Know Your Nutrients

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Minerals

Calcium
Chromium
Copper
Flouride
Iodine
Iron
Magnesium
Phosphorus
Selenium
Zinc

Electrolytes

Sodium
Chloride
Potassium
Water

Macro Nutrients

Protein
Fat
Carbohydrates
Fiber

Fat Soluble Vitamins

Vitamin A
Vitamin D
Vitamin E
Vitamin K

Water Soluble Vitamins

Vitamin C
Vitamin B1 (Thiamin)
Vitamin B2 (Riboflavin)
Vitamin B6
Vitamin B12
Niacin
Folate

Texas A&M AgriLife Extension

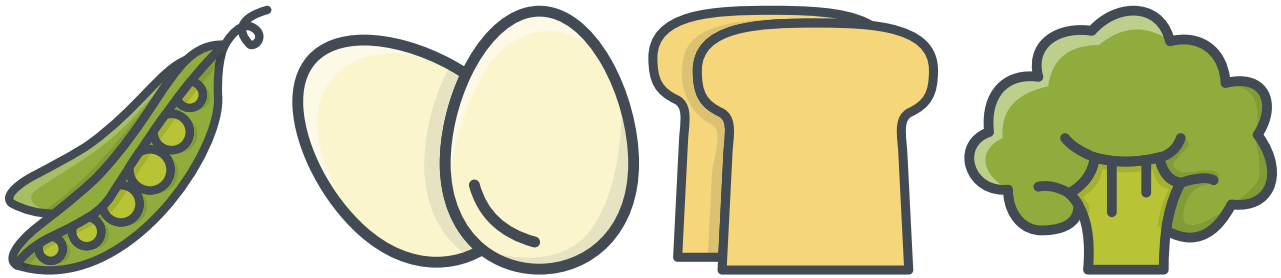
MACRO NUTRIENTS

PROTEIN
FAT
CARBOHYDRATE
FIBER

LET'S TAKE A CLOSER LOOK...

PROTEIN		FIBER	
AMINO ACIDS Protein is found in plant and animal foods. Protein is made up of units called amino acids, which are linked to one another in long chains. The sequence of amino acids determines each protein's unique structure and function. There are 20 different amino acids in two categories:		**DIETARY FIBER** Dietary fiber, or fiber, is a type of carbohydrate found in plant foods. Dietary fiber is bound together in such a way that it cannot be readily digested in the small intestine. There are two classifications of dietary fiber:	
ESSENTIAL AMINO ACIDS are required for normal body functioning, but cannot be made by the body. They must be obtained from food. Nine are considered essential.	**NONESSENTIAL AMINO ACIDS** can be made by the body from essential amino acids consumed in food or in the normal breakdown of body proteins. Eleven are considered nonessential.	**SOLUBLE FIBER** dissolves in water to form a thick gel-like substance in the stomach. It is broken down by bacteria in the large intestine and provides some calories.	**INSOLUBLE FIBER** does not dissolve in water and passes through the gastrointestinal tract relatively intact and, therefore, is not a source of calories.

FOOD SOURCES



MACRO NUTRIENTS	**FUNCTION:** *What does it do?*	**SOURCES:** *Where is it found?*	**DEFICIENCY:** *What happens if I don't get enough?*
Protein	• Builds and repairs all body tissue • Helps build blood • Helps form antibodies to fight infection • Supplies energy at 4 calories per gram	• Animal Protein: meat, fish, poultry, eggs, milk, cheese, yogurt • Nuts and nut butters • Soy • Vegetable Protein: legumes (peas, beans), whole grain breads and cereals	• Fatigue • Loss of appetite • Edema • Poor growth
Fat	• Transports fat-soluble vitamins (A,D,E,K) and essential fatty acids needed for body's proper use and storage of fat • Supplies energy at 9 calories per gram	• Butter or Margarine • Egg yolk • Meat with fat • Shortening or oil • Palm and coconut oil • Salad dressing • Whole milk dairy products	• Eczema • Stunted growth • Diarrhea • Loss of hair
Carbohydrate	• Supply glucose to spare protein • Help the body use other nutrients • Good source of energy • Supplies energy at 4 calories per gram to all body cells	• Bananas • Breads and cereals • Corn • Dried fruits • Flours and cornmeal • Honey • Pasta • Potatoes and sweet potatoes • Sugar, syrup, jam, and jellies • Rice	• Loss of energy • Fatigue • Ketosis
Fiber	• May help lower cholesterol • Improves bowel motility (moves food through digestive tract) • Gives feeling of fullness without extra calories, promoting satiety and weight loss	• Beans • Broccoli • Carrots • Enriched grain products such as: cereals, bread, noodles, tortillas, brown rice, oatmeal • Peas • Spinach • Whole grains	• Diarrhea

WATER SOLUBLE VITAMINS

VITAMIN C
VITAMIN B1
(THIAMIN)
VITAMIN B2
(RIBOFLAVIN)
NIACIN
VITAMIN B6
VITAMIN B12
FOLATE

LET'S TAKE A CLOSER LOOK...

