



# Drug - Nutrient Interactions

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## How Drugs and Nutrients Interact

Both prescription and over-the-counter medications can affect the way your body uses nutrients in food. In addition, certain foods or nutrients in food can affect the action of medications.

A drug-nutrient interaction is the effect of a medication on food or a nutrient in food. Medications interact with foods and nutrients in several ways. Medications can decrease appetite or change the way a nutrient is absorbed, metabolized, or excreted.

A food-drug interaction is the effect of food or a nutrient in food on a medication. Dietary nutrients can affect medications by altering their absorption or metabolism. The food you eat could make the medications you take work faster, slower, or even prevent them from working at all.

Such interactions raise concerns that medications may lead to nutritional deficiencies or that your diet may change how a medication works. This does not mean that if you are taking a medication you need to use a vitamin and or mineral supplement. There is little chance that taking a medication for a short time, such as a ten-day treatment, will affect your nutritional status. However, use of some medications for months or years may affect your nutritional health.

Children, older adults, pregnant women, people who are poorly nourished, and people with a chronic disease are at greater risk of medications affecting their nutritional health. Changing the diet to include more foods rich in vitamins and minerals is preferred to taking vitamin or mineral supplements. In fact, vitamin and/or mineral supplements taken in excess can affect how a medication works.

## Drug-Nutrient Interactions

Medications, both prescription and over-the-counter, can affect how the body uses nutrients. For individuals taking medications for long periods of time drug-nutrient interactions may lead to vitamin or mineral deficiencies.

- Medications can decrease appetite or cause nausea, vomiting, an unpleasant taste, or dry mouth. This can affect nutritional health by causing poor food intake.

Example: Appetite suppressants are medications that directly affect food intake by depressing appetite.

Example: Several cancer medications and treatments may cause nausea, vomiting, sore, or dry mouth resulting in poor food intake.

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- Medications can decrease nutrient absorption.

Example: Laxatives can decrease the absorption of many vitamins and minerals. Laxatives cause food to move rapidly through the body causing poor nutrient absorption.

Example: Aluminum hydroxide contained in some antacids can bind to phosphorus in food. This can prevent phosphorus from being absorbed and used by the bones. Over time this could result in phosphorus depletion. Mild phosphorus depletion causes muscle weakness and severe cases can cause osteomalacia and severe pain in walking.

Example: Some anticonvulsants can decrease folate absorption. Folate deficiency can result in megaloblastic anemia.

Example: Some cholesterol lowering medications reduce cholesterol by removing bile acids. Bile acids are needed to absorb the fat-soluble vitamins A, D, E, and K. As a result some cholesterol lowering medications can reduce absorption of fat-soluble vitamins.

- Medications can slow down nutrient production.

Example: Vitamin K is produced by bacteria in the intestines. Antibiotics kill harmful bacteria, but they can also kill helpful bacteria. Killing the helpful vitamin K producing bacteria decreases the amount of vitamin K produced in the intestine.

- Medications can interfere with the body's ability to metabolize nutrients.

Example: Birth control pills can lower levels of vitamin B<sub>6</sub> and folate in the body.

- Medications can increase the loss of a nutrient.

Example: Diuretics remove excess fluid from the body. Some diuretics may also increase loss of potassium along with fluids. Potassium is very important in proper functioning of the heart and other muscles.

Example: Large amounts of aspirin can cause increased loss of folate. Also, large amounts of aspirin over long periods of time may cause stomach bleeding that could result in iron deficiency. Over time iron deficiency can lead to anemia.

Example: Some anticonvulsant medications can cause the liver to increase the removal of vitamin D from the body. Vitamin D is needed for calcium absorption.

## Food-Drug Interactions

Food and nutrients can also alter a medication's effectiveness in many ways.

- Food can increase or decrease the absorption of a drug. Absorbing less than the intended dose may decrease the effect of the drug. Absorbing more than the intended dose increases the chance for an overdose effect.

Example: Dietary calcium can bind to the antibiotic tetracycline. As a result the body does not absorb the amount of antibiotic intended.

Example: Drugs are absorbed more quickly into the body when the stomach is empty. Having food in the stomach will slow down a medication's absorption. Sometimes a medication should be taken with food. Other medications should be taken on an empty stomach, one hour before or two hours after eating. It is important to read the directions to see if a medication should be taken with or without food.

