

Kidney disease: low phosphate diet

Dietetics

Information for Adult Patients

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Introduction

Phosphate is a mineral that your body needs to make healthy bones and tissues. Your kidneys help to control the amount of phosphate in your blood. When your kidneys are not working properly, they become less able to remove phosphate from the body. This causes the level of phosphate in your blood to gradually rise.

High phosphate levels in the blood can cause hardening of your blood vessels which increases the risk of heart disease and strokes. It can also cause calcium deposits (like chalk) in the skin and other parts of your body. A high phosphate level can affect your bones too, making them ache and become brittle.

For more information about kidney disease and phosphate, scan the QR code for a short video.



What can I do?

Phosphate levels can be reduced by following 3 steps:-

Step 1: Reduce your intake of added phosphate, **also known as inorganic phosphate.**

Step 2: Reduce your intake of phosphate naturally found within food, **also known as organic phosphate.**

Step 3: Take your phosphate binders (if they are prescribed)

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Phosphate in food

Phosphate is found in all foods but some foods contain more than others. Also, the amount of phosphate that is absorbed from food varies, depending on food category.

2 types of phosphate are found in food:-

- Inorganic phosphate as additives and preservatives.
- Organic phosphate.

Step 1: Reduce your intake of inorganic phosphate

Inorganic phosphate is found in **processed foods** as additives and preservatives.

- This added phosphate is highly absorbed from food, so although the amount in the food may be low, it is almost entirely absorbed by your body into your blood.
- The only way to know if a food has added phosphate is to look at ingredients labels

Phosphate-containing additives are used to improve the flavour of food, extend shelf life and as a raising agent. The types of foods in which these additives are found are processed meat and poultry (packet cold meats / sausages / bacon / chicken products), processed cheeses, fast food, drinks, bakery products (cakes and breads) and other processed foods.

Food manufacturers do not have to add the phosphate content of foods to nutrition labels. Look at the ingredients lists and avoid foods that have phosphate-containing additives. Different brands of the same foods sometimes use different additives so you may be able to find a brand without added phosphate. It will be indicated by names or E numbers. The phosphate additives to look out for are shown below:-

E number	Phosphate additive name
E338	Phosphoric acid
E339	Sodium phosphate
E340	Potassium phosphate
E341	Calcium phosphate
E343	Magnesium phosphate
E450	Diphosphate
E451	Triphosphate
E452	Polyphosphate

The easiest way to avoid having lots of phosphate additives is by eating more fresh or unprocessed foods. When you are eating out, many restaurant chains have information regarding ingredients. Do not be afraid to ask if this information is available or check their website.

When baking, try to avoid recipes that use self-raising flour. The raising agent used within it contains a phosphate additive (calcium phosphate). Phosphate additives are also in baking powder. If you enjoy baking, speak with the dietitian who can make some alternative suggestions.

Step 2: Reduce your intake of organic phosphate

Foods high in protein tend to contain more natural phosphate. For example, meat, fish, eggs, milk, yoghurt, nuts, beans and pulses

- Natural phosphate is absorbed less than added phosphate, but varies depending on the food.
- Phosphate in animal foods (meat, fish, eggs, milk and yoghurt) is absorbed more than phosphate from non-animal foods (pulses, nuts).
- For good balance of protein and phosphate, meat, fish and pulses are better choices than dairy foods such as cheese, milk and yoghurt. If you use a lot of cheese, milk and yoghurt, the dietitian will be able to guide you on suitable amounts

How can I put step 1 and step 2 into practice?

The following tables give guidance on how to put low phosphate diet advice into practice whilst still providing a balanced diet.

Meat, Poultry and Eggs	
Higher in phosphate - Limit	Lower in phosphate - Choose
<p>Processed meat and poultry products containing phosphate additives (check labels for the names of additives or E numbers)</p> <p>Fresh meat and poultry portions that are bigger than 100g (4oz) on a regular basis</p>	<p>100g (4oz) fresh meat per meal (beef, lamb, pork, venison, rabbit)</p> <p>100g (4oz) fresh poultry per meal (chicken, turkey)</p> <p>100g processed meat and poultry that do not contain phosphate additives (NB. These types of food are likely to be high in salt)</p> <p>Eggs can be eaten freely. Most of the phosphate is in the yolk so egg whites are very low in phosphate</p>

