

Phosphorus and Diet

Limit your phosphorus intake to 800-1000 mg per day.

What is phosphorus?

Phosphorus is a mineral found in many foods. Phosphorus combines with calcium to help build bones and teeth. Usually, more phosphorus is absorbed into the blood than is needed by the body. Healthy kidneys can remove extra phosphorus from the blood. If kidney function is limited, too much phosphorus can build up in the blood.

What is a safe blood level of phosphorus?

Medical professionals at UC Davis Health consider a phosphorus level of 2.4 – 5.0 mg/dL to be normal. Normal ranges may vary from one institution to another. Ask your doctor or dietitian about your phosphorus level. The symptoms of high phosphorus in the blood may include muscle aches and cramps, itching, and calcium deposits (lumps under the skin).

Why does phosphorus need to be restricted?

When there is too much phosphorus in the blood, calcium is pulled out of the bones. Over time this may result in weak bones or “renal bone disease.” Limiting phosphorus in your diet helps keep the phosphorus in the blood at a normal level. The food lists that follow can help you choose the right foods.

What can be done to avoid build-up of phosphorus in the blood when kidney function is limited?

Phosphorus is controlled by limiting intake of high-phosphorus foods and taking phosphorus binding medications (phosphorus binders). Phosphorus binders work like sponges and magnets in the stomach; they either absorb or connect with phosphorus so that phosphorus is not absorbed into the blood, but rather emptied from the body in stool.



When should phosphorus binders be taken?

Phosphorus binders need to be taken when food is eaten. It is important to take phosphorus binders with each meal. The amount of binders required depends on your blood level of phosphorus, your need for calcium supplementation, and your dietary intake of phosphorus. Phosphorus binders will be prescribed by your doctor.

For more information, the following websites may be helpful:

- American Association of Kidney Patients: www.aakp.org
- Culinary Kidney Cooks: www.culinarykidneycooks.com
- DaVita: www.davita.com
- Kidney School: www.kidneyschool.org
- National Kidney and Urologic Diseases Information Clearinghouse: <http://kidney.niddk.nih.gov>
- National Kidney Foundation: www.kidney.org
- The Nephron Information Center: <http://nephron.com>
- The Renal Gourmet: www.kidney-cookbook.com
- USDA Nutrient Database: www.nal.usda.gov/fnic/foodcomp/search/

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Food Group	Higher Phosphorus		Lower Phosphorus	
Dairy and Dairy Substitutes	Cheese (1 oz)	145 mg	Almond milk (8 oz)	20-30 mg
	Cottage cheese (½ c)	150 mg	Mocha Mix® (1 Tbsp)	24 mg
	Cream soups (1 c)	274 mg	Nondairy creamer (4 oz)	50-57 mg
	Custard (½ c)	159 mg	Rice milk, unfortified (4 oz)	67 mg
	Eggnog (1 c)	276 mg	Whipped cream (2 Tbsp)	0 mg
	Ice cream (1 c)	160 mg		
	Milk (8 oz)	230 mg		
	Milkshake (12 oz)	410 mg		
	Pudding (½ c)	150 mg		
	Soymilk (8 oz)	125 mg		
	Yogurt (8 oz)	270 mg		
Grains	Biscuits (1 medium)*	219 mg	Corn flakes (1 c)	12 mg
	Bran cereal (½ c)	140-260 mg	Cream of rice (1 c)	41 mg
	Brown rice (1 c)	150 mg	Cream of wheat (1 c)	66 mg
	Cornbread (2" x 2")*	110 mg	Grits (1 c)	51 mg
	Oatmeal (½ c)	130 mg	Rice cereal (1 c) : Rice	35 mg
	Pancake, 6" across (1)*	241 mg	Krispies®, puffed rice, Rice	
	Quinoa (1 c)	280 mg	Chex®	
	Shredded wheat (1 c)	288 mg	Pasta, noodles (1 c)	81 mg
	Waffle, 4" square (1)*	151 mg	White bread (1 c)	30 mg
	Wheat germ (1 oz)	325 mg	White rice (1 c)	68 mg
	Wheat pasta (1 c)	125 mg	Wheat bread (1 c)	39 mg
	Wild rice (1 c)	135 mg		
		*Be careful with boxed, processed grain mixes which often have phosphorus preservatives. Ask your dietitian about eating whole grains instead. Whole grains like brown rice, wheat bread and wheat pasta have more fiber, and the phosphorus they contain may be safer to eat.		
Fruits and Vegetables	Artichokes (1 medium)	88 mg	<i>All fruits and vegetables not listed under "higher phosphorus" have less than 25 mg per ½ cup serving, such as:</i>	
	Broccoli (1 c chopped)	60 mg	Apple	Lettuce
	Brussels sprouts (1 c)	87 mg	Asparagus	Melon
	Corn (½ c)	50 mg	Banana	Tomato
	Corn-on-the-cob (1 ear)	79 mg	Berries	Pineapple
	Prunes (½ c)	60 mg	Carrot	Strawberries
	Peas (½ c)	60 mg	Grapes	Zucchini
	Potato (1 medium)	120 mg		
	Soy beans (½ c)	142 mg		