Vitamins

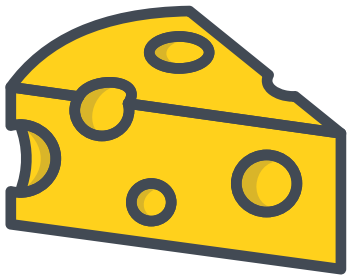
Vitamins are essential substances that the human body needs for proper growth, development, and function. Vitamins are organic substances which are made by plants and animals and then eaten by humans..

There are 13 known vitamins:
A,C,D,E,K, and the B vitamins (thiamin (B1), riboflavin (B2), niacin (B3), pantothenic acid (B5), pyridoxal (B6), cobalamin (B12), biotin, and folate/folic acid.
Vitamins are classified as water soluble and fat-soluble.

Water Soluble Vitamins

Water Soluble vitamins require water for absorption into the body.
The body flushes out excess water soluble vitamins in the urine.

FOOD SOURCES



WATER SOLUBLE VITAMINS	FUNCTION: *What does it do?*	SOURCES: *Where is it found?*	DEFICIENCY: *What happens if I don't get enough?*
Vitamin C	• Antioxidant • Collagen and connective tissue formation • Immune function • Wound healing • Promotes iron absorption	• Broccoli and brussels sprouts • Citrus fruits and juices • Green leafy vegetables • Green or red peppers • Kiwifruit or strawberries • Tomatoes	• Sore or bleeding gums • Poor wound healing • Pain in joints, bones, & muscles • Bruising easily • Hair and tooth loss
Vitamin B1 (Thiamin)	• Helps produce energy from carbohydrates in all cells • Nervous system function	• Beans, Peas and Lentils • Nuts and seeds • Pork • Whole and enriched grain products	• Poor appetite • Constipation • Depression • Cardiac failure
Vitamin B2 (Riboflavin)	• Helps produce energy from carbohydrates in all cells • Growth and development • Red blood cell formation	• Eggs • Enriched grain products • Meats, poultry, and seafood • Milk and Yogurt • Mushrooms	• Sore tongue and mouth, swelling also • Burning and itching eyes
Niacin	• Cholesterol production • Helps produce energy from carbohydrates in all cells • Digestion • Nervous system function • Promotes normal appetite	• Beans • Beef • Nuts • Pork, poultry, and seafood • Whole and enriched grain products	• Loss of appetite • Diarrhea • Dermatitis (skin irritations) • Confusion and Disorientation • Anxiety
Vitamin B6	• Immune function • Nervous system function • Protein, carbohydrate, and fat metabolism • Red blood cell formation • Turns tryptophan into niacin	• Chickpeas • Fruits (other than citrus) • Potatoes • Salmon • Tuna	• Anemia • Nervous irritability • Dermatitis (skin irritations) • Convulsions • Weakness • Abdominal pain
Vitamin B12	• Conversion of food into energy • Nervous system function • Red blood cell formation • Regeneration of folate	• Dairy Products • Eggs • Fortified cereals • Meats, poultry, and seafood	• Anemia • Nerve damage
Folate	• Prevents neural tube defects (birth defects) • Red blood cell formation	• Asparagus • Avocado • Beans and peas • Green leafy vegetables • Orange juice	• Anemia • Fatigue • Brain and Spinal cord defects in infants due to mother's deficiency during pregnancyw

FAT SOLUBLE VITAMINS

VITAMIN A
VITAMIN D
VITAMIN E
VITAMIN K

LET'S TAKE A CLOSER LOOK...

Vitamins

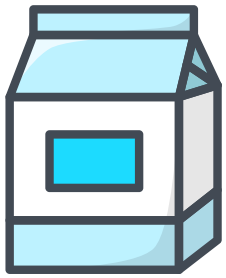
Vitamins are essential substances that the human body needs for proper growth, development, and function. Vitamins are organic substances which are made by plants and animals; they are then eaten by humans.

