

## Trace Minerals

- Is extra zinc really necessary when you're under stress?
- Does everyone need iron supplements?
- Will selenium prevent cancer?
- How important is copper?

### What are trace minerals?

All these questions are about nutrients belonging to a group known as "trace minerals." They're called trace minerals partly because they are needed by the body in such very small amounts. Compare the small amounts listed in the table on the next page with the recommended dietary allowance (RDA) for calcium, which is 800 to 1,200 milligrams per day.

Trace minerals known to be needed by humans are listed in the following table along with current recommendations for adequate and safe levels of daily intake, and examples of important food sources. If you regularly eat a balanced diet made up of a variety of foods, there normally is no need to take extra amounts or special supplements to supply these nutrients.

Under certain conditions such as pregnancy, abnormally heavy menstrual flow, or recuperation after surgery, your physician or dietitian may make specific recommendations to meet special needs. Otherwise, be careful about supplements. As with many other substances, it's easy to go overboard and get too much of a good thing. However, if you do decide to take a supplement containing trace minerals, check the label and don't take more than about 150% of the RDA, since all trace minerals can be harmful when taken in large amounts. Too much of one can also interfere with how well your body uses others. Remember, with trace minerals, a little goes a long way!

TRACE MINERAL	RECOMMENDED DIETARY ALLOWANCE (RDA)*	IMPORTANT DIETARY SOURCES
Iron	10.0 - 18.0***	Whole grain products; enriched breads

		& cereals; meat (especially organ meats), poultry, fish; vegetables and legumes
Zinc	15.0	Meats (especially beef and organ meats), poultry, seafood (especially oysters)
Manganese	2.5 - 5.0	Whole grain products; nuts
Copper	2.0 - 3.0	Nuts; organ meats; legumes; whole grain products; fruits and vegetables
Flouride	1.5 - 4.0	Flouridated water; seafood; green leafy vegetables
Molybdenum	0.15 - 0.5	Meats; whole grain products; legumes
Iodine	0.15	Iodinized salt; seafood; dairy products
Chromium	0.05 - 0.2	Meats, meat products; cheeses; whole grain products
Selenium	0.02 - 0.2	Whole grain products; meats, poultry, fish

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\* For Adults

\*\* Those listed make especially notable contribution, but trace minerals are present in many other foods in small amounts. These can add up and make a significant contribution to the total daily dietary intake.

\*\*\* The RDA for men and for women after menopause is the same, 10 mg; for women during child-bearing years the RDA is 18 mg/day.

## Iron

Iron is especially important for the blood formation and function. Therefore, the need for iron increases when blood is lost on a regular basis, or during rapid growth. In both cases, more blood must be formed either to replace losses or to supply the needs of a larger body. Iron intake needs special attention:

- during infancy, not only because of the rapid growth taking place, but also because milk (which contains very little iron) makes up the main part of the diet;
- during the rapid growth of early childhood;
- during a woman's child-bearing years due to monthly blood losses;
- during and until three months after pregnancy.

Even at these times, a varied diet of ordinary foods can supply the body's needs because other factors increase iron absorption. For example, the more iron your body needs, the more iron it absorbs from the food you eat. Also, the form of iron in meat, poultry and fish is absorbed especially well by the body. In addition,

when you include some of these sources in your diet, they promote the absorption of iron from other foods such as breads, cereals, eggs, cheese, legumes and nuts. Foods high in Vitamin C can do this, too. Thus, combinations - like orange juice, toast and cereal for breakfast, a tuna salad sandwich with tomato juice and several strips of green pepper for lunch, and a serving of broccoli to accompany a cheese omelet or rice/lentil casserole dinner entree plus a section of melon or cantalope for dessert -- will help your body use the iron in your food to fullest advantage.

Doctors often recommend iron supplements for women during pregnancy, or prescribe them if a blood test shows a need for additional iron. But these are special situations involving a specific length of time. If you are taking an iron supplement (or any other supplement, for that matter) be sure to tell your doctor.

## **Zinc**

Zinc plays an important role in body growth, development and maturation; in tissue repair; and in resistance to disease. Low zinc intake has been linked to reduced growth (in children) and to delayed wound healing and reduced resistance to infection in adults, especially the elderly.

