

Vitamin Basics



Thank you for your interest in **Vitamin Basics**. This nutritional educational packet contains a 10 page study guide, as well as a self test/training certificate, which fulfills two hours of training. This certificate is only valid if the self-test on the backside is completed. You are expected to review the enclosed materials thoroughly prior to completing the self-test. Answers to all questions are contained in the accompanying study guide. ***Remember, the training certificate is only valid after review of the enclosed materials and completion of the self test.***

If you have any questions as to the proper use of this packet, please contact the ICCB office and we will be glad to assist you.

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Vitamins are essential nutrients that our bodies need in small amounts to work properly. There are two types of vitamins: fat-soluble and water-soluble.

Fat Soluble Vitamins

Fat-soluble vitamins are found mainly in fatty foods such as animal fats (including butter and lard), vegetable oils, dairy foods, liver and oily fish.

Your body needs these vitamins every day to work properly. However, you don't need to Eat foods containing them every day.

This is because, if your body doesn't need these vitamins immediately, it stores them in your liver and fatty tissues for future use. This means the stores can build up so they are there when you need them. But, if you have much more than you need, fat-soluble vitamins can be harmful.

These are all fat-soluble vitamins:



vitamin A
vitamin D
vitamin E
vitamin K

Water Soluble Vitamins

Water-soluble vitamins are not stored in the body, so you need to have them more frequently.

If you have more than you need, your body gets rid of the extra vitamins when you urinate. Because the body doesn't store water-soluble vitamins, generally these vitamins aren't harmful.

Water-soluble vitamins are found in fruit, vegetables and grains. But unlike fat-soluble vitamins, they can be destroyed by heat or by being exposed to the air. They can also be lost in the water used for cooking.

This means that by cooking food, especially boiling, we lose lots of these vitamins from the food we eat. The best way to keep as much of the water-soluble vitamins as possible is to steam or grill, rather than boil.

These are all water-soluble vitamins:



vitamin B6
vitamin B12
vitamin C
biotin
folic acid
niacin
pantothenic acid



What are minerals?

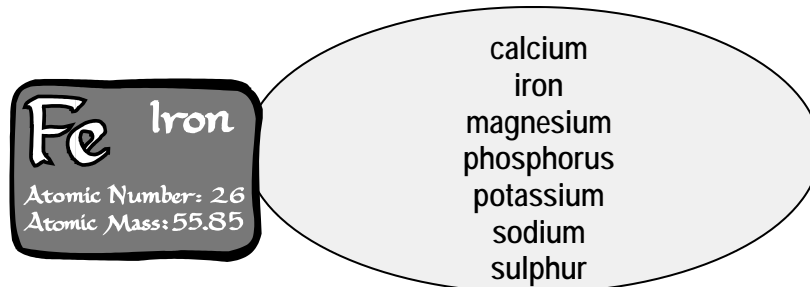
Minerals are essential nutrients that your body needs in small amounts to work properly. We need them in the form they are found in food.

Minerals can be found in varying amounts in a variety of foods such as meat, cereals (including cereal products such as bread), fish, milk and dairy foods, vegetables, fruit (especially dried fruit) and nuts.

Minerals are necessary for three main reasons:

- 1 - building strong bones and teeth
- 2 - controlling body fluids inside and outside cells
- 3 - turning the food we eat into energy

These are all essential minerals:



What are trace elements?

Trace elements are also essential nutrients that your body needs to work properly, but in much smaller amounts than vitamins and minerals.

Trace elements are found in small amounts in a variety of foods such as meat, fish, cereals, milk and dairy foods, vegetables and nuts.

These are all trace elements:



How Much for Good Health?

Determining just how much of various vitamins and minerals people need for good health is a tricky science. For more than half a century, federal recommended dietary allowances (RDAs) spotlighted a combination of nutrients aimed at preventing deficiency diseases in most people. But the dietary reference intakes (DRIs) from the Institute of Medicine, which replaced the familiar RDAs, ushered in considerable change. Whereas the RDAs were established to prevent deficiency diseases, the DRIs seek also to enhance health and lower the risk for chronic conditions such as heart disease and cancer. This shift in focus reflects the fact that few people in industrialized countries today are deficient in nutrients, but many die from major diseases that could be prevented with better diets. The guidelines acknowledge that the need for certain nutrients varies with people's age, sex, and other important characteristics.



