2}$ serving



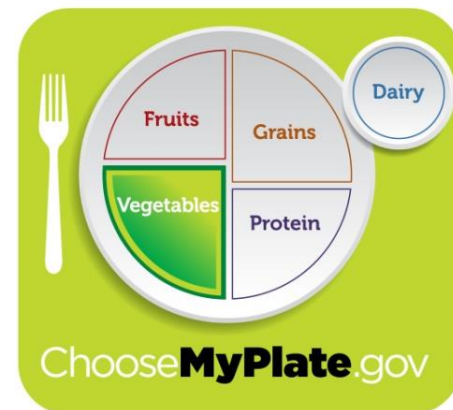
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Vegetables



- Any vegetable or 100% vegetable juice counts as a member of the vegetable group
- Vegetables may be
 - Raw
 - Cooked
 - Fresh
 - Frozen
 - Canned
 - Dried, dehydrated, whole, cut-up or mashed



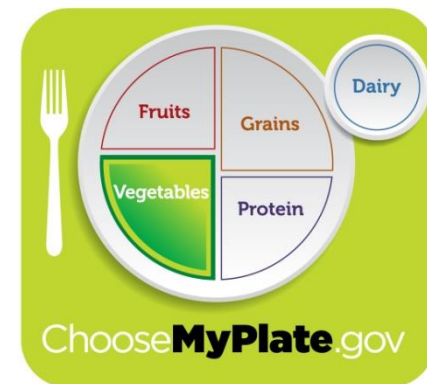
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Vegetables



- **Vegetables subgroups**
 - Based on nutrient content
- **Dark Green**
 - Bok Choy, broccoli, collard greens
- **Orange**
 - Carrots, squash, sweet potatoes
- **Dry beans/peas**
 - Beans, chick peas, tofu curd
- **Starchy**
 - Corn, green peas, potatoes, lima beans
- **Other**
 - Artichokes, asparagus, mushrooms



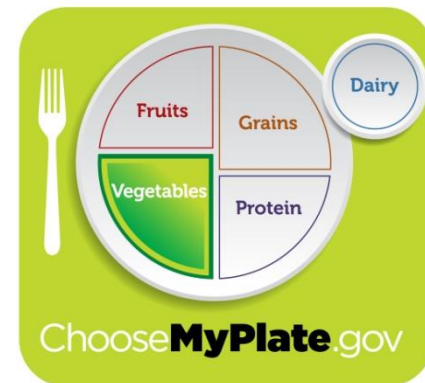
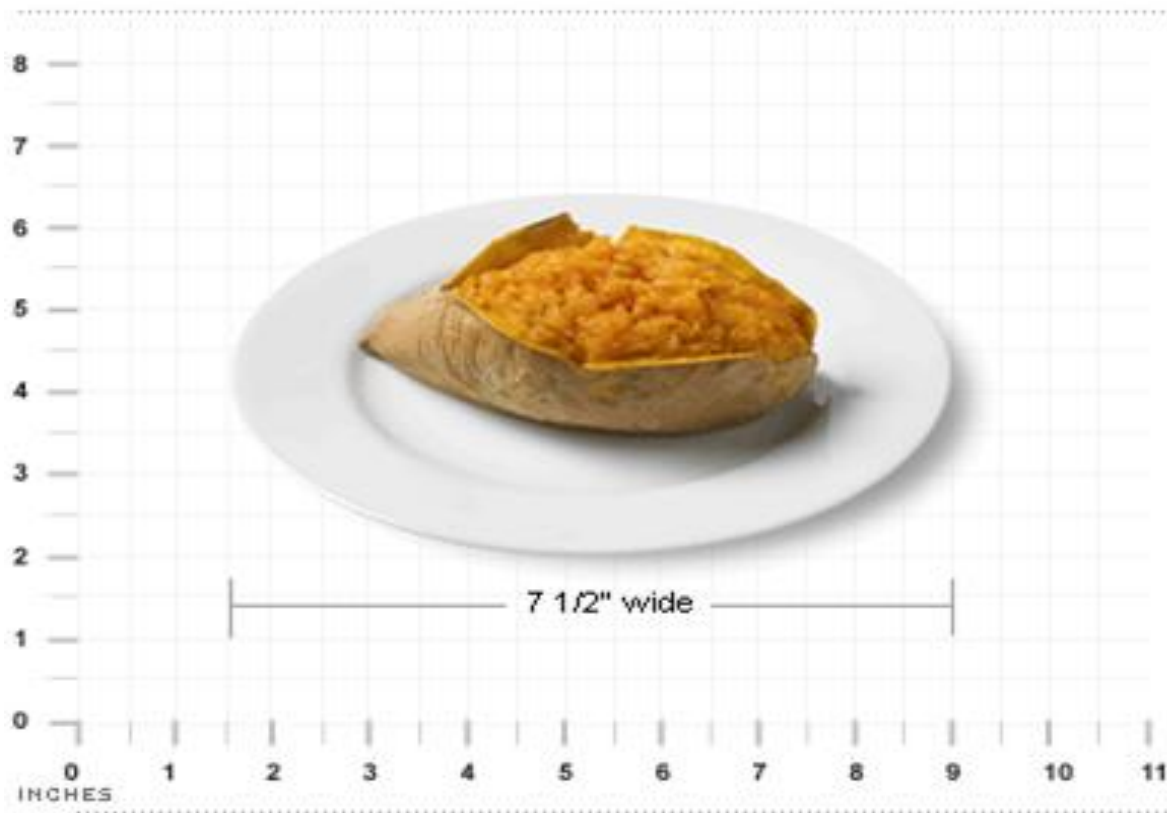