Food Group	Higher Phosphorus	Lower Phosphorus		
Other Foods	Chocolate (1.5 oz)	125 mg	Caramel (2 Tbsp)	19 mg
	Mac & cheese (½ c)	128 mg	Cream cheese (1 Tbsp)	15 mg
	Pizza, cheese (1 slice)	239 mg	Cream soups, made with water (1 c)	37 mg
			Gelatin (½ c)	30 mg
			Popsicle, fruit ice (1 bar)	1 mg
			Pudding (½c)	0-20 mg
			Sherbet (½ c)	30 mg
	Be careful with processed foods as they can be a significant and hidden source of phosphorus. Always check the ingredient list for ingredients that include “phos”.			
Beverages	Beer (12 oz)	50 mg	Apple juice (8 oz)	17 mg
	Canned ice tea (12 oz)	114 mg	Coffee (8 oz)	7 mg
	Cocoa, prepared with water (6 oz)	90 mg	Cranberry juice (8 oz)	33 mg
	Cola, including Dr. Pepper® (12 oz)	26-60 mg	Ginger ale (12 oz)	0 mg
	Shakes made with fruit and sherbet (8 oz)	40-60 mg	Grape juice (8 oz)	35 mg
			Lemonade (8 oz)	5 mg
			Lemon-lime soda (12 oz)	0 mg
			Mineral water (8 oz)	0 mg
			Orange juice (8 oz)	42 mg
			Pineapple juice (8 oz)	20 mg
			Root beer (12 oz)	0 mg
			Tea, brewed (8 oz)	2 mg
			Sugar-free flavored water (8 oz)	0 mg
	Even beverages that contain lower amounts of phosphorus may be restricted in your diet plan because this form of phosphorus may be more easily absorbed into your bloodstream.			

Most protein foods are high in phosphorus but it is important that you meet your protein goal. Talk with your dietitian about how much protein you should be eating at each meal. Be careful with processed or “enhanced” meats as they can be a significant and hidden source of phosphorus. Always check the ingredient list for ingredients that include “phos”.

Protein Foods – Phosphorus Content			
Beef (3 oz)	174 mg	Nut butters (2 Tbsp)	115 mg
Dried beans (½ c)	94-140 mg	Organ meats (3 oz)	487 mg
Egg yolk (1)	66 mg	Pork (3 oz)	290 mg
Egg white or substitute (¼ c)	5 mg	Poultry (3 oz)	196 mg
Fish (3 oz)	117 mg	Shrimp (3 oz)	260 mg
Lamb (3 oz)	189 mg	Sunflower seeds (1 oz)	222 mg
Lentils (½ c)	178 mg	Tofu (½ c)	105-239 mg
Nuts (1 oz)	133-200 mg	Turkey (3 oz)	210 mg