service in ACTION

Colorado State University Cooperative Extension

no. 9.361

Nutrient-drug interactions and the food you eat

Jennifer Anderson[1]

Quick Facts

- Medications need to be taken at different times, in relation to meals.
- Drugs and medications can interact with nutrients in food.
- Generic drugs often are substituted for brand-name counterparts and usually are less expensive.
- Over-the-counter drugs are those that the FDA has approved for self-medication. Consult a physician when health problems persist.
- During pregnancy and nursing always consult a physician or pharmacist before taking any medication. Drugs taken by the mother may affect the infant.
- Take all medications only with water, unless otherwise advised.
- **Please check with a doctor or pharmacist for the proper way and time to take medication.**

It is a difficult and complex problem to accurately determine the effects of food and nutrients on a particular drug. There are many dramatic results or problems caused by food-drug, drug-drug and alcohol-food-drug interactions. The following table is designed to help the reader become more knowledgeable about drug interactions and their effect on food, a nutrient or another drug that may produce unexpected results or cause additional health problems.

Generic Drugs

Generic drugs can, and often are, substituted for brand-name counterparts. Generic drugs usually are more economical than brand-name drugs. Possible exceptions might be enteric-coated aspirin. It commonly is thought that generic

drugs only differ from brand-name counterparts in color, taste, tablet shape and packaging. There still are questions whether both are equivalent in concentration of active ingredients, strength, release rate and effect on the body.

Over-the-Counter (OTC) Drugs

Points to Remember:

1) OTC drugs usually are meant only to relieve symptoms, not **cure** a disease or illness.
2) Improper use can make symptoms worse or conceal a serious condition that needs to be brought to a doctor's attention. Never take OTC drugs longer than recommended on the label. If symptoms persist or if new symptoms occur, see a doctor.
3) Read the label carefully before taking an OTC product and every time an OTC product is bought. There may be important changes in indications, warnings or directions.
4) People with allergies or chronic health problems should be especially careful to read the ingredient, warning and caution statements carefully. If there are any questions, consult a doctor or pharmacist.

---

[1]*Jennifer Anderson, Ph.D., R.D., Colorado State University Cooperative Extension foods and nutrition specialist and assistant professor.* *Appreciation is extended to V. Bailey, R. Ph., B. Smith, Ph.D. and Nancy Arthur-Coffman, M.S., R.D. for their review and recommendations (Revised 12/89)*

Issued in furtherance of Cooperative Extension work, Acts of May 8 and June 30, 1914, in cooperation with the U.S. Department of Agriculture, Kenneth R. Bolen, director of Cooperative Extension, Colorado State University, Fort Collins, Colorado. Cooperative Extension programs are available to all without discrimination. To simplify technical terminology, trade names of products and equipment occasionally will be used. No endorsement of products named is intended nor is criticism implied of products not mentioned.

5) Remember to check expiration dates from time to time. Destroy in the safest way possible any drugs that are outdated or those that have deteriorated—examples, discolored eyedrops or ointment, vinegar-smelling aspirin.
6) Keep all drugs and medications out of the reach of children.
7) When pregnant or nursing a baby, check with a health professional before taking any drugs.

Aspirin vs. Acetaminophen vs. Ibuprofen

Aspirin, acetaminophen and ibuprofen all have analgesic and antipyretic properties. Only aspirin and ibuprofen also contain anti-inflammatory properties. Acetaminophen does not produce the stomach/intestinal irritation or allergic reactions that aspirin can. Gastrointestinal side effects observed with aspirin are greatly reduced with ibuprofen, although patients with aspirin hypersensitivity can have similar reactions.

References

Facts and Comparisons Drug Information. J. B. Lippincott, 1987.

Hansten, P. D., *Drug Interactions*, fifth edition, Lea & Febiger, 1985.

Lewis, K. T., Here's a brief overview of important drug-nutrient interactions. Pharmacy Times, May, 1987.

Hecht, Annabel. "OTC Drug Labels: Must Reading," *FDA Consumer*, October 1985, pp. 33-35.

Rados, Bill. "Generic Drugs: Cutting Cost, Not Corners," *FDA Consumer*, October 1985, pp. 27-29.

Handbook: Interactions of Selected Drugs With Nutritional Status, Daphne Roe, American Dietetic Association, 3rd Edition, 1984.

Food and Drug Interaction Guide, L. H. Rottmann, NebGuide (HEG85-206), 1985.

"Drug-Nutrient Interactions," Daphne Roe, Hoffmann-La Roche, Inc.

Joe Graddon, The People's Pharmacy 2. New York: The Hearst Corporation, 1980.

