

**By:**  
**Dr. Keshav Singh Gurjar**  
**H.O.D Physical Education Department,**  
**Jiwaji University, Gwalior**

# NUTRIENT BASICS

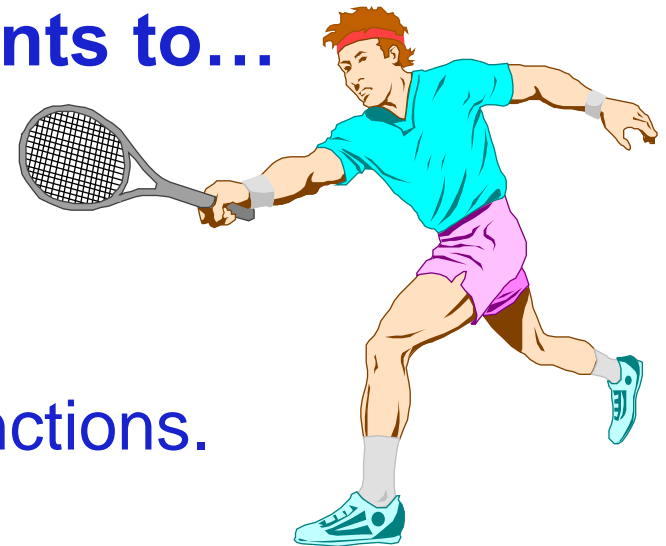




# Nutrients

---

- ◆ The food you eat is a source of nutrients. Nutrients are defined as *the substances found in food that keep your body functioning.*
- ◆ Your body needs nutrients to...
  - Fuel your energy.
  - Help you grow.
  - Repair itself.
  - Maintain basic bodily functions.





# Balance is Key



*For years, people held to the idea that there are “bad” nutrients and “good” nutrients when, in fact, all nutrients play a certain role in the body. Even those nutrients once considered “bad” such as fats and carbohydrates perform vital functions in the body and if one consumes too many “good” nutrients such as vitamins or minerals there can be harmful results, as well.*

**These three are the framework of the Food Guide Pyramid:**

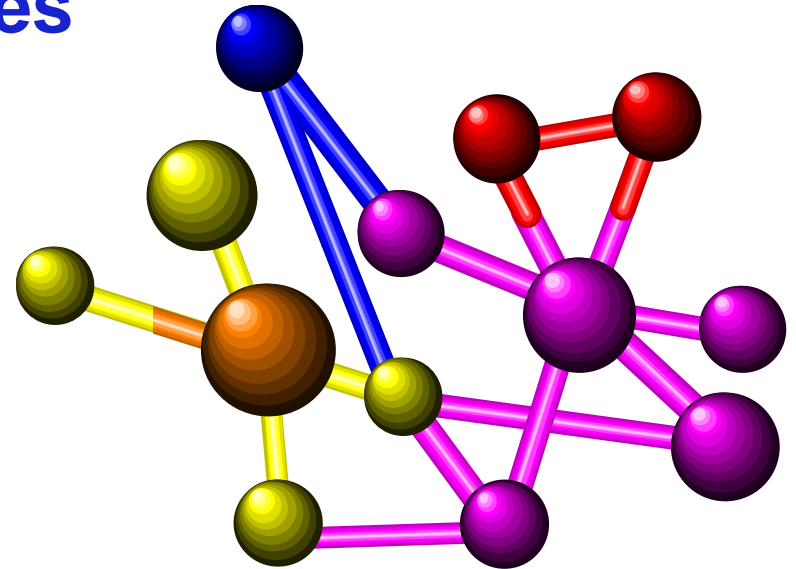
- ◆ **Balance** - Eat foods from all groups of the Food Guide Pyramid.
- ◆ **Variety** - Eat different foods from each food group.
- ◆ **Moderation** - Eat more foods from the bottom of the pyramid, and fewer and smaller portions of foods from the top of the pyramid.



# The 6 Essential Nutrients

---

- ◆ Water
- ◆ Carbohydrates
- ◆ Protein
- ◆ Fat
- ◆ Vitamins
- ◆ Minerals





# Water



## ◆ Did you know?

- 1/2 to 3/4 of the human body consists of water!