Vegetables



Baked Sweet potato — 1 large

Vegetable Group: counts as 1 cup orange vegetables



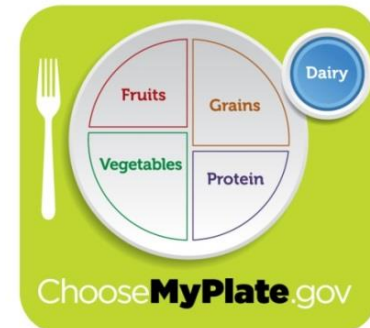
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Dairy



- **All fluid milk products and foods that retain their calcium are part of the dairy group**
- **Foods made from milk that have little to no calcium are not part of the milk group**
 - Cream cheese
 - Cream
 - Butter
- **Most milk group choices should be fat-free or low-fat**





Dairy



- **Common choices:**

- **Milk**

- **Ice milk**

- **Pudding made with milk**

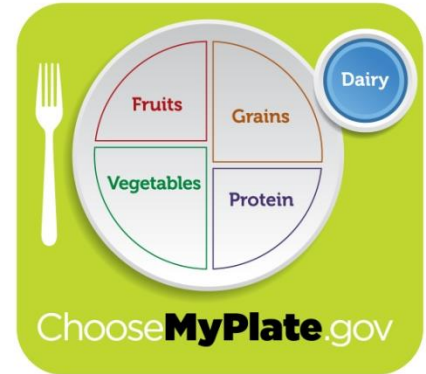
- **Frozen yogurt**

- **Ice cream**

- **Cheeses**

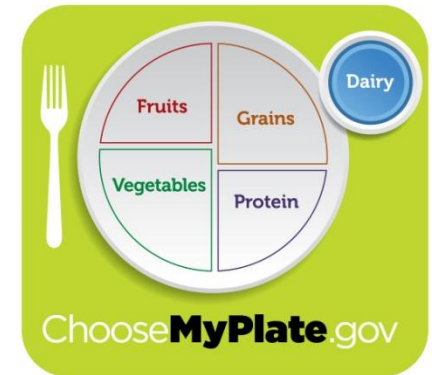
- *Cheddar, mozzarella, parmesan, Swiss, ricotta, cottage cheese, American*

- **Yogurt**





Dairy: ½ Cup ½ Serving



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Oils



- **Oils are fats that are liquid at room temperature**
 - **Ex: Vegetable oils used in cooking**
- **Oils come from different plants and fish**
- **Oils are NOT a food group**
 - **They provide essential nutrients so are included in USDA food patterns**



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Oils



- **Some common oils are:**

- Canola oil
- Corn oil
- Cottonseed oil
- Soybean oil
- Olive oil
- Safflower oil
- Sunflower oil



- **A number of foods are naturally high in oils, like:**

- Nuts
- Olives
- Some fish
- Avocados



Oils



- **Foods that are mainly oil include:**
 - **Mayonnaise**
 - **Certain salad dressings**
 - **Soft (tub or squeeze) margarine with no *trans* fats**
- **Coconut, palm and palm kernel oil are high in saturated fat and should be considered solid fats**



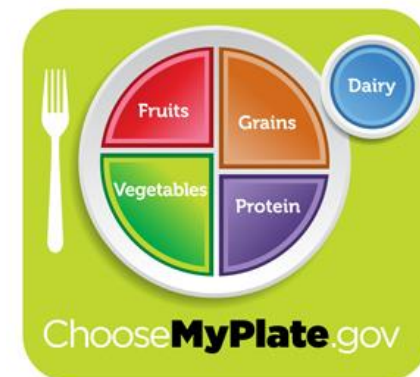
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Oils