There are 13 vitamins and 16 minerals that your body needs but cannot manufacture in sufficient amounts. Acting in concert, these essential vitamins and minerals help keep billions of cells healthy and encourage them to grow and reproduce. Some supply the keys to unlocking the energy in the carbohydrate, fat, and protein in the foods you eat. These essentials are often called micronutrients because your body needs only tiny amounts of them. Yet failing to get even those small quantities virtually guarantees disease.

Old-time sailors learned that living for months without fresh fruits or vegetables — the main sources of vitamin C — causes the bleeding gums and listlessness of scurvy. In some developing countries, people still become blind from vitamin A deficiency. And even in the United States, some children develop the soft, deformed bones of rickets because they don't get enough vitamin D.

While the absence of key micronutrients hampers good health, their presence in sufficient quantities promotes it. Getting a full complement of iron helps proteins in your blood and muscles pick up and release the oxygen that's vital to all of your cells. It also fends off the absorption of lead, a heavy metal that can cause widespread damage. The B vitamin folic acid can be a powerful agent in protecting against birth defects and may help ward off heart disease and some forms of cancer. And a combination of calcium, vitamin D, vitamin K, magnesium, and phosphorus protects your bones against fractures.



Many of these micronutrients interact with one another. Vitamin D enables your body to pluck calcium from food sources passing through your digestive tract. Vitamin C helps you absorb iron. Vitamins and minerals differ in basic ways. Vitamins can be broken down by heat, air, or acid. Minerals are chemical elements that do not change. That means the minerals in soil and water easily find their way into your body through the plants, fish, animals, and fluids you consume. But it's tougher to shuttle vitamins from food and other sources into your body because cooking, storage, and simple exposure to air can inactivate these more fragile nutrients.

Vitamin Quick Facts...

- Healthy people can obtain all the vitamins and minerals they need from eating a variety of foods.
- Taking supplements does not guarantee protection against disease.
- Large doses of either single nutrient supplements or high potency vitamin-mineral combinations may be harmful.
- Vitamin deficiency is rare unless a person's diet is limited and lacks variety.
- Do not take self-prescribed single nutrient supplements without first consulting a physician or registered dietitian.

With so much confusion about the food we eat, the following questions and related myths explain the value of food in comparison to vitamin and mineral supplement pills.

Food vs. Supplemental Vitamins

About 68 percent of American adults take a multivitamin supplement each day because they think the food they eat lacks needed nutrients. With the quality and variety of food available in the United States, however, healthy people can get the vitamins and minerals they need from food alone.

Whole foods supply a unique balance of nutrients that cannot be duplicated by taking any combination of supplements. In addition, eating is one of life's pleasures. However, it is evident by supplement sales totaling over \$23.7 billion a year that much is invested in the hope that supplements will help.

Most nutritionists concur that whether or not someone should take a vitamin supplement depends on whether or not that person's diet contains enough food and variety to supply all the nutrients your body needs.

If an adult eats more than 1600 calories and a variety of food, taking a multi-vitamin may be a waste of money and making some very expensive urine. Though, taking one multivitamin per day that has 100% of the Recommended Dietary Allowances for vitamins and minerals will not hurt you.

If you are consuming less than 1600 calories per day, you are not getting all the vitamins and minerals you need. In that case, I would suggest you take a multivitamin that has 100% of the RDA for all vitamins and minerals.

Your body prefers to extract the vitamins and minerals from whole foods and excretes excess vitamins and minerals from supplements via urine or feces. There is however research to support higher than normal intakes of some vitamins or minerals for specific disease prevention or treatment.