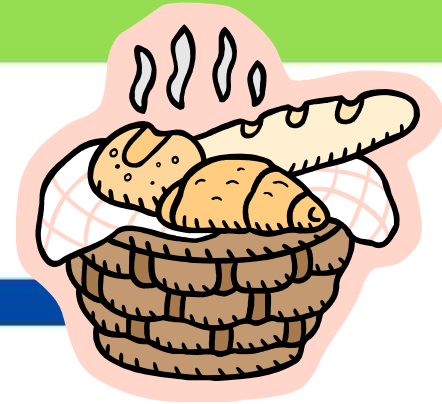
## ◆ Functions in the Body:

- Water carries nutrients to your cells and carries waste from your body.
- Regulates body temperature.
- Dissolves vitamins, minerals, amino acids and other nutrients.
- Lubricates joints.

*It is recommended that teens drink 6-8 glasses (8 fl.oz each) of water each day. This is in addition to around 4 cups of water you get from food each day.*



# Carbohydrates



*Carbohydrates are the body's main source of energy and provide the body's need for dietary fiber.*

## ◆ Food Sources:

- Pasta, breads, cereals, grains, rice, fruits, milk, yogurt and sweets.

## ◆ Two types of Carbohydrates:

- Starches or Complex Carbohydrates
- Simple Carbohydrates



# Simple Carbohydrates

---

## ◆ Food Sources:

- Fruits, juices, milk, and yogurt.
- Candy, soda, and jelly.
  - These simple carbohydrates have a bad reputation because they are high in calories and low in nutritional value.







# Starches or Complex Carbohydrates

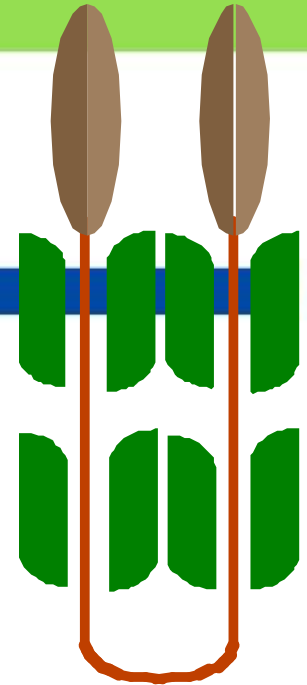
---

## ◆ Food Sources:

- Whole grain breads and cereals, pasta, vegetables, rice, tortilla and legumes.

## ◆ Function in the Body:

- An excellent source of fuel (energy) for the body.
- Rich in vitamins, minerals and fiber.

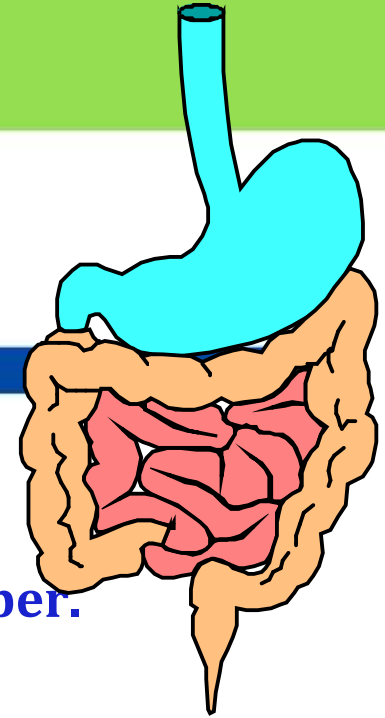




# Fiber

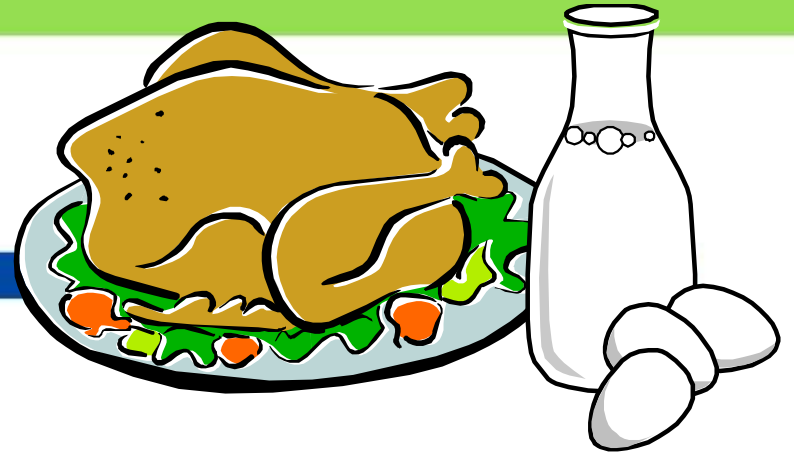
---

- ◆ Fiber is the plant material that doesn't break down when you digest food. Many, but not all, complex carbohydrates contain fiber.
- ◆ **Food Sources:**
  - Oatmeal, fruits, vegetables, whole grains and legumes.
- ◆ **Function in the Body:**
  - Aids in digestion.
  - May reduce the risk of developing some diseases like heart disease, diabetes and obesity, and certain types of cancer.
  - Helps promote regularity.