Example: The type of food or beverage consumed with a medication can affect a medication's absorption. Usually, medications should be taken with water. Acidic soft drinks, juices, and foods may produce excess stomach acidity which may destroy a medication or cause a medication to dissolve in the stomach instead of the intestine. Acidic foods may dissolve a timed release medication all at once instead of over time.

- Foods or nutrients may interfere with a drug's metabolism or a drug's action in the body.

Example: Aged and fermented foods contain a chemical called tyramine that interacts with a medication, monoamine oxidase inhibitor. This interaction can result in dangerously high blood pressure.

Example: Vitamin K can decrease the effectiveness of certain anticoagulant medications.

- Foods or nutrients may be needed for the removal of a medication from the body.

Example: Liver enzymes prepare medications for removal from the body. These enzymes require nutrients to work properly. If required nutrients are not present, medications may stay active in the body longer than they are supposed to. This may cause an overdose effect.

## Alcohol

Alcohol and medications do not mix well. Alcohol can adversely affect medications as well as nutrients. Alcohol can slow down the body's metabolism. As a result medications can stay active in the body longer than they were supposed to. In some cases, mixing alcohol and medications can be fatal. A rule of thumb is to avoid alcoholic beverages when taking prescription or over-the-counter medications.

## Nutrient Supplements

Nutrient supplements themselves can result in drug-nutrient interactions. In excessive amounts, vitamins and minerals act like drugs instead of nutrients. Nutrients in excessive amounts may interact with other nutrients or may even be toxic.

Large amounts of zinc can interfere with copper and iron absorption. Similarly, large amounts of iron can interfere with zinc absorption.

## The Importance of Following Directions

It is important to follow the directions on how to take a medication. Many people do not take prescription or over-the-counter medications properly. Following the directions on how to take a medication can affect how or if a medication works.

## Who is at Risk of Drug-Nutrient Interactions?

Some people may be at greater risk of drug-nutrient interactions than others. Those considered at higher risk for drug-nutrient interactions include:

- Persons who have a poor diet.
- Persons who have serious health problems.
- Growing children.
- Pregnant women.
- Older adults.

- Persons taking two or more medications at the same time.
- Persons using prescription and over-the-counter medications together.
- Persons not following medication directions.
- Persons taking medications for a long periods of time.
- Persons who drink alcohol or smoke excessively.

## How to Lower the Risk of Drug-Nutrient Interactions

- Eat a healthy diet following the recommended servings from the USDA Daily Food Plan.
- Follow directions on how to take medication (prescription and over-the-counter).
- Read warning labels on both prescription and over-the-counter medications.
- Do not share medications with others or take other peoples' medications.
- Do not take over-the-counter medications frequently on your own.
- Tell your physician about everything you are taking, including over-the-counter medications, alcohol, and herbal products.
- Tell your physician and pharmacist about any new or intensified symptoms that develop when taking a medication.

- Keep a list of all medications (prescription and over-the-counter) that you use.
- If you have questions, ask your pharmacist, physician, or dietitian for answers.

## Questions to Ask Your Physician When You Get a Prescription

- What is the medication for? (medication name, medication purpose).
- How should I take the medication? (dosing schedule, how long, storage recommendations, recommendations on consuming food and/or beverages with the medication).
- What should I expect? (expected outcomes, precautions, side effects).

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Extension carries out programs in the broad categories of agriculture, natural resources and environment; family and consumer sciences; 4-H and other youth; and community resource development. Extension staff members live and work among the people they serve to help stimulate and educate Americans to plan ahead and cope with their problems.

Some characteristics of the Cooperative Extension system are:

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- It is administered by the land-grant university as designated by the state legislature through an Extension director.
- Extension programs are nonpolitical, objective, and research-based information.
- It provides practical, problem-oriented education for people of all ages. It is designated to take the knowledge of the university to those persons who do not or cannot participate in the formal classroom instruction of the university.
- It utilizes research from university, government, and other sources to help people make their own decisions.
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- It dispenses no funds to the public.
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Issued in furtherance of Cooperative Extension work, acts of May 8 and June 30, 1914, in cooperation with the U.S. Department of Agriculture, Robert E. Whitson, Director of Cooperative Extension Service, Oklahoma State University, Stillwater, Oklahoma. This publication is printed and issued by Oklahoma State University as authorized by the Dean of the Division of Agricultural Sciences and Natural Resources and has been prepared and distributed at a cost of 20 cents per copy. Revised 0811 GH.