Myth or Fact

With so much confusion about the food we eat, it is important to understand that food is so much more valuable in meeting our vitamin and mineral requirements than vitamin pills. However, many Americans consume more calories than they need without meeting recommended intakes for a number of nutrients. This circumstance means that most people need to choose meals and snacks that are high in nutrients but low to moderate in energy content. Doing so offers important benefits - normal growth and development of children; health promotion for people of all ages, and reduction of risk for a number of chronic diseases that are major health problems.

A major premise of the Dietary Guidelines for Americans is that the nutrients that we need should come primarily from foods. Foods contain not only the vitamins and minerals that are often found in supplements but also hundreds of naturally occurring substances, including carotenoids, flavonoids and isoflavones, and protease inhibitors that may protect against chronic health conditions.

If the multivitamin has only 100% of the Recommended Dietary Allowances (RDA) for each nutrient in the supplement, it probably won't hurt you. Your body can absorb around 10 to 15% of the nutrients in a vitamin pill. The rest is excreted in urine or feces. So for every \$10.00 you spend on supplements, you could be flushing \$8.50 down the toilet. One may deduce that this money would be better spent on food.

Myth: People can eat whatever they want as long as they take vitamin and mineral supplements.

Fact: Supplements supply some vitamins and minerals, but they do not provide all of the components of food necessary for good health. We need 42 nutrients each day. Supplements supply only a fraction of these and are not a quick fix for poor food choices.

Myth: People need vitamin and mineral supplements to ensure good nutrition.

Fact: Supplements are not needed if a variety of foods are eaten. Taking in more nutrients than the body needs does not give added energy, more brain power or greater protection against disease.

Myth: Natural vitamins are better for you than synthetic vitamins.

Fact: The body treats most natural supplements the same as synthetic vitamins.

Myth: Supplements with added enzymes are easier to digest.

Fact: Supplements with added enzymes to aid digestion are unnecessary. The body makes its own digestive enzymes.

Myth: Timed-release supplements help absorption.

Fact: Actually, timed-release supplements are absorbed less efficiently than tablets, chewables or solutions.

Myth or Fact

Can Vitamins and Mineral Supplements Promote Health and Prevent Disease?

Vitamins and minerals will prevent diseases associated with nutritional deficiencies such as scurvy, beriberi, pellagra and rickets. These diseases, however, are rare in the United States because the foods we eat are good sources of the needed nutrients.

The diseases that plague today's Americans are chronic diseases not caused by specific nutrient deficiencies. Heart disease, cancer, diabetes and high blood pressure are affected by many factors, one of which is eating patterns. If people eat a variety of foods in adequate and moderate amounts, supplements will not give added protection.

Myth: Taking supplements that contain antioxidants such as vitamins A and C, beta carotene, vitamin E or selenium will prevent cancer.

Fact: Research from a decade ago suggested that taking antioxidant supplements might help protect against cancer. However, newer findings from clinical studies indicate that taking antioxidant pills does not offer protection against cancer, and may even do some harm. On the other hand, eating lots of food rich in antioxidants, such as green vegetables, citrus fruits, deep-orange colored produce as well as other types of fruits and vegetables has been shown to be protective.

Myth: Antioxidant supplements prevent heart disease.

Fact: Several clinical studies have shown no benefit in taking antioxidant pills to prevent heart disease. Most of the research thus far, however, has been on people who already have heart disease. Several studies have looked at antioxidants, especially vitamin E, and have found no protective effect against heart disease (and may even increase the risk of heart failure). The results from clinical studies do not support antioxidant supplement use.

Myth: Osteoporosis can be prevented by taking calcium supplements.

Fact: Many factors contribute to the development of osteoporosis, one of which is calcium. Estrogen levels, exercise, gender, body size, smoking, race and heredity are all important aspects that relate to osteoporosis. The most effective treatment in postmenopausal women may be a combination of extra calcium, vitamin D, exercise and estrogen.

Myth: Vitamin B-15 (pangamic acid), vitamin B-17 (laetrile), and vitamin P (bioflavonoids) are new vitamins that prevent disease.

Fact: These are not vitamins and have not been shown to prevent cancer, help athletes' performance or promote health.