# Proteins



## ◆ Food Sources:

- Meat, fish, eggs, poultry, dairy products, legumes, nuts and seeds. (Breads, cereals and vegetables also contain small amounts of protein.)

## ◆ Function in the Body:

- Provides energy.
- Help to build, maintain, and repair body tissues.

## ◆ Proteins are made up of chemical compounds called amino acids. There are 20 amino acids.



# Amino Acids

*Of the 20 amino acids, the human body is capable of producing 11 of them. The other 9 called, “Essential Amino Acids” must be supplied by food sources.*

## ◆ Two types of Protein:

- Complete Proteins:
  - Contain all 9 essential amino acids.
  - They are found in animal sources.
- Incomplete Proteins:
  - Lack one or more of the essential amino acids.
  - They are found in plant sources.

*The best way to give the body complete proteins is to eat a wide variety of foods throughout the day.*





# Fat

*- The most concentrated form of food energy (calories).*

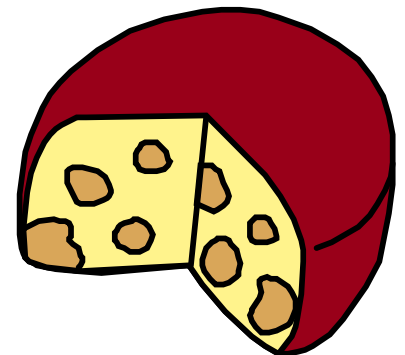
---

## ◆ Food Sources:

- Butter, vegetable oils, salad dressings, nuts and seeds, dairy products made with whole milk or cream, and meats.

## ◆ Function in the Body:

- Provide substances needed for growth and healthy skin.
- Enhance the taste and texture of food.
- Required to carry “fat-soluble” vitamins throughout the body.
- Provide energy.





# Types of Fat

## ◆ Saturated Fat:

- Fats that are usually solid at room temperature.
- **Food Sources:** Animal foods and tropical oils.
- The type of fat most strongly linked to high cholesterol and increased risk of heart disease.

## ◆ Unsaturated Fat:

- Fats that are liquid at room temperature.
- **Polyunsaturated Fat:**
  - **Food Sources:** Vegetables and fish oils.
  - Provide two essential fatty acids necessary for bodily functions.
- **Monounsaturated Fat:**
  - **Food Sources:** Olive oil, canola oil, nuts, seeds.
  - May play a role in reducing the risk of heart disease.



# Cholesterol

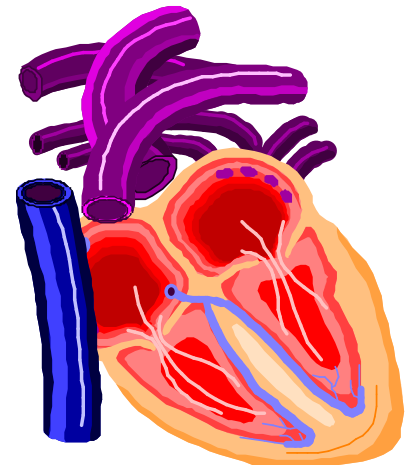
- *A fat-like substance that is part of every cell of the body.*

## ◆ Function in the Body:

- Helps the body make necessary cells including skin, and hormones.
- Aids in digestion.
- The human body manufactures all the cholesterol it needs. You also get cholesterol from animal food products you eat.

## ◆ When cholesterol levels are high there is a greater risk for heart disease.

- *Do you know what the healthy cholesterol range is for teens your age?*





# Vitamins



## ◆ Food Sources:

- Fruits, vegetables, milk, whole-grain breads, cereals and legumes.