Effects of Food and Nutrients on Drugs

If You Take:	Be Careful With:	Because:
Analgesic and antiinflammatory agents: Aspirin, Ibuprofen, Indomethacin, Acetaminophen	Co-administration with food.	Absorption rate may be delayed or reduced due to decreased stomach emptying rate.
Antibiotics: Penicillin	Acidic foods: caffeine drinks, tomatoes, fruit juice.	Increased stomach acid may increase destruction of this drug in the stomach.
Erythromycin	Same as penicillin.	
Tetracycline	Foods rich in calcium: milk, cheeses, ice cream, yogurt. Don't avoid milk products, but take at a different time.	Empty stomach for better absorption. Calcium, iron preparations and some antacids decrease absorption of the drug or render it ineffective, probably due to chelation and an increase in gastric pH.
Anticoagulants: (Blood Thinners) Dicumarol Coumadin®	Green leafy vegetables, beef liver, broccoli, asparagus, mineral oil, tomato, coffee.	These foods contain vitamin K (promotes blood clotting), which interfere with the effect of the blood thinner. Mineral oil decreases the absorption of vitamin K and may increase the effect of the anticoagulant.
Antidepressants: (MAO-monoamine oxidase inhibitors	Tyramine-rich foods: aged cheese, avocados, wine, sour cream, chicken livers, yeast products, pickled herring. Excessive caffeine: chocolate, tea, coffee.	Tyramine may cause potentially lethal increases in blood pressure, fever, terrible headache, vomiting, possibly death.
Antihypertensives: (Drugs for high blood pressure)	Natural licorice. Foods with excessive sodium: cured meats, pickled vegetables, canned soups, processed foods—especially cheese, salted snacks, added salt at table.	Natural licorice contains a substance that causes excessive water retention and thereby increased blood pressure.
Bronchodilators: Theophylline	Charcoal-broiled foods and high carbohydrate diet. Don't eat large amounts of high protein foods: meat, milk, eggs, cheese.	Too much charcoal and carbohydrates decreases absorption of this drug. Protein increases the metabolism of the drug.
Corticosteroids: Prednisone, Solu-medrol® Hydrocortisone	Foods high in sodium: cured meats, pickled vegetables, canned soups, processed foods—especially cheese, salted snacks, added salt at table.	This class of drugs causes increased sodium and water retention leading to edema.
Diuretics: Potassium Wasting: Modiuretic®, Naqua®, Lasix®, Oretic®	Natural licorice.	See antihypertensives. Diuretics may cause excessive losses of potassium and severe electrolyte disturbances: also loss of vitamin B complex, magnesium, calcium.

Effects of Food and Nutrients on Drugs. Continued.

If You Take:	Be Careful With	Because:
Laxatives: Dulcolax	Milk.	Laxative becomes ineffective and causes stomach irritation.
Iron supplements:	Milk, acidic foods.	Milk binds iron making it unavailable. Acidic foods increase absorption causing nausea.
Potassium Sparing: Dyrenium® Aldactone®	Potassium-rich foods: bananas, figs, wheat germ, orange juice (2 or 3 glasses), salt substitutes, Monosodium glutamate (MSG), sodium-rich foods.	May cause excessive retention of potassium and cardiac problems. Salt substitutes may contain potassium rather than sodium.
Theophylline: Theolair® Somophylline	Co-administration with food.	Decreased absorption rate.
Levodopa (L-Dopa) (for Parkinson's disease)	High protein foods: milk, meat, eggs, cheese. Foods rich in vitamin B_6: beef/pork liver, wheat germ, yeast products.	An increase in protein decreases the absorption of this drug. B_6 antagonizes the drug.

Effects of Drugs on Food or Nutrients

If You Take:	You May Require Extra	Because:
Alcohol, particularly excessive use.	B complex vitamins including folic acid. Magnesium.	Turnover of these nutrients increases, and food intake decreases.
Analgesics: Salicylates (aspirin)	Iron, vitamin C, folic acid, vitamin K.	Aspirin increases loss of iron and vitamin C and competes with folic acid and vitamin K.
Antacids	Thiamin (Vitamin B_1), folic acid.	Alkaline pH in the stomach increases breakdown of these vitamins.
	Magnesium, phosphorus, iron.	These drugs cause decreased absorption of these nutrients.
Antibiotics	Nutrients.	Appetite suppression and diarrhea are caused by some of these agents.
Anticancer drugs.	Nutrients.	See Antibiotics.
Anticholinergics: Elavil, Thorazine	Fluids.	Saliva thickens and loses its ability to prevent tooth decay.
Anticonvulsants	Folic acid, vitamin D.	These drugs cause decreased absorption of folic acid possibly leading to megaloblastic anemia. Increases turnover of vitamin D, especially in children.
Antidepressants: Lithium carbonate, Lithane®, Lithobid®, Lithonate®, Lithotabs®, Eskalith®	Water (2-3 qts./day) and take with food.	This medication may cause a metallic taste, nausea, vomiting, dry mouth, loss of appetite, weight gain and increased thirst.
Sedatives Barbiturates	Folic acid, vitamin D, vitamin B_{12}, thiamin, vitamin C.	Drugs increase the rate these vitamins are used by the body.
Anti-inflammatory agents.	Iron.	These medications can cause G.I. blood loss.
Cholesterol-lowering medications: Questran®	Fat-soluble vitamins: A, D, E, K, folic acid.	May cause decreased absorption of these vitamins.
Corticosteroids: Prednisone, Solu-Medrol®, Hydrocortisone	Protein, potassium, calcium, zinc.	These drugs cause an increase in excretion.
Diuretics: Potassium wasting; Naqua®, Lasix®, Oretic®	Potassium, calcium, magnesium, zinc.	These drugs cause the body to lose potassium.
Iron supplements	Vitamin E.	Iron reduces absorption of vitamin E.
Mineral oil	Fat-soluble vitamins: A, D, E and K.	Oil decreases absorption.
Oral contraceptives	Vitamin B_6 and folic acid.	They may cause selective malabsorption or increased metabolism and turnover.
Antacids	Tagamet®, Indomethacin, Naprosyn®.	Antacids inhibit or delay the absorption of these medications.
Anticholinergics: Elavil®, Thorazine®	Levodopa, potassium supplements.	Anticholinergics decrease absorption of levodopa. They also decrease gastric motility, allowing potassium to cause gastric lesions.