Myth or Fact

Can Vitamins and Mineral Supplements Promote Health and Prevent Disease?

Myth: Vitamin B-6 will alleviate PMS (premenstrual syndrome).

Fact: The evidence supporting this is thin. Two studies in 2007 have shown some benefit for reducing symptoms. Many factors are associated with PMS, and one critical factor is the importance of eating well and regularly.

Myth: Zinc shortens the amount of time that you have a cold.

Fact: Zinc, especially in the form of zinc lozenges, has shown mixed results. Too much zinc may depress the body's immune system. Most experts recommend no more than 40 mg of zinc per day.

Can Supplements Be Dangerous?

Large doses of either single-nutrient supplements or high potency vitamin-mineral combinations may be harmful. These megavitamins may contain 10 to over 100 times the Dietary Reference Intake (DRI) for a vitamin or mineral and can act like drugs with potentially serious results.

Taken in high amounts, some supplements may produce undesirable effects such as fatigue, diarrhea and hair loss. Others may cause more severe side effects such as kidney stones, liver or nerve damage, birth defects, or even death. At high levels, single-nutrient supplements function as a drug in the body and not as a nutrient.

Fat-soluble vitamins such as vitamins A and D are harmful in high doses. Water-soluble vitamins have commonly been thought to be harmless. Recent research, however, shows that vitamin B-6, A water-soluble vitamin, can cause nerve damage at the high doses prescribed for PMS. Large Amounts of vitamin C can cause diarrhea and nausea.

Many factors influence toxicity. Supplement potency, dose (number and frequency), body size and how long the supplement is taken all influence whether a supplement can be toxic.

Myth: Supplements would not be on the market if they weren't safe.

Fact: Currently, there is no pre-market approval of vitamin-mineral supplements. The FDA cannot limit the quantity or concentration of nutrients that a single pill can contain. The only exception is folacin. FDA requires supplement companies to test their ingredients.

Myth: There is no harm in taking supplements; after all, they contain the same nutrients as in foods.

Fact: Very high doses of many vitamins such as A, C, D and B-6, as well as several minerals, can cause serious health problems if taken regularly. Excesses of one nutrient may cause nutritional imbalances or increase the need for other nutrients. Some supplements interfere with the action of medications, creating a variety of ill effects.

Myth or Fact

Who Needs Supplements?

National food consumption data and dietary surveys show that the majority of Americans get the nutrients they need through food alone. Some nutrients, like calcium and iron, may require careful food selection but can be obtained from adequate amounts of foods.

Certain individuals have special needs and may benefit from taking a supplement. They include the following:

- People with limited food intake, such as chronic dieters and some elderly, have difficulty meeting their nutrient needs.
- Some vegetarians, especially strict vegans who eat no meat, dairy products or eggs, may not receive adequate amounts of iron, calcium, zinc and vitamin B-12.
- Individuals with certain diseases or physiological conditions may require supplementation.
- Newborn infants are given vitamin K to help their blood clot.
- Pregnant or breastfeeding women require higher levels of many nutrients, especially folacin, iron and calcium.

Adequate folate is particularly important before pregnancy and during the first trimester to prevent neural tube defects. A supplement is sometimes needed for folate and iron. The addition of folic acid to grains and cereals helps to increase the amount of folate people can obtain from foods.

Individual recommendations for supplementation should come from a physician or a registered dietitian. If you have a special need for iron or calcium and are taking it in pill form, The following information will be helpful:

Calcium

To estimate the absorbability of calcium tablets or multivitamins that contain calcium, place the tablet in 6 ounces of vinegar for 30 minutes. If it disintegrates, the calcium in the pill can be effectively absorbed by your body.

Check the label to see if the supplement meets disintegration standards of the U.S. Pharmacopoeia (USP), which establishes quality standards for drugs and health care products. For the best quality, choose brand names or large chain-store brands. Avoid tablets containing bone meal or dolomite, which may be contaminated with lead.

