Energy Balance

Basic Maintenance Check

How Do I GET Energy?

What provides energy for our body?

Food

How do we measure energy in our food?

Calories

What nutrients in food provide calories?

- Carbohydrates
- Protein
- Fat

What is a calorie?

Calorie:

A calorie is a measurement of the energy a food or beverage provides.

Calories are the fuel you need to work and play. Foods vary in how many calories and nutrients they contain.

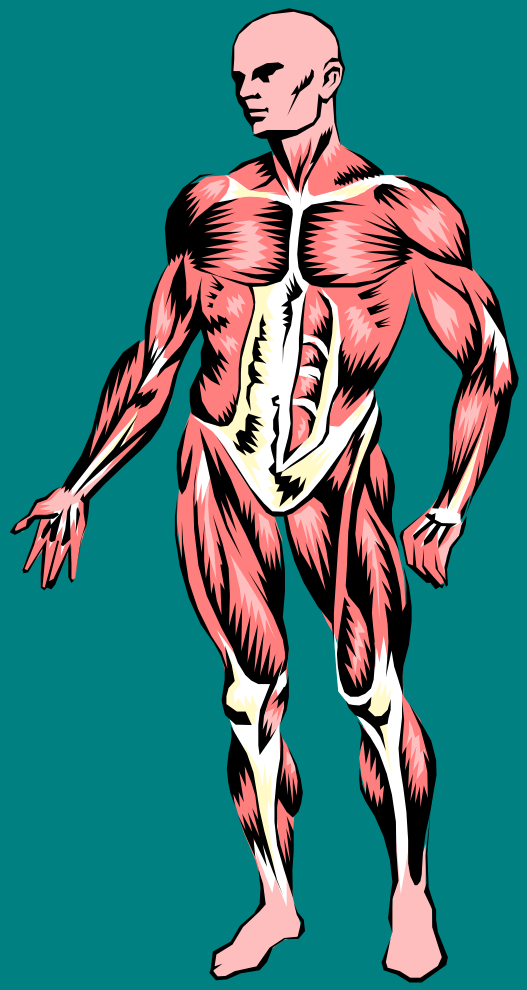
Be on the lookout for "empty calories"

How Do I USE Energy?

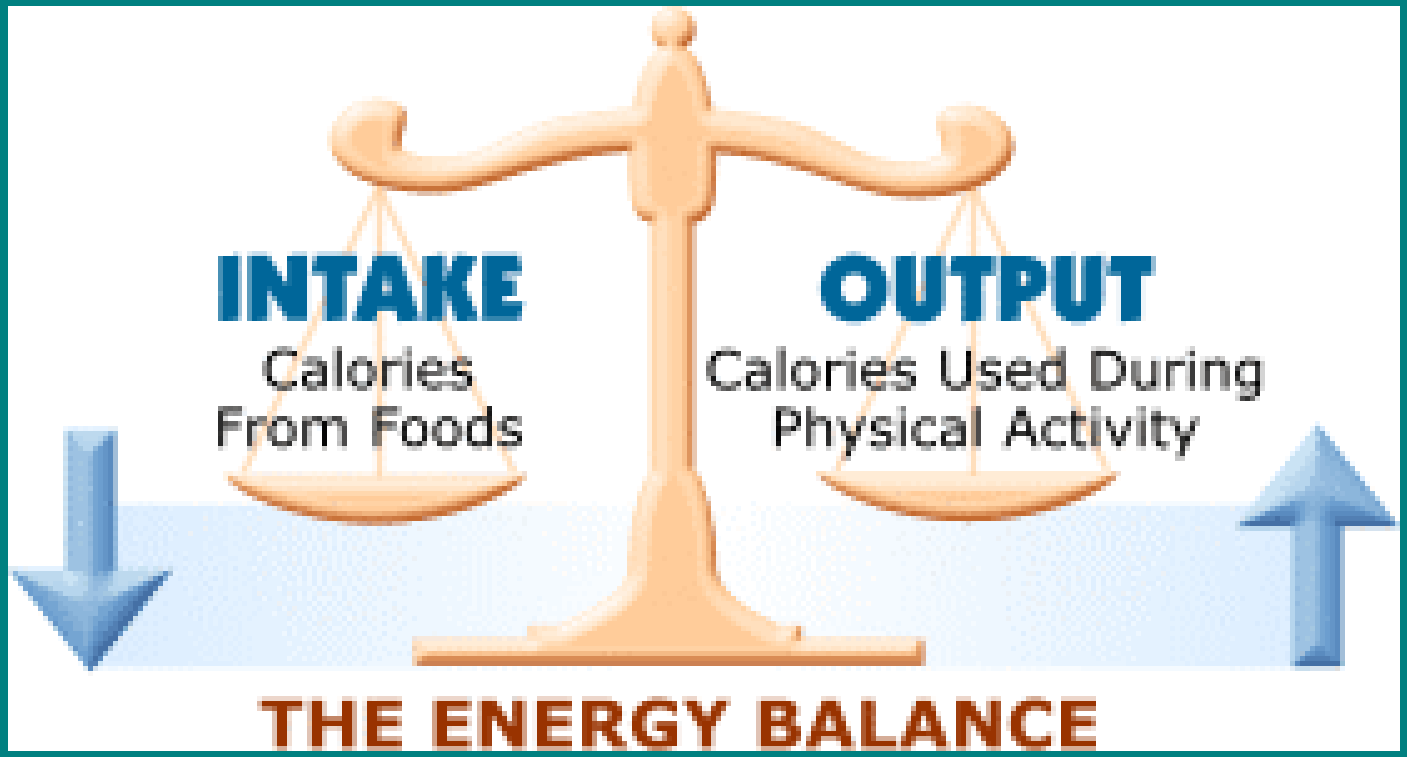
1. Basal Metabolism
energy to stay alive