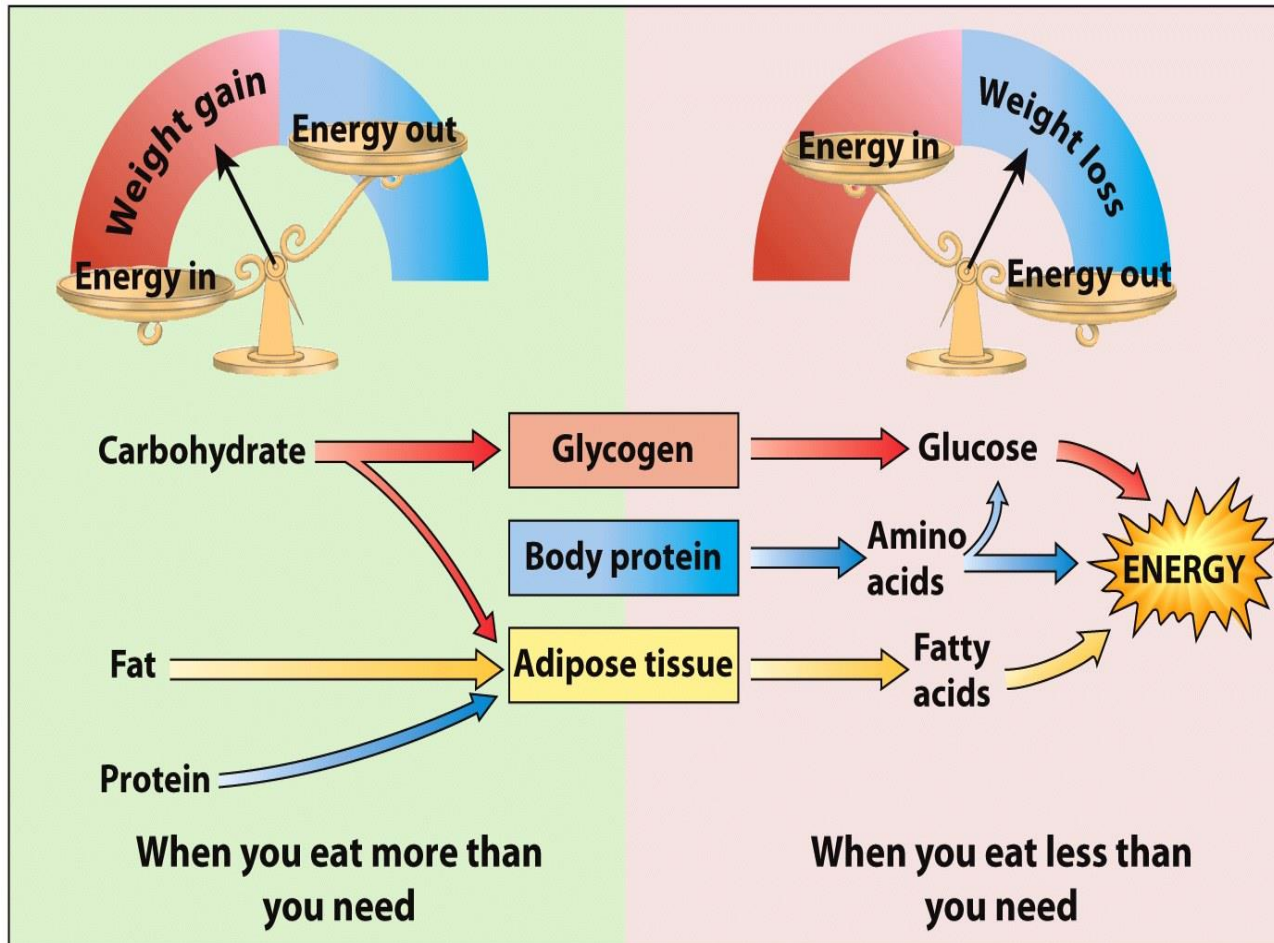
- **Solid fats are solid at room temperature**
- **Solid fats come from many animal foods and can be made from vegetable oils through a process called hydrogenation**
- **Some common solid fats are:**
 - **Butter**
 - **Beef fat (tallow)**
 - **Chicken fat**
 - **Pork fat (lard)**
 - **Stick margarine**
 - **Shortening**