Calcium is best absorbed in several doses, rather than all at once. The most popular calcium supplement, calcium carbonate, contains more calcium per tablet than calcium lactate, calcium gluconate or calcium citrate. Be sure to take calcium carbonate with meals because stomach acids help calcium absorption. Chewable tablets are fairly inexpensive sources of calcium.

Calcium from food is better absorbed and used than calcium from pills. The best food sources of calcium are low-fat milk, cheese, yogurt, and canned fish with edible bones such as sardines and salmon. Tofu, some dry beans, tortillas made with lime-processed cornmeal, and dark green leafy vegetables like broccoli, kale and collards also provide calcium. Spinach is high in oxalates and its calcium is not absorbed well.

Myth or Fact

Iron

The most common iron supplement is ferrous sulfate, although other ferrous salts such as ferrous lactate, fumarate, glycine sulfate, glutamate and gluconate are also absorbed well. Ferrous succinate may have a 30 percent higher absorption rate than ferrous sulfate.

If you take iron tablets on an empty stomach, you get the best absorption but you also may experience constipation, diarrhea or stomach upset, depending on the dosage. Taking iron supplements with meals reduces iron absorption by up to one-third.

Vitamin C aids iron absorption whether the iron comes from food or a pill. Try meal combinations such as orange juice and iron-fortified cereal or salsa and bean burritos. Other good food sources of iron are meat, dried apricots, and iron-fortified bread.

Keep supplements out of the reach of children. Eating iron-containing drugs is the most common cause of poisoning deaths in young children.

People Who Need Supplements

The suggestion to buy nutrition insurance in pill form is appealing, but advertising is deceptive. Advertisers list all the terrible things that can happen if the diet is lacking, but never that vitamin deficiency is rare unless a person's diet is extremely unbalanced and lacks variety. Most important, they never tell how to measure whether or not the diet is adequate. If they did, they'd lose customers.

Determining dietary adequacy actually is quite easy. People can get an adequate amount of all essential nutrients by eating a variety of foods they enjoy and can afford. Eating well need not be expensive and should be pleasurable.

Myth: People under emotional stress need "stress" vitamins.

Fact: Emotional stress does not increase nutrient needs. In fact, some companies have been required to stop advertising their products as stress vitamins. Unfortunately, other companies continue to make these false claims. Physiological stress, such as burns, trauma and surgery, do increase nutrient needs, and a supplement may be prescribed.

Myth: Those who smoke or drink in excess should take vitamin pills to protect their body from the harmful effects of smoking and drinking.

Fact: Smoking does increase the body's need for vitamin C, and alcohol can interfere with the body's ability to use several nutrients. However, taking additional vitamins and minerals will not protect people from the harmful effects of smoking or alcohol abuse.

Myth: Competitive athletes and others who exercise regularly should take extra vitamins and minerals.

Fact: Athletes and fitness buffs are less likely to need supplements than anyone! When a person eats more calories to meet increased demands, the small amount of extra nutrients needed are easily supplied.

Myth or Fact

Taking Supplements

Healthy people who take supplements should limit supplement potency to 100 percent or less of the Dietary Reference Intake (DRI) for their age and gender. Self-prescribed high dosages of supplements can be potentially dangerous and cannot guarantee good health.

Myth: Taking supplements is an inexpensive way to ensure good health.

Fact: The \$27.3 billion Americans spend on supplements is a lot of money. Because the body has limited storage for most of these nutrients, they are excreted and go down the drain. The most cost-effective way to promote good health is to exercise regularly and eat a wide selection of foods.

Foods that Pack a Nutrient Punch!

Whole Grains
Fortified Cereals
Grapefruit
Oranges
Carrots, sweet potatoes, apricots
Strawberries
Green Peppers
Spinach, collard greens, Kale
Broccoli
Cauliflower
Low fat milk, cheeses and yogurt
Brazil nuts, almonds, walnuts
Tomatoes
Lean meats, poultry, fish
Avocados
Lentils, beans, chick peas
Eggs

Variety is the Spice of Life

Eat many different foods to ensure that your body receives
ALL that is required to maintain optimal health.