Feature Editor: Sharon Stall, MPH, RD, CSR, CDN

Can Pizza Fit in to the Renal Diet? A Review of the Phosphorus, Potassium, and Sodium Content of Selected Frozen and Delivery Options

Jacqueline R. Abels, MA, RD, CSR, LD

PIZZA IS ONE of the most widely consumed foods in the United States.[1] According to "What We Eat in America," the dietary interview component of the NHANES 2007 to 2010, approximately 13% of Americans are eating pizza on any given day.[2] In addition, pizza can account for as much as 25% of the day's energy requirements and is a top contributor to sodium in the typical American diet.[2] Pizza sales at chain restaurants are growing, but according to industry reports, frozen pizza sales are also up in the United States.[1] With these foods trending among the general population, should we as renal dietitians expect that our patients will indulge?

Although most renal dietitians do not encourage their patients to eat pizza, it is probably realistic to assume that at some point pizza will find its way to the tables of our patients. The wide variety of ingredients found in pizza, including the crust and toppings, can be a significant source of phosphorus, potassium, and sodium in the diets of renal patients. Cheese, tomato-based sauces, and vegetable toppings may contribute to life-threatening hyperkalemia. Cheese and preservatives in meat toppings and dough additives may contribute to high serum phosphorus levels. Elevated serum phosphorus in renal patients may cause long-term renal bone disease and coronary artery calcification.[3] In addition, the high sodium content of many pizza ingredients may contribute to increased thirst and interdialytic fluid gains in dialysis patients as well as dangerous increases in blood pressure.[3]

The role of the renal dietitian is to educate patients regarding the safest and healthiest food options for their medical condition, in other words, recommending the "best" options for their patients. Often the dietitian will recommend a "fresh food" approach or focus on homemade options which may or may not be realistic for many renal patients. Sometimes, however, the dietitian must recommend the "not as bad" option, especially with pizza, to continue to provide realistic counseling for patients navigating the real world of family reunions, date nights, grandkids' birthday parties, and late night pizza cravings.

Many more motivated patients will read food package labels before purchasing or eating an item, but often these food labels are incomplete and do not include phosphorus or potassium content. Some patients may even determine if there is nutrient information available online before heading out to a restaurant or may use a smart phone app such as the KidneyDiet® application (Pain Free Living, Inc., Whitby, Canada) to look up nutrient information. Some nutrient databases are available that list all data per 100 g of food product, which is probably more helpful to the food and nutrition professional than to the patient or consumer.

The US Department of Agriculture Food and Nutrition Database is an excellent source of information for both frozen and restaurant pizza products and was used primarily for the purposes of this article. It lists a variety of nutrient contents including the most currently available information on phosphorus, potassium, and sodium content of pizzas. In addition, one can toggle back and forth between various serving sizes including a standard slice, a whole pie, and a 100-g serving, whichever is the most useful. Serving sizes were shown to vary widely. The serving sizes for frozen pizza tended to be bigger than those for restaurant products and even among restaurant pizza; the sizes of the slices varied from the traditional wedge serving to small square slices. Products like thin crust pizza with few or no toppings weighed less overall than a thicker crust pizza with "the works" on it. Information on ingredients of various pizza brands was obtained from the company or manufacturer Web sites.

Table 1 contains nutrient information for selected frozen brands, including some that are missing data on phosphorus content but which were still included as they are among the top 10 leading frozen pizza brands sold in the United States.[4] The first column indicates the pizza brand and style and includes the serving size of the slice expressed as a fraction of the entire pizza as well as in grams. Column 2 indicates phosphorus content per slice in milligrams, column 3 indicates potassium content per slice in milligrams, column 4 indicates sodium content per slice

Saint Francis Outpatient Dialysis, Saint Francis Hospital, Tulsa, Oklahoma

Financial Disclosure: The author declares that there are no relevant financial interests.

Address correspondence to Jacqueline R. Abels MA, RD, CSR, LD, Saint Francis Outpatient Dialysis, Saint Francis Hospital, 6161 S. Yale Avenue, Tulsa, OK 74136. E-mail: jrabels@saintfrancis.com.

