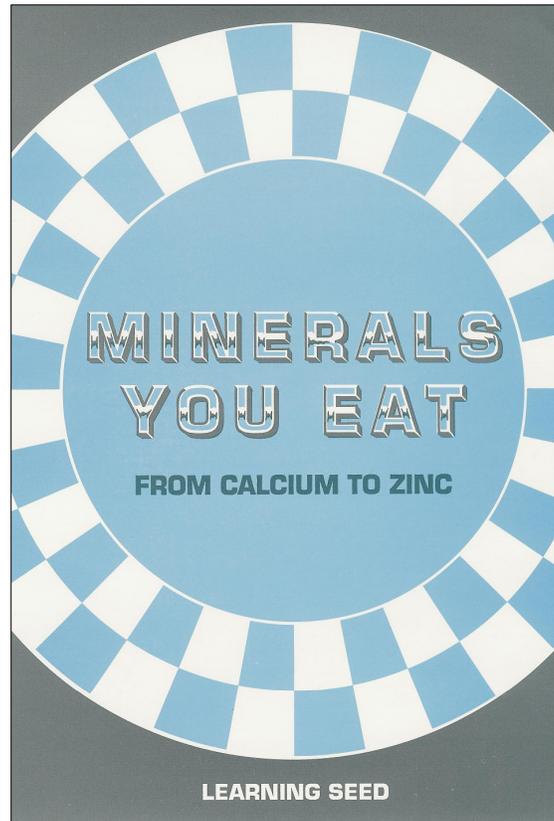


# Minerals You Eat



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# **The Program**

## **Summary**

Ask your students if they ate their copper and zinc today and you would get some strange looks. They find it hard to believe we really need to eat what they think of as rocks and metal. But humans contain about four pounds of essential minerals that must be obtained through food. Viewers learn about both macrominerals and trace elements in this fast moving program.

# Common Misconceptions About Minerals

**The good chemical / bad chemical myth:** Many students have a simplistic view that some chemicals are bad and others good. They would probably agree lead is bad and iron is good. In reality, both are essential to life in small amounts and toxic in larger quantities. Each mineral has a valley of safety. Too little produces deficiency symptoms, too much can poison.

**If a little is good, more is better:** The key to dietary minerals is **balance**. Taking a supplement of one mineral (usually in the mistaken belief it will build muscle or increase energy) often creates a new problem by "bumping out" supplies of another. More isn't better, balance is better. The key to sufficient minerals is a varied diet of "real" foods.

Many believe that minerals and vitamins make them healthier, stronger, and more likely to live longer. This mistaken belief makes them susceptible to pop "health" pills mixing herbs and minerals. Minerals (and vitamins) can restore health to those who lack them. But these deficiencies are rare and should be diagnosed by a doctor. A bigger worry is a toxic overdose through self-prescribed supplements. The "valley of safety" for chromium is very narrow. Only a couple of times the normal amount can be toxic. These supplements are not food nor medicine so are largely unregulated by the federal government.

**Calcium deficiency is a problem for old folks.** Many elderly have thin, brittle bones. But the real problem begins with children. Young people store 99% of dietary calcium in bones and teeth. After age 21, people draw on these built up reserves. So teenage girls who drink diet cola instead of milk (to keep their weight down) risk not getting enough calcium in the crucial bone-building years. One common myth causes many to blame women who fracture a bone in a fall with poor dietary habits. Weak and broken bones are caused by a variety of factors including smoking, hormones, age, and exercise.

**Calcium makes your bones stronger.** Many people believe calcium is to bones what exercise is to muscles. Not true. Bones are made of calcium and a lack of calcium can lead to weak bones in old age, but taking excess calcium does not make bones stronger.

**Iron builds strength.** Your body holds about a teaspoon of iron to help carry oxygen both in muscles and blood. Iron deficiency does cause fatigue, but the symptoms take years to develop. Believing you will gain strength from iron supplements is like believing you will gain speed by eating cheetah meat. Too much iron can be a problem. The leading cause of fatal poisoning for children under six is iron supplements mistaken for candy.

