























Oils



# **Key Nutrients**

MyPlate is a tool to help us choose what foods to eat. Each stripe of color at left represents a food group: grains (orange), vegetables (green), fruits (red), dairy (blue), protein (purple), and oils (yellow). The proportion of each color on MyPlate represents how much each food group contributes to the overall diet. Each food group provides distinct nutrients, which the body needs to be healthy. If these nutrients are missing from meals or snacks for many days, a person can develop a nutrient deficiency, increase risk of certain diseases, become sick, or even die. This publication lists many of the nutrients we need, explains their role in keeping us healthy, and suggests food sources.

Eating a variety of foods from all of the groups on MyPlate is a fun and satisfying way to stay healthy.



## **Macronutrients**

"Macro" means large—these are the nutrients we need in large amounts. The key macronutrients are protein, carbohydrate, fat, and water.

## **Protein**

## • Description:

Protein is made up of many tiny units called amino acids. Protein is found in both animal and plant foods, but the amino acids within each varies, which affects the protein quality. High quality proteins are found in lean meat, poultry, fish, seafood, eggs, milk, and cheese.

- Functions:
  - Building blocks for bones, muscles, cartilage, skin, blood, enzymes, hormones, and antibodies
    - Enzymes help normal processes occur in our bodies.
    - Hormones send messages through our bodies.
  - Antibodies fight infection.
  - Supplies energy
- Sources: Protein is found in the protein and dairy groups.

## Carbohydrate G

### • Description:

Carbohydrate provides over half of the energy in our diet. Carbohydrates with a smaller number of glucose units are considered "sugars" whereas those with a larger number of glucose units are referred to as "starch" or complex carbohydrate.

- Functions:
  - Supplies energy and helps the body use fat as an energy source
  - Prevents protein from being used for energy so it can build and repair the body
- **Sources:** Carbohydrate is found in the grain, fruit, and vegetable groups; grains and vegetables provide primarily carbohydrate, whereas fruit provides sugar. Sugar can come from other foods including molasses, syrups, honey, and other sweets.

## Fat

## • Description:

Fat provides calories to our diet and adds texture, flavor, and aroma to food. Fat is made up of different kinds of fatty acids—saturated, monounsaturated, and polyunsaturated, which have different effects on our health.

- Functions:
  - Supplies energy in a compact form (twice as much energy as the same amount of protein and carbohydrate)
  - Stores energy for future use, which also serves as an insulator and cushions organs
  - Supplies essential fatty acids (those our bodies need but cannot make)
  - Helps body absorb and use some nutrients such as fat-soluble vitamins
  - Provides structure and function to cells as a component of the cell walls
- **Sources:** Oils, butter, margarine, salad dressing, shortening, and lard. Fat is found mainly in the oil group but also can come from food in the protein and dairy groups.

#### Water



Water is one of the most essential nutrients that keeps our bodies healthy.

- Functions:
  - Important part of all cells and fluids in the body
  - Carries nutrients to cells and wastes away from cells
  - Helps digest and absorb the food we eat
  - Helps keep body temperature constant
- **Sources:** Water, beverages, soup, fruit, and vegetables.



## Dietary Fiber G V F P

• Description:

Dietary fiber is the part of plant foods that cannot be digested by humans; it is considered a complex carbohydrate.

- Functions:
  - Adds bulk to the contents of the intestine, which can provide a feeling of fullness
  - Increases movement of intestinal contents, which may reduce constipation, diverticulosis, and other intestinal diseases
  - Helps remove cholesterol from the intestine, which reduces risk of coronary heart disease
- **Sources:** Fiber is found in the grain, vegetable, fruit, and protein groups including whole grain breads and cereals, dried beans (such as kidney and black beans), and whole fruits/vegetables.

## **Micronutrients**

"Micro" means small—these are nutrients we need in small amounts. Key micronutrients include vitamin A, thiamin (vitamin B1), riboflavin (vitamin B2), niacin (vitamin B3), folic acid, vitamin B12, ascorbic acid (vitamin C), vitamin D, vitamin E, calcium, iron, magnesium, and potassium.

## Vitamin A Description:

Vitamin A is a fat-soluble vitamin found easily in the American diet due to fortification, but may not be available to many people in other countries around the world. Beta carotene, a compound found in dark green and orange vegetables, is converted to Vitamin A by our body and also contributes to overall intake.

- Functions:
  - Helps the eyes adjust to dim light and protects against night blindness
  - Helps young cells in the body develop into mature cells
  - Keeps the skin and the lining of the mouth, nose, throat, and digestive tract healthy and resistant to infection
  - Necessary for growth, reproduction, and immune function
  - Serves as an antioxidant to protect the body's cells from damage
- **Sources:** Liver, carrots, peaches, leafy greens, sweet potatoes, broccoli, and vitamin A-fortified milk and margarine

## Thiamin (Vitamin B1) G

#### • Description:

Thiamin is a water-soluble, B vitamin found in many foods. However, it is sensitive to heat and oxygen and can be destroyed during cooking or storage. Because it is watersoluble it is easily lost when food is cooked with water.

- Functions:
  - Helps body cells release energy from food
  - Helps synthesize some other compounds needed in the body
- **Sources:** Whole grain and enriched breads and cereals, pork, heart, kidney, liver, and dry beans

## Riboflavin (Vitamin B2)

• Description:

Riboflavin is a water-soluble B vitamin found in many foods; similar to thiamin, it is easily destroyed by light and heat.