There are 13 known vitamins:
A,C,D,E,K, and the B vitamins (thiamin (B1), riboflavin (B2), niacin (B3), pantothenic acid (B5), pyridoxal (B6), cobalamin (B12), biotin, and folate/folic acid.
Vitamins are classified as water soluble and fat-soluble.

Fat Soluble Vitamins

Fat soluble vitamins require fat for absorption and are stored in the liver and adipose (fatty tissue) of the body. By storing fat soluble vitamins in fatty tissues, the body can tap into these reserves when needed. Fat soluble vitamins are not excreted easily and when eating excess amounts levels can build up and become toxic.

FOOD SOURCES



FAT SOLUBLE VITAMINS	FUNCTION: *What does it do?*	SOURCES: *Where is it found?*	DEFICIENCY: *What happens if I don't get enough?*
Vitamin A	• Normal cell growth and development • required for immune function • supports reproduction • Promotes vision • Protects from infections • Red blood cell formation • Skin and bone formation • Helps keep skin healthy	• Cantaloupe • Carrots • Dairy products • Eggs • Fortified cereals • Green leafy vegetables • Pumpkin • Red peppers • Sweet potatoes	• Faulty bone and tooth development in infants • Poor growth • Night blindness
Vitamin D	• Promotes absorption of calcium and phosphorus • Helps keep bones and teeth strong • Helps cell growth • Immune function • Nervous system function	• Eggs • Exposure to sunlight • Fish • Fish liver oil • Fortified cereals and dairy products • Fortified orange juice • Fortified soy beverages	• Rickets (soft, fragile bones, enlarged joints, bowed legs) • Chest, spinal and pelvic bone deformities • Convulsions
Vitamin E	• Formation of red clood cells • Acts as an antioxidant to protect essential fatty acids and vitamin A	• Fortified cereals and juices • Green vegetables • Nuts and seeds • Peanuts and peanut butter • Vegetable oils	• Anemia in premature infants • Problems of nervous system
Vitamin K	• Assists in blood clotting • Regulates calcium metabolism	• Butterfat (is synthesized in intestine by beneficial bacteria) • Deep green leaves (alfalfa, spinach, cabbage) • Egg yolk • Liver	• Impairs blood clotting • May reduce bone strength

MINERALS

CALCIUM
CHROMIUM
COPPER
FLOURIDE
IODINE
IRON
MAGNESIUM
PHOSPHORUS
SELENIUM
ZINC

LET'S TAKE A CLOSER LOOK...

MINERALS

Minerals are essential substances that the human body needs for proper growth, development, and function. Minerals are inorganic substances that are not made by living things, but rather are found naturally in soil and water.
Minerals are absorbed by plants which are then eaten by humans or other animals. Humans can obtain minerals through plants or by eating animal products.

Only some minerals (listed below) are essential for body processes and functions. The other trace minerals not listed are not essential for the body and fuctions.
Minerals can be broken down into two categories:

MAJOR MINERALS
(needed in 100 milligrams per day or more)

calcium
phosphorus
magnesium
sulfur

TRACE MINERALS
(required in much smaller amounts by the body)