## ◆ Unlike carbohydrates, fats, and proteins, vitamins DO NOT provide energy (calories).

## ◆ Function in the Body:

- Help regulate the many chemical processes in the body.
- There are **13 different vitamins** known to be required each day for good health.
- Vitamins are separated into two types: **Fat Soluble & Water Soluble Vitamins.**





# Fat/Water Soluble Vitamins

## ◆ Fat Soluble Vitamins

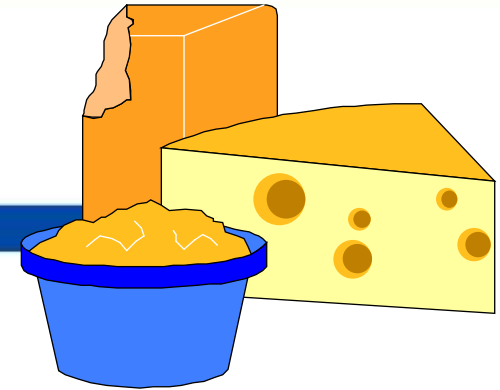
- Vitamins A, D, E, K
- Require fat for the stomach to allow them to be carried into the blood stream for use (absorption).
- Can be stored in the body for later use.

## ◆ Water Soluble Vitamins

- Vitamins C and B-complex
- Require water for absorption.
- Easily absorbed and passed through the body as waste.



# Vitamin A

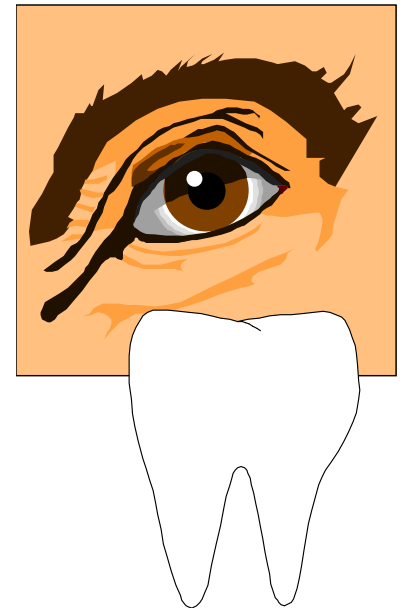


## ◆ Food Sources:

- Dark green, leafy vegetables, deep yellow and orange fruits and vegetables, liver, milk, cheese, and eggs.

## ◆ Function in the Body:

- Helps keep skin and hair healthy.
- Aids in night vision.
- Plays a role in developing strong bones and teeth.





# Vitamin D



## ◆ Food Sources:

- Vitamin D fortified milk, egg yolk, salmon, and liver.
- Nonfood Source: the sun.

## ◆ Function in the Body:

- Helps the body use calcium and phosphorus.
- Plays a role in building strong bones and teeth.



# Vitamin E



## ◆ Food Sources:

- Whole-grain breads and cereals; dark green, leafy vegetables; dry beans and peas; nuts and seeds; vegetable oils; margarine; liver.

## ◆ Function in the Body:

- Helps form red blood cells, muscles, and other tissues.



# Vitamin K

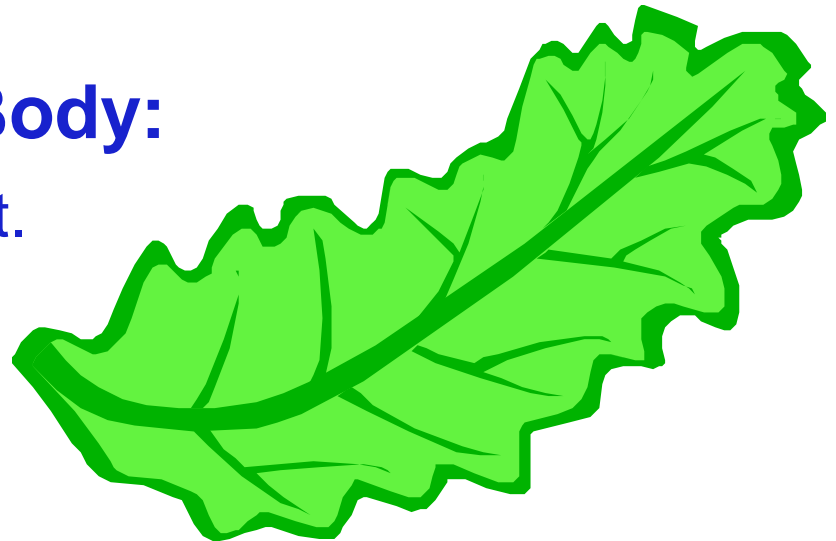
---

## ◆ Food Sources:

- Dark green and leafy vegetables (such as spinach, lettuce, kale, collard greens), and cabbage.

## ◆ Function in the Body:

- Helps blood to clot.