- Functions:
  - Helps release energy from protein, carbohydrate, and fat
  - Helps activate other vitamins
- **Sources:** Whole grain and enriched breads and cereals, leafy green vegetables, milk, cheese, liver, beef, poultry, fish, dry beans, and eggs

## Niacin (Vitamin B3)

• Description:

Niacin is a water-soluble B vitamin found easily in food, but also made in the human body.

- Functions:
  - Helps body cells release energy from food
  - Helps the body make cholesterol and fatty acids
  - Keeps the skin, tongue, digestive tract, and nervous system healthy
- **Sources:** Whole grain and enriched breads and cereals, tuna, poultry, beef, dry beans, nuts, and seeds

## **Folic Acid**

#### • Description:

Folic Acid is a B vitamin that also is known as folate. It is especially important for women who are pregnant or who may become pregnant to prevent neural tube birth defects including spina bifida.

- Functions:
  - Used in the synthesis of DNA and RNA in growing cells
  - Helps the body use some of the amino acids found in protein
- **Sources:** Grains fortified with folic acid, leafy greens (especially spinach), broccoli, asparagus, corn, oranges, liver, heart, kidney, dry beans, and nuts

## Vitamin B12

## • Description:

Vitamin B12 is made by bacteria that live in our large intestine. Some humans cannot absorb vitamin B12 very well and develop a type of anemia, a condition of the red blood cells.



- Functions:
  - Helps maintain myelin, a substance insulating nerves and helping nerves send messages through the body
  - Helps release energy from fatty acids
  - Maintains folic acid activity that is involved in DNA synthesis
  - Helps prevent elevated levels of homocysteine, a compound that may increase the risk of cardiovascular disease
- Sources: Milk, beef, poultry, fish, eggs

## Ascorbic Acid (Vitamin C)

• Description:

Vitamin C is a water-soluble vitamin commonly associated with citrus fruits. This vitamin can be easily destroyed by oxygen, light, and heat, so is easily lost during cooking and storage.

- Functions:
  - Strengthens the walls of blood vessels
  - Helps wounds to heal
  - Aids in building bones and teeth
  - Helps the body absorb iron
  - Works as an antioxidant to protect the body from damaging compounds in the environment
- **Sources:** Oranges, grapefruit, lemons, limes, strawberries, cantaloupe, broccoli, cauliflower, cabbage, Brussels sprouts, green leafy vegetables, peppers, tomatoes, and potatoes

## Vitamin D

• Description:

Vitamin D is sometimes called the sunshine vitamin because it is produced in the skin when it is exposed to sunlight. This vitamin is also found in Vitamin D fortified milk.

- Functions:
  - Maintains normal levels of calcium and phosphorus in the blood
  - Helps keep bones healthy
- **Sources:** sunlight, milk fortified with vitamin D, liver, salmon, and eggs

# Vitamin E Description:



Vitamin E functions as an antioxidant to protect our body from the dangers of our environment. This vitamin is found throughout our food supply, so a deficiency is rare.

#### • Functions:

- Works as an antioxidant to protect cell membranes from damaging compounds in the environment
- Helps maintain red blood cells, nerve cells, and immune cells
- Sources: Vegetable oils, leafy greens, nuts

## Calcium

## • Description:

Calcium is the mineral found in the largest amount in our bodies. The majority of calcium is found in bones and teeth. Deficiency of this mineral is often associated with the loss of bone, or osteoporosis.

- Functions:
  - Helps maintain bones and teeth
  - Helps regulate blood pressure
  - Helps blood form clots
  - Works as a messenger for nerves, muscles, and the heart to function properly
- **Sources:** Milk, yogurt, cheese, dark green leafy vegetables (broccoli, spinach, and greens), soy products with calcium added, and fish eaten with the bones (salmon canned with the bones)

#### Iron

#### • Description:

Iron is a mineral that is found mainly in the hemoglobin, the oxygen carrying component of the blood. Deficiency of iron is common and is called anemia.

- Functions:
  - As a part of hemoglobin, carries oxygen from the lungs to muscles, the brain, and other parts of the body
  - Helps protect cells from damage by environmental factors
- **Sources:** Meat, poultry, fish, leafy green vegetables, and whole grains
- Iron is found mainly in the protein group, but it is also found in the vegetable and grain groups.

## Magnesium G

#### • Description:

Magnesium is a mineral that is found in very small amounts in the body. However, it is very important in a number of body functions.

#### • Functions:

- Helps the body maintain normal levels of calcium, sodium, and potassium
- Maintains bone structure
- Helps release energy from carbohydrate, protein, and fat in the body
- Helps nerves and muscles function normally
- Involved in the synthesis of DNA and RNA
- **Sources:** Leafy greens (spinach), whole grains, nuts, and dried peas/beans

## Potassium



Potassium is a mineral that is a part of the fluid inside our cells. Our bodies closely monitor the amount of potassium present in the cells, because any deficiency or excess of potassium can cause an irregular heartbeat.

- Functions:
  - Helps transmit nerve signals throughout the body
  - Helps regulate blood pressure
- Sources: Bananas, oranges, and potatoes

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#### ... and justice for all

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