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Energy Balance



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Starting with *YOUR* needs



- **Where to get started?**

- Start by looking at individual energy needs

- *Impacted by:*

- Metabolism
- Age
- Body composition
- Gender
- **Physical Activity**

**Physical activity may be your X factor, and can largely impact your daily needs*

- **Building a diet that works for you**
 - Use a variety of helpful resources



Comparison of Energy Needs



Active Adult

25 year old Male, 70", 175lbs

- **Active at work and home**
- **Exercises 1-2 hours per day**
 - **Basal Metabolic Rate: ~1900 calories per day**
 - **Thermic effect of food: ~200+ calories per day**
 - **X-factor: ~3000 calories per day**
 - **Needs ~5000 calories per day**

Non-Active Adult

25 year old Male, 70", 175 lbs

- **Seated at work and home**
- **Exercise 1 hour or less a day**
 - **Basal Metabolic Rate: ~1900 calories per day**
 - **Thermic effect of food: ~200 calories per day**
 - **X-factor: ~200 calories per day**
 - **Needs ~2200 calories per day**



Calorie Trackers: Online Tools



Multiple programs available that provide different types of information:

- **Choosemyplate.gov**
- **Navy Operational Fitness and Fueling (NOFFS)**
 - **Meal builder**
 - http://www.navyfitness.org/nutrition/noffs_fueling_series/interactive_mealbuilder/



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Dietary Guidelines for Americans



- **Control total calorie intake to manage body weight & increase physical activity while reducing time spent sedentary**

- **Variety of foods**
- **Total fat intake between 20-35%**
- **Less than 10% from saturated fatty acids**
- **Reduction in sodium consumption**
- **Alcoholic beverages in moderation**
- **At least 30 minutes of moderate-intensity physical activity, above usual activity, at work or home on most days**





ChooseMyPlate.gov



- **Enjoy your food, but eat less**
 - **Avoid oversized portions**
- **Make half your plate fruits and vegetables**
- **Switch to fat-free or low-fat (1%) milk**
- **Make at least half your grains whole grains**
- **Compare sodium in foods like soup, bread, and frozen meals—and choose foods with lower numbers**
- **Drink water instead of sugary drinks**

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Visualizing A Real Plate



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Unbalanced Plate



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Portion Distortion

What you're served

What's one serving



1/2 lb. cheeseburger, French fries,
3/4 cup ketchup, tomato slice and lettuce.
1,345 calories
53 grams fat



1/4 lb. cheeseburger, half the French fries,
2 tablespoons ketchup, tomato slice and lettuce.
685 calories
33 grams fat

DID YOU KNOW?

- Americans are the heaviest of people in developed countries. The U.S. surgeon general has called obesity a national epidemic.
- 61 percent of Americans are overweight.

- Consuming an extra 100 calories daily for a year, without using them up, can lead to a weight gain of 10 pounds.
- Every gram of carbohydrate or protein equals 4 calories.

- The number of overweight people in the world – 1.1 billion – now equals the number of undernourished people.
- With each decade as we age, we need 100 fewer calories per day.

- Every gram of fat equals 9 calories.
- 10 calories a day (2 hard candies) of unexpended energy puts on an extra pound a year.

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Dietary Guidelines for Americans



each plate represents 200 calories



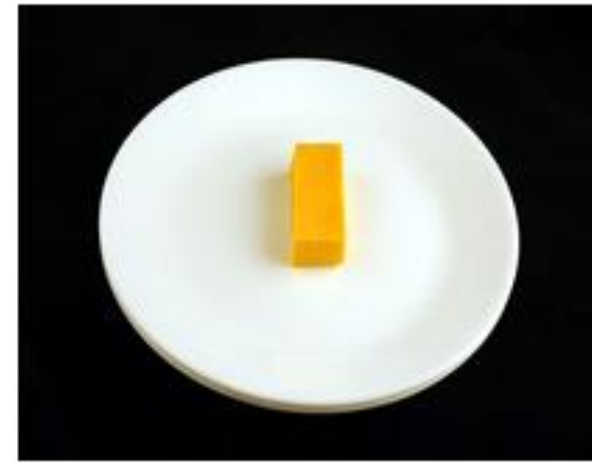
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Dietary Guidelines for Americans



each plate item provides ~200 calories



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Putting It All Together



What's the weight goal?

- **Fat Loss:** Decrease the amount of calories through a well balanced diet & physical activity by 500 calories
- **Muscle Gain:** Increase the amount of calories in a well balanced diet by 250+ calories, plus well planned weight training
- **Weight Maintenance:** Well balanced diet with optimum calories for activity level



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