# Macrominerals

<u>Mineral</u>	<u>Why We Need It</u>	<u>Food Sources</u>	<u>Comments</u>
<b>Calcium</b> RDA for ages 11-24 is 1200-155 milligrams daily	To form and maintain bones and teeth. About 3 pounds of a 160 pound person is calcium.	Milk and dairy products, dried leafy greens.	Without Vitamin D, the body cannot store calcium. Pregnancy increases by 50%.
<b>Phosphorus</b> RDA for ages 11-24 is 1200 milligrams daily.	Works with calcium. Cells can't grow without phosphorous. Helps transport fat.	High protein foods (cheese, eggs, milk, meat, fish, fowl).	Too much soda pop and meat might upset calcium/phosphorus balance.
<b>Magnesium</b> RDA for men 350 mg. for women 280 mg.	In bones, teeth, muscles and soft tissues. Needed for normal functioning of nerves and muscles.	Widely available in vegetables, grains, nuts, and seeds.	Deficiency is rare in healthy individuals, but can develop in alcoholics, diabetics, or prolonged taking of diuretics (water pills).
<b>Potassium</b>	Works with sodium to maintain the balance of fluids. Also important in transmitting nerve impulses.	Fruits (especially bananas and orange juice), vegetables, dairy products, fish, lean meats, poultry. Easily found in foods.	Diuretics, laxatives, and heart medications increase the need for potassium. As a prescribed medication, potassium is potent and must be carefully monitored.
<b>Sodium</b> (Chloride is also a required mineral we usually get along with sodium.)	Works with potassium to confront fluid balance. An electrolyte involved in many body maintenance functions.	The problem with sodium is getting too much. The typical diet supplies about ten times more than we need.	Some people with high blood pressure need to reduce sodium. Table salt is sodium chloride, about 40% sodium.

# Conversion Charts

<u>Mineral</u>	<u>Why We Need It</u>	<u>Food Sources</u>	<u>Comments</u>
<b>Iron</b>	Iron helps transport oxygen through the blood. Iron is also essential to proper muscle formation.	Meat and poultry, dried beans, some vegetables. Vitamin C is needed to help absorb the iron.	Too much iron is a problem. A well balanced diet supplies enough iron without supplements.
<b>Copper</b>	Needed to help iron work. Also assists in metabolism and enzyme formation. Colors hair and skin. Deadly poison in large amounts.	Any near normal diet supplies enough copper.	Large doses of Vitamin C (say 1500 mg daily), zinc supplements, and long term use of antacids interfere with the ability to absorb copper.
<b>Chromium</b>	Helps maintain blood sugar levels and regulates cholesterol.	Grains, peanuts, corn oil, some cheese, liver, clams.	Claims that chromium picolinate build muscle and melt fat are un-proven.
<b>Fluoride</b>	Present in micro amounts in all body tissue. Helps prevent dental cavities.	Many cities fluoridate drinking water.	Too much fluoride (rare) can mottle teeth and large doses can be toxic.
<b>Iodine</b>	Plays only one role — to become part of the thyroid hormone that controls metabolism.	Iodized table salt, saltwater fish, shellfish, and dairy products.	Deficiency can cause enlarged thyroid known as goiter in adults or cretinism in infants.
<b>Selenium</b>	Works with Vitamin E and is essential for good health.	Lean meats, eggs, sea-food, legumes, whole grains, Brazil nuts.	Deficiency very unlikely in North America. Supplements of 1 mg. or more a day) are toxic.
<b>Molybdenum</b>	Needed in tiny amounts as part of several enzymes.	Grains, vegetables, legumes, milk, liver, hard tap water.	Deficiencies unknown. Too much causes pain and gout-like swelling.
<b>Zinc</b>	Part of every living cell and involved in the activity of over 200 enzymes. It's involved in functions from taste to vision.	Oysters are the only food that is a good source of zinc. A varied diet provides enough zinc.	At risk for zinc deficiency are those who don't eat very much — the elderly, ill, or those on starvation diets.