2. Physical Activity
energy needed to move our muscles on purpose

3. Thermic Effect of Food
energy needed for digestion



Energy In and Energy Out



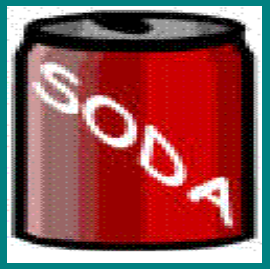
Carbohydrates: *Provide energy*

- Dietary Guidelines for Americans: Carbohydrates: 45 – 65% (average 55%)
- Provide 4 calories per gram
- Body's preferred energy source
- Starches and sugars found in foods
- Carbs are converted into glucose (simple sugar used by cells).
- Glucose not used right away is stored in the liver and muscles as glycogen. Glycogen can be be converted back to glucose.
- Extra glucose-> stored as adipose (body fat)

Carbohydrates: *Provide energy*

1. Simple Sugars

* Added sugars- corn syrup



Fructose (fruit) Lactose (milk) Maltose (grain) Sucrose (sugar)

2. Complex Carbohydrates (starches)

Whole grains, seeds, vegetables, nuts, legumes, potatoes

Carbohydrates: *Provide energy*

1. Simple Sugars- digested by body more quickly, very little nutritional value, can cause spikes in blood sugar, don't provide long lasting energy

2. Complex Carbohydrates (starches)- These sugars are mostly rich in **fiber**, vitamins and minerals. Due to their complexity, they take a little longer to digest, and they don't raise the sugar levels in the blood as quickly as simple carbohydrates.

Protein *Maintain the body*

Important for:

- Muscle growth and repair
- Building material for many body tissues

Choose Wisely:

- Fish, shellfish, lean meats
- Trim fat and remove skin
- Limit high fat processed meats
- Choose beans, nuts, & seeds








Protein *Maintain the body*

- Dietary Guidelines for Americans:
- Protein: 10 – 35%
- Muscles, organs, antibodies, enzymes, and some hormones are largely composed of protein.
- Important for tissue repair, fluid balance, blood clotting, and vision
- 4 calories per gram
- Excess protein calories converted to fat for storage

Protein *Maintain the body*

- Most experts believe that most people get more than enough protein daily. Americans eats about 50% more than the recommended daily amount.
- The American Dietetic Association (ADA) recommends daily protein intake for healthy teen as .8-1.0 g of protein/kg body weight.
- Your body weight/ 2.2 = weight in Kilograms
- Weight in Kilograms x .8, .9. 1.0

Protein *Maintain the body*

- Proteins are made of chains of building blocks called amino acids: substances that make up body proteins.
- Your body can make all but nine of the 20 different amino acids.
- These nine are called the essential amino acids because they MUST come from the foods you eat.




Protein *Maintain the body*

- Complete Proteins: have all the essential amino acids that the body needs.
  - Animal products- fish, meat, chicken, eggs, milk, yogurt, and cheese.