Does this mean that you can encourage growth, speed up tissue repair or increase resistance to disease and other stresses by taking more zinc, even if you consume enough zinc in your diet? No, it doesn't work that way. Although inadequate zinc intake increases the likelihood that problems will develop, and an adequate intake protects against these problems, extra amounts don't provide added protection. In fact, some research studies indicate that too much zinc can actually hamper the body's fight against disease. Excess zinc can also interfere with copper absorption; the two compete to be absorbed by the body, so too much of one can crowd out the other.

Poor zinc intake may occur among some groups in the U.S. population. For example, individuals on limited budgets and fixed incomes are more likely to have low zinc intakes because several good food sources of zinc, such as beef and seafood, are expensive. But this situation occurs among high- income groups, too. The reason? Poor food choices and diets that are too limited in the amounts and variety of foods eaten.

Food can supply you with zinc safely. Even though zinc may be less available from plant sources such as whole grain products, legumes and nuts, these foods can still make important contributions to total zinc intake. Supplemental zinc, if used at all, should be taken with caution. Such supplements should not exceed 150 percent of the RDA, and should probably include copper.

## **Copper**

Copper contributes to several important bodily functions. It helps the body use iron effectively in forming blood; it plays a prominent role in cartilage and bone development; and it is one of several nutrients that enable body cells to use the energy present in carbohydrate, protein and fat.

Severe copper deficiency is very rare. In most cases it is due to a genetic disease. Even mild copper deficiency is uncommon because of the small amounts needed by the body and because copper is present in so many foods. The risk of mild deficiency may increase if the diet is very limited and if zinc supplements are overused.

Copper is still being studied actively by scientists. You may hear reports of breakthroughs in knowledge about copper. Be careful about accepting isolated reports as fact; wait to find out if what you hear or see in the media is reliable information or just somebody's hunch about a chance observation. (This applies to other nutrition information as well.)

## **Selenium**

Selenium is another trace element receiving a great deal of attention in the press. This is because technology has advanced to the point where research on selenium is possible. Before now, it was difficult to measure the small amounts of selenium involved in body functions. For example, selenium intake in the amounts considered normal and healthy for copper (2 mg to 3 mg) would probably cause severe poisoning. On the other hand, in very small amounts, selenium--along with vitamin E--helps protect body cell membranes from deterioration. This means that many different tissues can be affected by too little (or too much) selenium.

Researchers are looking especially hard at whether selenium might protect against cancer, as some studies with animals suggest. But studies which can be applied to humans are very limited and not at all clear-cut. At present it seems safe to say that adequate intake may be beneficial, but that larger amounts are not necessarily protective. Added to the danger of toxicity from large amounts of selenium is the concern that some selenium compounds may be cancer-causing rather than cancer-preventing. Clearly, we need more precise information about human requirements for selenium and about its relationship to cancer. Currently, most health authorities are very cautious about suggesting both satisfactory and safe levels of selenium supplements.

Can you depend on diet to supply the recommended levels of selenium? In this day and age, it is easy to answer yes to that question. The selenium in plant foods depends on the soil in which they grew, and in animal products, on where their food was grown. Some areas of the United States and other countries have high levels of selenium in the soil, and some areas have low levels. Food products available in our supermarkets come from many different growing areas.

As a result, variations in the selenium content of foods from different places "average out" in the diet.

There is little cause for concern except for the unusual case of someone who eats **exclusively** locally grown foods year-round, a highly unlikely situation. Analyses of diets in different areas of the United States show the typical selenium content is within the recommended range---another good illustration of how important it is to emphasize a wide variety of food choices in your meals.

## **What about other trace minerals?**

Needs for the other five trace elements listed in the table are also likely to be met by eating a reasonably varied diet in amounts that meet energy needs. They serve many different functions in the body. Iodine is needed to make thyroid hormone; chromium and manganese help the body use carbohydrate efficiently for energy; manganese helps in the formation of bone and cartilage; fluoride protects against tooth decay; and molybdenum helps the body use other necessary compounds or handle their waste-products.

Some additional trace elements are being studied as possible requirements for humans. New findings about them as well as about those listed above continue to be revealed. Many questions remain to be answered. For more information, or referral to qualified authorities, contact your Cooperative Extension county home economist.

## **Remember These Important Points**

- Diets consisting of a variety of choices from each of the four basic food groups can supply all the minerals you need and in adequate amounts.
- All trace minerals can be harmful in large amounts.
- If someone recommends that you take special supplements, be sure that person is a qualified health professional with training in nutrition.
- For further information and help with such questions, contact your Cooperative Extension county home economist.