# Minerals You Eat

## Quiz

1. Name two macrominerals.
2. Name two microminerals (trace elements) you need to survive.
3. Taking large doses of any mineral supplement (such as you might find on the shelves of your local "health food" store) could cause what problem?
4. Calcium is a mineral found in the ground. Yet we get most of our calcium from milk and dairy foods. How does the calcium get into milk?
5. True or false? Drinking milk is recommended for kids, but adults usually drink much less as they age. Because older women drink little milk, their bones become brittle and they develop osteoporosis or fall and break hips easily.
6. True or false? Spinach contains lots of calcium.
7. Complete this comparison: Carotene is to orange vegetables what is to red meat.
8. True or false. Iron deficiency anemia (a lack of iron) is very rare since iron is so easy to obtain from food.
9. Zinc is part of every living cell and is involved in body functions from taste to vision. Except for oysters, there is no single food that is an especially good source of zinc. How can you be sure you have enough zinc in your diet?
10. How do you know when it's time to restore your body's balance of electrolytes?

# Minerals You Eat

## Quiz Answer Key

1. Name two macrominerals.  
*Calcium, phosphorus, sulfur, potassium, magnesium, sodium, chloride.*
2. Name two microminerals (trace elements) you need to survive.  
*Iron, zinc, selenium, manganese, molybdenum, copper, iodine, chromium, fluorine. Others not mentioned in the video include nickel, and silicon. Boron, tin, and vanadium might also qualify.*
3. Taking large doses of any mineral supplement (such as you might find on the shelves of your local "health food" store) could cause what problem?  
*An imbalance of minerals. Minerals work only when in balance. Taking a supplement of one may create a new problem by "bumping" out supplies of another. For example, too much calcium interferes with the body's ability to absorb magnesium and zinc.*
4. Calcium is a mineral found in the ground. Yet we get most of our calcium from milk and dairy foods. How does the calcium get into milk?  
*Calcium gets into grass or other grains the cows eat from the soil it grows in. The calcium is preserved intact from soil to grain or grass, to cow, to our bodies.*
5. True or false? Drinking milk is recommended for kids, but adults usually drink much less as they age. Because older women drink little milk, their bones become brittle and they develop osteoporosis or fall and break hips easily.  
*False. Calcium deficiency is only one factor in osteoporosis. Other factors include estrogen, cigarette smoking and exercise. Drinking milk at age 65 will not restore weakened bones. Before age 21, calcium is stored in bones and teeth, but very little of the calcium consumed by older people is deposited in bones. But older people still need calcium.*
6. True or false? Spinach contains lots of calcium.  
*True, but the body can "use" very little of it —perhaps only 2%. Spinach does contain calcium but it is not a significant source in daily diets.*
7. Complete this comparison: Carotene is to orange vegetables what is to red meat.  
*Iron. Iron is a food colorant responsible for the red color in meat. Oxygen plays a role as well.*
8. True or false. Iron deficiency anemia (a lack of iron) is very rare since iron is so easy to obtain from food.  
*False. In underdeveloped countries, the lack of iron is a serious problem — it still affects perhaps a billion people. Even in countries with adequate nutrition, about 5% of women have a very mild iron deficiency.*
9. Zinc is part of every living cell and is involved in body functions from taste to vision. Except for oysters, there is no single food that is an especially good source of zinc. How can you be sure you have enough zinc in your diet?  
*Eat a wide variety of foods. Taking a zinc supplement is NOT the correct answer here.*
10. How do you know when it's time to restore your body's balance of electrolytes?  
*When you're thirsty. The "purpose" of thirst is to maintain your balance of fluids and minerals. Eating something salty makes you thirsty because extra water is needed to dilute the salt.*

# Pass That Woman More Calcium And Iron

Women's needs for certain nutrients exceed men's. Women of childbearing age need more iron. Calcium is another nutrient that may be more crucial to women.