- Incomplete Proteins: lack some of the essential amino acids.
  - Foods derived from the seeds of plants- legumes, nuts, whole grains, and seeds.
  - Eating various incomplete proteins yields the equivalent of a complete protein

FAT

Dietary Guidelines for Americans: Fats: 20 – 35%

- Needed for energy storage, vitamin absorption (ADEK)
- Most concentrated form of energy: 9 calories/gram
- Fats are made up of fatty acids and cannot dissolve in water (b/c of their chemical structure)

- Three types of fats in the diet:
  - Saturated Fat- the bad
  - Unsaturated Fat- the good
  - Trans Fats – the ugly

Saturated Fat

- Considered saturated b/c the fatty acid is holding all the hydrogen atoms it can! (Solid at room temperature)

  - Animal sources, including: meat and dairy products. Examples are fatty beef, lamb, pork, poultry with skin, lard and cream, butter, cheese and other dairy products made from whole or reduced-fat (2 percent) milk.

  - In addition, many baked goods and fried foods can contain high levels of saturated fats. Some plant foods, such as palm oil, palm kernel oil and coconut oil, also contain primarily saturated fats, but do not contain cholesterol.

Saturated Fat

- Dangers of Saturated Fats:
- Eating foods that contain saturated fats raises the level of cholesterol in your blood.
- High levels of blood cholesterol increase your risk of heart disease and stroke.
- Be aware, too, that many foods high in saturated fats are also high in cholesterol – which raises your blood cholesterol even higher

Cholesterol

- Cholesterol: fatlike substance produced in the liver of all animals and therefore found in foods of animal origin.
- Ex- meats, chicken, fish, eggs, dairy products
- Your body needs cholesterol but makes what it needs.
- Needed for production of sex hormones, vitamin D, and myelin
- Elevated blood cholesterol levels in blood are a major factor for heart and circulatory diseases.

Cholesterol

- Low-density lipoprotein (LDL): aka, "bad" cholesterol; clogs the arteries restricts blood cholesterol; clogs the arteries, restricts blood flow

Trans Fats, Saturated Fats

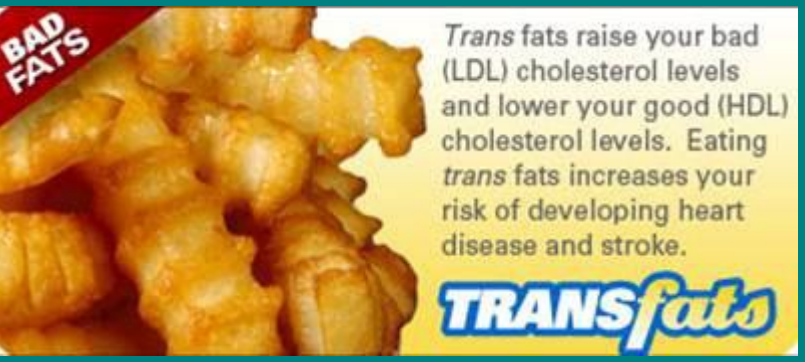
- High-density lipoprotein (HDL): aka, the "good" cholesterol; helps to keep bad cholesterol from building up in the arteries

Unsaturated fats & Omega 3 Fatty Acids

Unsaturated Fat

- Missing one or more pairs of hydrogen atoms.
- Liquids or oils at room temperature.
- Example: fish, nuts, seeds, oils from plants (olive/canola), avocadoes

- Polyunsaturated & monounsaturated fats help lower your blood cholesterol level when you use them in place of saturated and trans fats.



Trans Fats

- Trans fats (or trans fatty acids) are created in a hydrogenation process that adds hydrogen to liquid vegetable oils to make them more solid. Another name for trans fats is "partially hydrogenated oils."

- Trans fats raise your bad (LDL) cholesterol levels and lower your good (HDL) cholesterol levels.
- Eating trans fats increases your risk of developing heart disease and stroke.
- It's also associated with a higher risk of developing type 2 diabetes.

Examples: fried foods, baked goods, margarines and shortenings

FAT

EAT MORE:

Unsaturated Fat

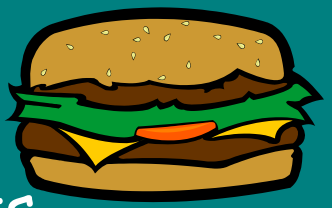
- Vegetable oils, nuts, and fish

Needed for energy storage and vitamin absorption

EAT LESS:

Saturated Fat

- High fat dairy, fatty meats



Trans Fat

- Fried food & baked goods

Can raise cholesterol and increase risk of heart disease

Estimated Calorie Needs

		Activity Level		
Gender	**Age**	**Sedentary**	**Moderately Active**	**Active**
Female	14-18	1800	2000	2400
Male	14-18	2000-2400	2400-2800	2800-3200

A Typical Day?