1051-2276/$36.00

http://dx.doi.org/10.1053/j.jrn.2015.02.002

Table 1. Pizza Comparison Chart: Frozen

Brand, Type of Pizza, Size of Slice	Phosphorus (mg Per Slice)	Potassium (mg Per Slice)	Sodium (mg Per Slice)	Added Phosphate
DiGiorno, cheese rising crust, 1/4 of pizza = 183 g*	441	359	1274	Yes
DiGiorno cheese thin crust, 1/4 of pizza = 161 g	380	375	815	No
DiGiorno pepperoni rising crust, 1/4 of pizza = 207 g	466	439	1538	Yes
DiGiorno pepperoni stuffed crust, 1/4 of pizza = 179 g	483	320	1348	Yes
DiGiorno pepperoni thin crust, 1/4 of pizza = 145 g	309	389	961	No
DiGiorno supreme rising crust, 1/4 of pizza = 227 g	479	477	1616	Yes
DiGiorno supreme thin crust, 1/4 of pizza = 155 g	290	431	860	Yes
Freschetta Brick Oven 3 meat medley, 1/5 of pizza = 131 g	N/A	250	960	Yes
Freschetta Brick Oven 5 Italian cheese, 1/4 of pizza = 144 g	N/A	200	930	Yes
Freschetta Brick Oven chicken club, 1/4 of pizza = 155 g	N/A	230	830	Yes
Freschetta Brick Oven mushroom/spinach, 1/5 of pizza = 128 g	N/A	260	610	Yes
Freschetta Brick Oven pepperoni/Italian cheese, 1/5 of pizza = 129 g	N/A	220	930	Yes
Freschetta Brick Oven zesty Italian supreme, 1/5 of pizza = 132g	N/A	210	780	Yes
Freschetta Naturally Rising 4 cheese medley, 1/5 of pizza = 148 g	N/A	260	900	No
Freschetta Naturally Rising Canadian bacon/pineapple, 1/6 of pizza = 130 g	N/A	220	760	Yes
Freschetta Naturally Rising classic supreme, 1/6 of pizza = 146 g	N/A	270	910	No
Freschetta Naturally Rising Margherita, 1/6 of pizza = 129 g	N/A	240	710	No
Freschetta Naturally Rising meat medley, 1/6 of pizza = 136 g	N/A	270	930	Yes
Freschetta Naturally Rising sausage/pepperoni, 1/6 of pizza = 139 g	N/A	290	920	No
Freschetta Naturally Rising signature pepperoni, 1/6 of pizza = 129g	N/A	250	870	No
Kashi mushroom trio/spinach, 1/3 of pizza = 113 g	132	210	663	No
Kashi roasted vegetable, 1/3 of pizza = 116 g	132	210	633	No
Kashi, Margherita, 1/3 of pizza = 113 g	139	231	633	No
Kashi, Mediterranean, 1/3 of pizza = 120 g	193	202	637	No
Newman's Own BBQ chicken, thin crust, 1/3 of pizza = 133 g	N/A	N/A	750	No
Newman's Own 4 cheese medium crust, 1/4 of pizza = 135 g	N/A	N/A	700	No
Newman's Own Buffalo chicken, thin crust, 1/3 of pizza = 132 g	N/A	N/A	580	No
Newman's Own supreme medium crust, 1/4 of pizza = 145 g	N/A	N/A	790	No
Newman's Own uncured pepperoni medium crust, 1/4 of pizza = 134g	N/A	N/A	860	No
Red Baron, 4 cheese, classic Crust, 1/4 of pizza = 149 g	N/A	180	780	No
Red Baron, 4 meat, classic crust, 1/4 of pizza = 154 g	N/A	240	890	Yes
Red Baron, 5 cheese, thin crust, 1/3 of pizza = 139 g	N/A	230	840	No
Red Baron, pepperoni, classic crust, 1/4 of pizza = 146 g	N/A	210	860	No
Red Baron, pepperoni, thin crust, 1/3 of pizza = 149 g	N/A	270	1020	No
Red Baron, Singles, 4 cheese deep dish, 1 pizza = 159 g	N/A	320	840	No
Red Baron, Singles, cheese, deep dish, 1 pizza = 159 g	N/A	340	830	No
Red Baron, Singles, meat trio, deep dish, 1 pizza = 159 g	N/A	330	920	No
Red Baron, Singles, pepperoni deep dish, 1 pizza = 159 g	N/A	300	970	No
Red Baron, Singles, supreme deep dish, 1 pizza = 163 g	N/A	320	900	No
Red Baron, special deluxe, classic crust, 1/5 of pizza = 130 g	N/A	220	690	No
Red Baron, supreme, classic crust, 1/5 of pizza = 133 g	N/A	190	720	No
Red Baron, supreme, thin crust, 1/4 of pizza = 124 g	N/A	230	790	No
Tony's cheese, 1/3 of pizza = 137 g	N/A	210	600	Yes
Tony's meat-trio, 1/3 of pizza = 146 g	N/A	250	750	Yes
Tony's pepperoni, 1/3 of pizza = 134 g	N/A	220	650	Yes
Tony's sausage, 1/3 of pizza = 142 g	N/A	240	700	Yes
Tony's sausage/pepperoni, 1/3 of pizza = 140g	N/A	240	710	Yes
Tony's supreme, 1/3 of pizza = 149 g	N/A	250	710	Yes

*Pizza slices are shown as both a fraction and by weight in grams for comparison purposes.

in milligrams, and column 5 indicates whether the product has added phosphates. Where an "N/A" appears, it indicates that data were not available for that product. Table 2 gives the same information as Table 1 for restaurant pizza brands.

As a typical nutrient prescription for a hemodialysis patient is 2000 mg of sodium, 2000 mg of potassium and <1000 mg of phosphorus, it is easy to see how a few slices of some brands of pizza could push a patient over the limit of some or all of these nutrients for the entire day.[3] Tables 3 and 4 show the top 7 picks for "renal-friendlier" pizza for both frozen and restaurant pizza brands based on all 4 nutrition criteria listed in Tables 1 and 2 Although these top picks are certainly not ideal foods for the renal patient, they represent some options that are available. Figure 1 includes suggestions for counseling patients when selecting pizza brands so that if they do choose to indulge in one of America's favorite foods, they can make an informed choice regarding brands and portion sizes.