A woman's need for iron is related to childbearing. In non-pregnant women, the monthly blood loss during menstruation may cause iron deficiency. A loss of 15 to 20 milligrams of iron occurs during an average menstrual period. However, about 10 percent of all women are believed to lose twice that much. This includes many wearing intrauterine devices. Women who use oral contraceptives may not have as much of an iron deficiency problem because blood loss is often reduced.

As iron is depleted, iron deficiency anemia can develop. The symptoms include pallor, fatigue and headaches. Clinically, iron deficiency anemia in non-pregnant women is defined as a hemoglobin count below 12. Depletion of iron reserves that has not reached the anemic stage is a less severe condition for many healthy pre-menopausal women. It is rare in healthy men. Even mild depletion of iron reserves (before anemia sets in) may be related to decrease physical and mental performance.

Before a woman takes iron supplements, her degree of deficiency should be diagnosed by a physician because some conditions with the same symptoms require less iron, and an excess of iron can cause serious problems.

There are two main types of dietary iron: heme and non-heme. Heme iron is found only in meat (including fish and poultry) and is more efficiently absorbed by the body. Non-heme iron comes from other iron-containing foods. Eating meat with non-heme iron foods improves the absorption of the non-heme iron by the body. Vitamin C also aids in iron absorption. To obtain the optimum amount of iron, eat foods rich in vitamin C and iron.

Iron absorption varies depending on need and certain diseases. People deficient in iron absorb a higher proportion, while those who have large stores of iron absorb less.

A woman needs about 18 milligrams of iron daily. Because people absorb only about 10 percent of the iron in food, the National Research Council recommends that women consume 18 milligrams of iron in their daily diets.

Some food components hinder iron absorption. For example, the tannic acid and phytates in tea interfere with iron absorption. Some fruits, vegetables and whole grains also contain phytates. Iron absorption is also diminished by antacids.

Calcium, found in milk and other dairy products, is also crucial to a woman's nutrition. The need for calcium is increased in pregnancy, and many experts say this need can best be met by building up calcium stores before pregnancy.

The same is true for osteoporosis, a condition in which bone mass decreases, causing bones to fracture easily. The increased need for calcium to prevent osteoporosis begins long before the onset of the condition.

Although osteoporosis occurs in both sexes with advancing age, it is far more common in women than men, in whites than blacks.

During the three to seven years following menopause, a woman's bone mass decreases rapidly. Because being underweight is an additional risk factor, the post-menopausal, underweight, white woman is at highest risk of osteoporosis. Overall, one out of four women develops osteoporosis by age 60 severe enough to lead to hip or other bone fractures.

Although use of estrogen and calcium supplements after menopause may help retard osteoporosis, young women may guard against its occurrence through exercise and by consuming foods high in calcium. Experts recommend that women increase consumption to 1,000 to 1,500 mg a day, although the current Recommended Dietary Allowance is 800 mg a day. However, exceeding 1,500 mg daily should be avoided because they could cause urinary tract stones in susceptible people.

Women who do not get enough calcium from dietary sources should consider calcium supplements. Before taking calcium supplements, women should consult their physicians. Tobacco, alcohol and caffeine may interfere with calcium absorption, but researchers have found that calcium absorption is improved in women who take oral contraceptives, probably due to the estrogen component of the pill. They have also found that combination birth control pills (containing both estrogen and progestin) seem to affect the absorption of several other nutrients.

In non-pregnant women, the monthly blood loss during menstruation may cause an iron deficiency. A loss of 15 to 20 milligrams of iron occurs during an average menstrual period. However, about 10% of all women are believed to lose twice that much. This includes many wearing uterine devices. Women who use oral contraceptives may not have as much of an iron deficiency problem because blood loss is often reduced with contraceptive use.