BREAKFAST

Cold cereal:

1 cup shredded wheat

½ cup sliced banana

½ cup fat-free milk

1 slice whole wheat toast

2 tsp all-fruit preserves

Beverage:

1 cup fat-free chocolate milk

LUNCH

Turkey sandwich

1 whole wheat pita bread (2 oz)

3 ounces roasted turkey, sliced

2 slices tomato

¼ cup shredded lettuce

1 tsp mustard

1 Tbsp mayonnaise

½ cup grapes

Beverage: 1 cup tomato juice

DINNER

Steak and potatoes:

4 ounces broiled beef steak

2/3 *cup mashed potatoes made with milk and 2 tsp tub margarine*

½ cup cooked green beans

1 tsp tub margarine

1 tsp honey

1 ounce whole wheat roll

1 tsp tub margarine

Frozen yogurt and berries:

½ cup frozen yogurt (chocolate)

¼ cup sliced strawberries

Beverage: 1 cup fat-free milk

SNACKS

1 cup frozen yogurt (chocolate)

ENERGY IN =

2000 Calories

Energy Out

How Do I Use Energy?

1. Basal Metabolism
energy to stay alive

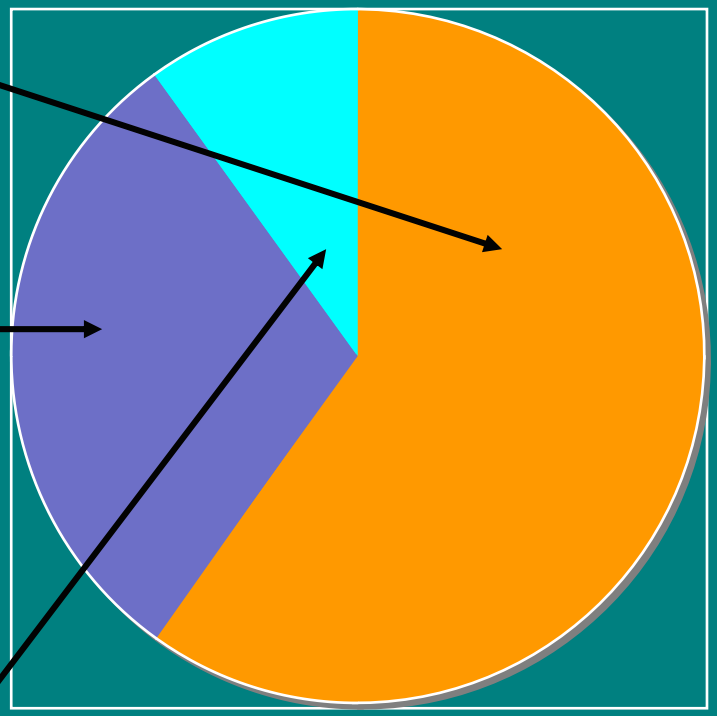
(about 60%)

2. Physical Activity
energy needed for muscular work

(about 30-40%)

3. Thermic Effect of Food
energy needed for digestion

(about 10%)



Why is Physical Activity Important?

Being physically active can help you:

- Increase your chances of living longer
- Feel better about yourself
- Decrease your chances of becoming depressed
- Sleep well at night
- Move around more easily
- Have stronger muscles and bones
- Stay at or get to a healthy weight
- Be with friends or meet new people
- Enjoy yourself and have fun

Physical Activity and Your Health

When you are *not* physically active, you are more likely to:

- Get heart disease
- Get type 2 diabetes
- Have high blood pressure
- Have high blood cholesterol
- Have a stroke

Physical Activity Guidelines

For teenagers:

- Get at least 60 minutes of physical activity each day
- Most of it should be either moderate- or vigorous-intensity aerobic activity
- Try to include muscle-strengthening activity on 3 days of each week and bone-strengthening activity on 3 days of each week

Types of Physical Activity

Aerobic

- Moving continuously in a rhythm
- Make you breathe harder and your heart beat faster
- Running, jumping rope, swimming, dancing, biking

Muscle-strengthening

- Making muscles work more than usual
- Climbing, tug-of-war, lifting weights, push-ups

Bone-strengthening

- Moving our bones against the force of gravity
- Running, jumping rope, basketball, tennis, weight-lifting

Balance and Stretching

- Enhance physical stability and flexibility, which reduces risk of injuries
- Gentle stretching, dancing, yoga, martial arts, and t'ai chi

Intensity of Physical Activity

Moderate

- Biking
- Hiking
- Rollerblading
- Brisk Walking

Vigorous

- Running
- Jumping rope
- Sports like soccer, hockey, basketball, swimming, and tennis

So what happens when…

Energy In ≠ Energy Out

How Weight Gain Happens

Consuming extra calories over time

weight gain