Fish

Higher in phosphate - Limit	Lower in phosphate - Choose
<p>Processed fish products containing phosphate additives (check labels for the names of additives or E numbers)</p> <p>Fresh fish portions that are bigger than 150g (6oz) on a regular basis, particularly oily fish such as herring, salmon, trout, mackerel</p> <p>Fish with bones that can be eaten (whitebait, kippers, sprats)</p> <p>Monkfish, swordfish, calamari, scampi, tinned sardines (not boneless and skinless), brown crab meat,</p> <p>Avoid eating fish skin and bones</p>	<p>Processed fish products that do not contain phosphate additives (NB. These types of food are likely to be high in salt)</p> <p>100 to 150g (6oz) fresh fish</p> <ul style="list-style-type: none"> • Aim for the smaller portion size of oily fish <p>Tinned fish - boneless and skinless (salmon, tuna, mackerel, sardines)</p> <p>Fish paste, taramasalata, seafood sticks</p> <p>100g portion of shellfish (prawns, white crab meat, mussels, scallops)</p>

Cheese

All cheese contains a lot of phosphate except those shown on the right of the table. Limit the amount (portion size) of cheese that you eat and try to limit to once or twice per week.

Higher in phosphate - Limit	Lower in phosphate - Choose
<p>All hard cheese (Cheddar-type, Red Leicester, Lancashire, Double Gloucester, Caerphilly)</p> <p>Blue cheese (stilton, danish blue, dolcelatte). Dutch cheese (Edam and Gouda), Swiss cheese (Emmental, Gruyere)</p> <p>Halloumi, parmesan, paneer, processed cheese (cheese triangles, cheese slices, cheese spreads e.g. Primula, Dairylea)</p> <p>Softer cheeses (Feta, camembert, brie, white stilton, goats, mozzarella, quark) contain less phosphate than those shown above, but will still provide a significant amount of phosphate to your diet if you eat them often and in large portions</p> <p>Pizza</p> <ul style="list-style-type: none"> • Covered in cheese • Try to avoid more than 1 slice 	<p>Cottage cheese, ricotta, mascarpone, cream cheese e.g. Philadelphia</p> <p>Vegan cheese that does not contain phosphate additives</p>

Plant based protein

Plant-based protein foods may contain high amounts of potassium.
The dietitian can advise on lower potassium alternatives.

Higher in phosphate - **Limit**

Processed plant-based protein foods containing phosphate additives (check labels for the names of additives or E numbers)

Seeds

- These contain high amounts of phosphate but it is poorly absorbed
- Seeds are often used to sprinkle on foods. Keep to a small spoonful. These are high in potassium

Nuts

- These contain high amounts of phosphate but it is poorly absorbed.
- Unprocessed nuts (NOT dry roasted or salted) can be eaten in small amounts up to 25g per day. These are high in potassium

Lower in phosphate - **Choose**

150g (6oz) Quorn, Tofu, textured soya protein, pea protein per meal. This may be as pieces, mince, burgers and sausages (check no phosphate additives)

100 to 150g (4 to 6oz) beans and lentils (pulses) per meal OR ½ of a 400g tin (drained weight about 240g)

Avoid combining meat/fish/poultry with pulses in the same meal as all protein containing foods contain phosphate.

NB. If you need to be careful with high potassium foods too, the dietitian can advise on pulses that are lower in potassium.

Milk (Dairy and non-dairy) and Milk products

Higher in phosphate - **Limit**

Evaporated milk, condensed milk

Cows (whole, semi-skimmed, skimmed), soya and goats milk

- Avoid drinking glasses of milk or using milk to make puddings and sauces.
- Avoid having more than 200ml (1/3 pint) per day

Plant based milks containing phosphate additives (check labels for the names of additives or E numbers)

Lower in phosphate - **Choose**

Plant-based milks (rice, oat, nut) that do not contain phosphate additives.

Crème fraiche, a small amount of cream (single or double).

Cereal and cereal products

Higher in phosphate - Limit	Lower in phosphate - Choose
<p>Naan bread, crumpets, scones</p> <p>Tortilla wraps and pre-packaged chapatti, pancakes and waffles, poppadom containing phosphate additives (check labels for the names of additives or E numbers)</p> <p>Sourdough bread</p> <p>Baking powder</p> <p>Self-raising flour (this is made from plain flour with added baking powder)</p> <ul style="list-style-type: none"> • Try to find recipes using plain flour • Avoid recipes that use self-raising flour and additional baking powder. More information is available about home baking 	<p>Bread (white, brown, granary, wholemeal), bread rolls, pitta bread, baguette, ciabatta, bagels, sandwich thins, plain brioche, plain crackers, English muffins</p> <p>Tortilla wraps that do not contain phosphate additives</p> <p>Chapatti – fresh or those that do not contain phosphate additives</p> <p>Pancakes – fresh (these will contain milk) or those that do not contain phosphate additives</p> <p>Plain flour (white, brown, wholemeal), rice flour, corn flour, chapatti flour, millet flour, rye flour</p> <p>Rice, pasta, noodles, couscous, bulgur wheat, polenta, cornmeal, maizemeal, quinoa (this is high in potassium)</p> <p>Breakfast cereals (for example, Cornflakes, Rice Krispies, porridge oats, Weetabix, Shredded Wheat)</p> <ul style="list-style-type: none"> • Usually eaten with milk so limit the amount of milk you use or choose a lower phosphate milk alternative)