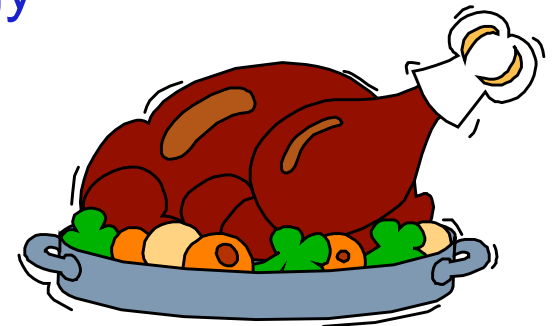
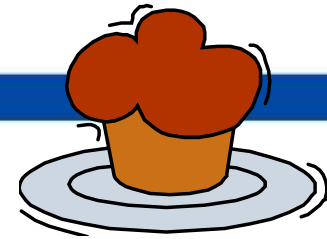
# Vitamin B-complex

## ◆ Food Sources:

- Whole grain and enriched breads and cereals; dry bean and peas; peanut butter; nuts; meat; poultry; fish; eggs; milk.

## ◆ Function in the Body:

- Helps the body use the energy from the foods we eat.
- Helps brain, nerves, and muscles function.





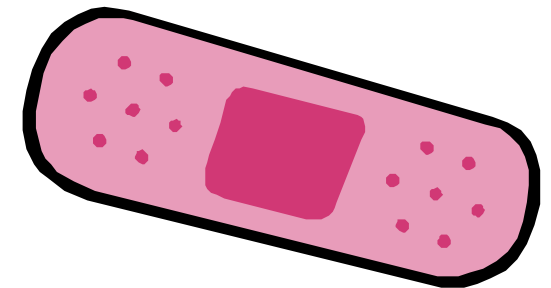
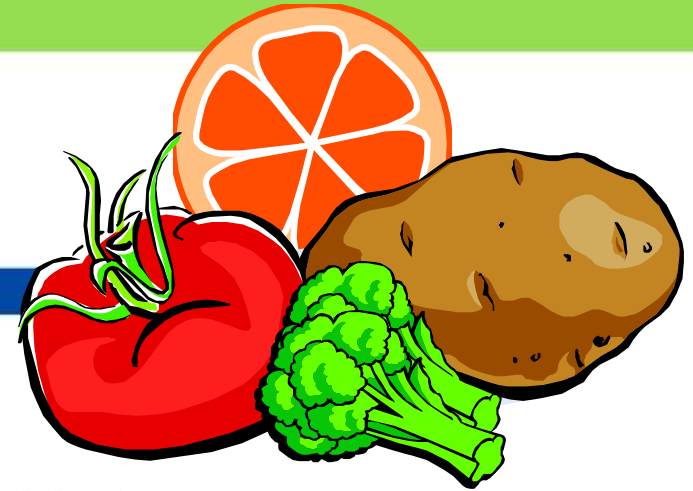
# Vitamin C

## ◆ Food Sources:

- Citrus fruits, strawberries, kiwi, broccoli, tomatoes, and potatoes.

## ◆ Function in the Body:

- Helps heal wounds.
- Helps maintain healthy bones, teeth, and blood vessels.
- Helps body fight infection.





# Minerals



## ◆ Food Sources:

- Meats, beans, nuts, fruits, vegetables, dairy products, and grains.

## ◆ Functions in the Body:

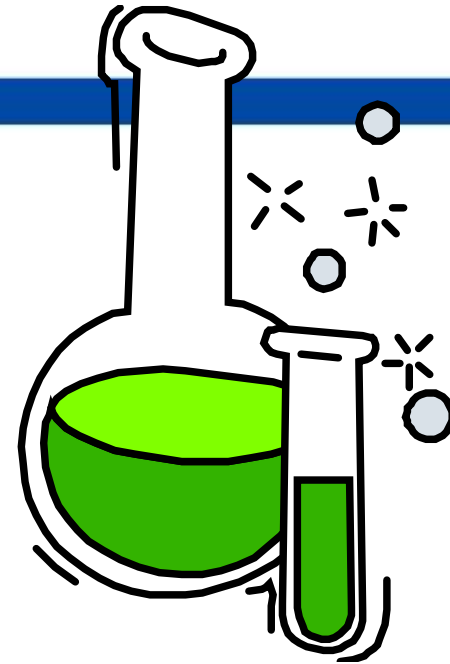
- The body depends on minerals for practically every process necessary for life.
- Minerals actually become part of the body.
- The body requires 16 minerals daily.





