Module 2
Nutrition Basics
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

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.

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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 \(\rightarrow\) 100 oz of water
Visualizing 100 oz Water

Five 20 oz bottles

or

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


- 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

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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.
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
- Whole grains contain the entire grain kernel
  - Bran
  - Germ
  - Endosperm
Identify Whole Grains

The product may contain some refined grain.

All grain ingredients are whole grains.

EAT 48g OR MORE OF WHOLE GRAINS DAILY

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WholeGrainsCouncil.org

WholeGrainsCouncil.org
Grain: ½ Cup
Grains: 3 Cups
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
Protein Foods: 5 oz
Protein Foods: 8 oz

10 1/2" wide

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Protein Foods: ½ Cup
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
Fruits: ½ Cup
1/2 serving
Fruits: ¼ Cup
1/2 serving
• 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
Vegetables

- Vegetables subgroups
  - Based on nutrient content
- Dark Green
  - Bok Choy, broccoli, collard greens
- Orange
  - Carrots, squash, sweet potatoes
- Dry beans/peas
  - Beans, chic 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

7 1/2" wide
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
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
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
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.
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
Energy Balance

When you eat more than you need:
- Carbohydrate
- Fat
- Protein
- Adipose tissue
- Body protein
- Glycogen

When you eat less than you need:
- Glucose
- Amino acids
- Fatty acids
- ENERGY

Weight gain: Energy in > Energy out
Weight loss: Energy in < Energy out
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
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/](http://www.navyfitness.org/nutrition/noffs_fueling_series/interactive_mealbuilder/)
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
• 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
Visualizing A Real Plate
Unbalanced Plate
Portion Distortion

What you’re served

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

What’s one serving

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.
- Consume 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 we age, we need to burn 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.
Dietary Guidelines for Americans

each plate represents 200 calories
Dietary Guidelines for Americans

GOAL #3: Consume fewer foods with sodium (salt), saturated fats, trans fats, cholesterol, added sugars, and refined grains

Each plate item provides ~200 calories
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
Discussion