Effects of Drugs on Drugs

If You Take:	Be Careful With	Because:
Anticonvulsant medication:	Anticoagulants	Many produce toxic levels of Dilantin® and cause hemorrhaging by raising the anti-coagulant level.
Dilantin®	Digitalis heart medications.	After prolonged anticonvulsant therapy, effectiveness of digitalis medication may decrease.
	Sulfa antibiotics.	May prevent normal elimination of epilepsy drugs.
	Antabuse.	If taken on top of Dilantin, each drug may independently produce serious side effects. Nervous system toxicity and blood ailments are possibilities.
Antidepressants:		
Tricyclics: Sinequan®	Alcohol, barbituates, Tagamet®	Sedation and drop in body temperature may occur. Decreased absorption. Antidepressant toxicity can occur.
Adapin®, Elavil®	Blood thinners	Increased anticoagulant effect.
Lithium®	Diuretics	Increases effect of Lithium®.
Norpramin®	Anticonvulsants	Antidepressants can increase susceptibility to seizures.
	MAO inhibitors (used for depression or high blood pressure).	May cause excitation, delirium, rapid pulse, elevated body temperature and convulsions.
	Minor tranquilizers: Benzodiazepines.	Severe sedation may make concentrating difficult and driving dangerous.
Antidiabetic agents (oral and insulin)	Calcium channel blockers: Isoptin®, Calan®	These medications alter carbohydrate metabolism.
	Oral contraceptives.	Impair glucose tolerance.
	MAO Inhibitors, Tetracycline.	Hypoglycemia can occur.
Antihistamines	Alcohol.	Sedation can occur.
Arthritis medication (Potent antiinflammatory agents)	Blood thinners.	Increases susceptibility to internal hemorrhaging.
	Aspirin and aspirin-containing pain relievers.	May result in ulcers. Aspirin can diminish the effectiveness of the more powerful drug.
	Birth control pills.	Could decrease effectiveness.
Aspirin	Diabetes medicine (oral)	May cause excessive lowering of blood sugar.
	Drugs for gout.	Aspirin can block the beneficial effects. Never combine them.
	Vitamin C.	Large doses of vitamin C can prolong and possibly intensify the action of aspirin. Could produce salicylate side effects (headaches or dizziness) in sensitive people.
Barbiturates	Alcohol.	Increased central nervous system depression.
Benzodiazepine; Valium®, Librium® Tranxene®, Xanax®	Tagamet®	Increased sedation can occur.
Blood thinners; Coumadin®, Dicumarol	Analgesic pain relievers: aspirin products and arthritis medication.	These enhance blood thinning response, irritate stomach, and may lead to ulcer and hemorrhage.
	Alcohol.	Can increase or decrease blood thinning effects.
	Antibiotics.	Decrease vitamin K production increasing chance of hemorrhage.
	Cholesterol lowering medications: Atromid-S	Augments blood thinning response to serious hemorrhage.
	Thyroid gland supplements.	When combined with anti-coagulant medication, patient is vulnerable to hemorrhage unless dosage is decreased.
	Questran®, laxatives, mineral oil.	These drugs decrease absorption.
Calcium channel blockers	Calcium supplements.	Decreased response to blockers.
Corticosteroids: Prednisone® Solu-medrol®	Cholesterol-lowering medications.	Inhibits absorption.
Digitalis:	Antacids.	Decreased absorption.
Lanoxin	Cholesterol-lowering medications.	Decreased length of effect.
	Valium®.	Increased effect.
	Diuretics.	Digitalis toxicity due to potassium loss.
Oral contraceptives	Valium®.	Oral contraceptives enhance effect of Valium®.
Tetracycline	Antacids.	Cuts down on effectiveness of Tetracycline.
	Zinc, iron supplements.	Same as antacids.