iron
iodine
zinc
chromium
maganese
selenium
fluoride
copper

FOOD SOURCES

MINERALS	FUNCTION: *What does it do?*	SOURCES: *Where is it found?*	DEFICIENCY: *What happens if I don't get enough?*
Calcium	• Blood clotting • Bone and teeth formation • Muscle and heart contraction • Nervous system function	• Dried peas and beans • Fortified juice and soy milk • Greens (kale, broccoli, collards, etc.) • Milk and dairy products	• Abnormal heart rhythms • Fragile bones • Osteoporosis
Chromium	• Insulin function • Protein, carbohydrate, and fat metabolism	• Broccoli • Fruits and fruit juices • Meats and turkey • Whole grains	• Inability of cells to use glucose for energy
Copper	• Collagen and connective tissue formation • Aids in red blood cell formation from iron stores • Nervous system function	• Crustaceans and shellfish • Nuts and Seeds • Organ meats such as liver • Whole grains and Lentils	• Anemia
Flouride	• Makes teeth resistant to decay; most effective in young children	• Water (1 part per million is added to some municipal water supplies)	• None known
Iodine	• Growth and development • Metabolism • Thyroid hormone production	• Iodized table salt (76 ug/g of salt) • Seafood	• Stunted growth • Endemic goiter
Iron	• Growth and development • Immune function • Red blood cell formation • Helps change beta carotene to vitamin A • Produces collagen	• Beans and peas • Dark green vegetables • Meats, poultry, and seafood • Raisins • Whole grain, enriched, and fortified breads	• Anemia
Magnesium	• Immune function • Muscle contraction • Normal heart rhythm • Aids in making body proteins • Structural component of bones and teeth • Regulates blood glucose levels and blood pressure	• Avocados and Potatoes • Bananas • Beans and peas • Dairy products • Green leafy vegetables • Nuts and seeds • Wheat bran and whole grains	• Tremors • Growth failure
Phosphorus	• Builds strong bones and teeth • Energy production and storage	• Beans and peas • Dairy products • Meats, poultry, and seafood • Nuts and seeds • Whole grain, enriched, and fortified breads	• Bone loss • Pain
Selenium	• Antioxidant • Promotes immune function • Promotes thyroid function	• Eggs • Enriched pasta and rice • Meats, poultry, and seafood • Nuts and seeds • Whole grains	• Brittle hair and nails • Hair loss
Zinc	• Promotes tissue growth and development • Immune function • Nervous system function • Protein formation • Wound healing	• Beans and peas • Beef, poultry, and seafood • Dairy products and fortified cereals • Nuts • Whole grains	• Poor wound healing • Decresed taste ability

ELECTROLYTES

SODIUM
CHLORIDE
POTASSIUM
WATER

LET'S TAKE A CLOSER LOOK...

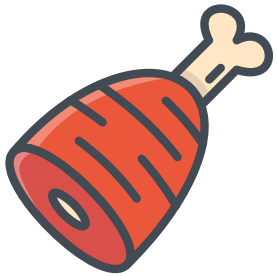
Electrolytes

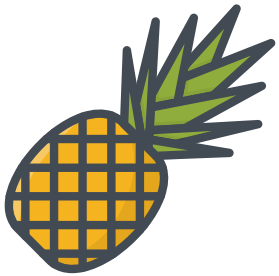
Electrolytes are minerals in body fluids such as blood, tissues, sweat and urine.
Electrolytes help to transmit nerve impulses in your body.
Electrolytes include sodium, potassium, and chloride.
When dehydrated, the body does not have enough fluid and electrolytes to function properly.

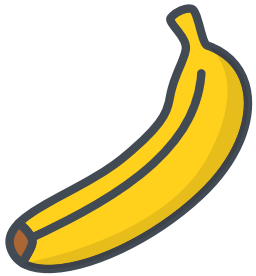
Electrolytes help:

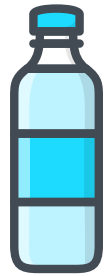
- Balance the amount of water in the body
- Balance the body's acid/base (pH) level
- Move nutrients to cells
- Move wastes out of cells
- Help nerves, muscles, the heart, and brain function properly

FOOD SOURCES









ELECTROLYTES	FUNCTION: *What does it do?*	SOURCES: *Where is it found?*	DEFICIENCY: *What happens if I don't get enough?*
Sodium	• Regulates fluid balance • Influences blood pressure and blood volume • Muscle contraction • Nervous system function	• Breads and rolls • Cheese • Cold cuts and cured meats • Mixed meat dishes • Mixed pasta dishes • Pizza • Poultry • Sandwiches • Savory snacks • Soups • Table Salt	• Fatigue • Profuse sweating • Muscle cramps • Dizziness • Nausea • Diarrhea
Chloride	• Regulates fluid balance • Helps nerve transmission.	• Celery • Green leafy vegetables • Lettuce • Olives • Pineapple • Rye • Table salt and sea salt • Tomatoes	• Heat cramps • Hair loss • Tooth loss • Muscle cramps
Potassium	• Normalizes blood pressure regulation • Regulates fluid balance • Muscle contraction • Nervous system function	• Bananas and most fruits • Dairy products • Dried peas • Meats • Orange juice • Peanuts and other nuts • Potatoes • Spinach • Yogurt	• Weakness • Poor muscle tone • Heart abnormalities • Muscle cramps • Loss of appetite
Water	• Transports nutrients • Transports waste • Lubricates joints • Regulates body temperature • Cell hydration	• High-moisture solid foods such as: soups, watermelon, and meats • Juices • Water	• Dehydration • Constipation

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