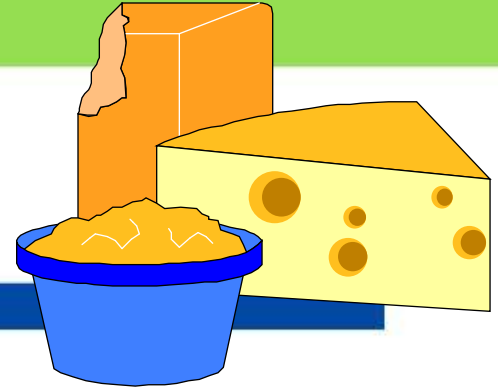
# Minerals

- ◆ Calcium
- ◆ Phosphorus
- ◆ Magnesium
- ◆ Sodium
- ◆ Potassium
- ◆ Iron
- ◆ Others include:
  - Iodine, Zinc, Copper, Sulfur, Chloride, etc.





# Calcium & Phosphorus



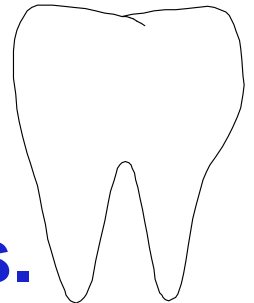
## ◆ Food Sources:

- Dairy Products: milk, cheese, ice cream, green leafy vegetables, canned sardines and other processed fish eaten with bones.

## ◆ Function in the Body:

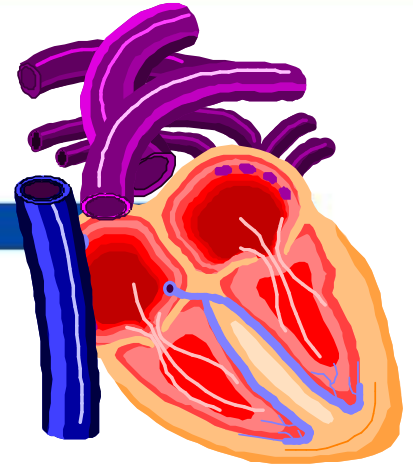
- Helps build and maintain healthy bones and teeth.
- Helps heart, nerves, and muscles work properly.

## ◆ Deficiency (lack) of calcium & phosphorus leads to osteoporosis.





# Iron



## ◆ Food sources

- Liver, kidney, heart, meat, egg yolk, dried beans and peas, spinach, dried fruit, whole-grain & enriched breads & cereals, nuts.

## ◆ Function in the Body:

- Helps make hemoglobin in red blood cells.
- Helps cells used oxygen.

## ◆ Deficiency (lack) of iron leads to anemia.



# Sodium

## ◆ Food sources

- Processed & prepared foods. Canned vegetables, soups, pickles, lunch meats, ham, bacon, sausage, hotdogs, and frozen foods. Salt/sodium is used to preserve food and improve the taste and texture of food.
- Condiments. Table salt, soy sauce, ketchup, mustard, BBQ sauce, steak sauce...
- Natural sources. Some meats, poultry, dairy products (esp. cheeses) and vegetables.



- 5% added while cooking
- 6% added while eating
- 12% from natural sources
- 77% from processed and prepared foods

**The main sources of sodium in the average U.S. diet.**

# Sodium



## ◆ Function in the Body:

- Helps maintain the right balance of fluids in your body.
- Helps transmit nerve impulses.
- Influences the contraction and relaxation of muscles.

## ◆ Excess sodium can lead to hypertension (high blood pressure), a condition that can lead to cardiovascular and kidney diseases.





# Nutrient Deficiency

---

- ◆ **A nutritional deficiency occurs when your body doesn't get enough nutrients.**
- ◆ **Symptoms:**
  - At first the symptoms may not seem serious. They may include: tiredness, difficulty sleeping or concentrating, frequent colds, and weight loss or gains.
  - However, if the deficiency is not corrected the symptoms may get more serious and effect the skin, eyes, and bones.
- ◆ **The best way to avoid a nutrient deficiency is to eat a well balanced diet.**



# Exploring the Web



- ◆ *Here are some suggested sites you and your class may want to investigate for more information on nutrients.*
  - <http://www.nutrition.gov/home/index.php3>
    - Nutrition facts and information
  - <http://www.nal.usda.gov:8001/py/pmap.htm>
    - USDA Food Guide Pyramid information
  - <http://vm.cfsan.fda.gov/list.html>
    - The US FDA Center for Food Safety and Applied Nutrition
  - <http://www.nal.usda.gov/fnic/>
    - Food and Nutrition Information Center
- ◆ *Teachers: Please note that these addresses are constantly changing and being updated. You may need to revise this list.*