Savoury foods and snacks

Higher in phosphate - Limit	Lower in phosphate - Choose
<p>Tortilla chips, cheese biscuits (for example cheddars), twiglets</p> <p>Marmite, peanut butter</p>	<p>Popcorn, potato crisps, breadsticks, prawn crackers, corn snacks (for example Wotsits, Monster munch), cream crackers</p> <p>NB. If you need to be careful with high potassium foods too, the dietitian can advise on snacks that are lower in potassium.</p>

Sweet, Snacks, Puddings and Sweets

Higher in phosphate - **Limit**

Yoghurt and milk puddings (custard, rice pudding) are high in phosphate as they are made from milk

- Avoid having more than 2 small portions per week (125g)
- A few spoons of yoghurt in cooking will be acceptable

Shop-bought cakes, biscuits, sponge puddings, tarts and pies containing phosphate additives (check labels for the names of additives or E numbers)

Marzipan, Indian sweets made with milk powder and ground nuts

Chocolate

- Bars (dairy milk, twix)
- Chocolate-covered biscuits, cakes and ice cream
- Plain chocolate (higher cocoa solids) does have less phosphate than milk or white chocolate but will still provide a significant amount of phosphate to your diet if you eat it often or in large quantities.
- NB. All chocolate is high in potassium.

Lower in phosphate - **Choose**

Meringue-based pudding (pavlova), home-made puddings that can be made using plain flour or shop bought pastry (jam tart, fruit pie), mousse (fruit-flavoured), tiramisu

Shop-bought cakes, biscuits, sponge puddings, tarts and pies that do not contain phosphate additives

- Although these contain less phosphate than those with phosphate additives, try to limit the amount of these foods (in particular, biscuits) as they still contain some natural phosphate

Boiled sweets, chewing gum, jellies and mints

Ice lollies, fruit sorbet, 1 small scoop ice cream

Drinks

Higher in phosphate - **Limit**

Soft drinks containing phosphate additives such as Cola drinks, Dr Pepper, Oasis (check labels for the names of additives or E numbers)

Hot chocolate, Cocoa, malted milk drinks (Ovaltine, Horlicks)

Beer and cider.
The amount of phosphate will increase depending on how much you drink. Try to keep to 1 pint occasionally

Lower in phosphate - **Choose**

Soft drinks that do not contain phosphate additives such as lemonade, Lilt, Fanta, diluting squash, flavoured sparkling water

Coffee and tea

- The milk should come from your milk allowance

Spirits

Fruit and Vegetables (Including potato)	
Higher in phosphate - Limit	Lower in phosphate - Choose
	<p>All fruit and vegetables are naturally low in phosphate. - Aim to have 5 portions per day</p> <p>Potatoes, yam, sweet potato are naturally low in phosphate</p> <p>NB. Potatoes and some fruit and vegetables are high in potassium. If you need to be careful with high potassium foods too, the dietitian can advise on suitable options</p>

Step 3: Take your phosphate binders (if they are prescribed)

In addition to dietary changes, you may also be prescribed some tablets known as phosphate binders. There are many different options available and these are listed below. Your doctor or dietitian can talk about these with you.

Name of phosphate binder
Calcium carbonate (Adcal, Calcichew)
Calcium acetate (Phosex, Renacet)
Sevelamer hydrochloride/carbonate (Renvela, Renagel)
Lanthanum carbonate (Fosrenol)
Sucroferric oxyhydroxide (Velphoro)
Calcium acetate & magnesium carbonate (Osvaren)

These tablets work by binding with phosphate in food to reduce the amount of phosphate that can be absorbed from it by the body. As a general rule, they should be taken with food (either just before or with the food) **Except for Lanthanum** which should be taken immediately after food.

Check the label on your medicine for advice on how to take the phosphate binder you have been prescribed. You will need to either chew the tablet or swallow it whole.

If you are not eating then you do not need to take a phosphate binder as it will not work. The dietitian can advise you on how you can match your tablets with your food to get the most benefit from them.

If you are in hospital

The food that you are given in hospital may contain more phosphate than you usually eat at home, for example milky puddings and cheese. When people are in hospital and are unwell, they often do not eat as well as at home. Therefore, we try to balance the phosphate content of the menu with comforting foods to encourage people to eat, such as cheese and milk puddings. If you are eating well in hospital then try to avoid these choices like you would do at home.

Also, medicines may be given to you between meals. You can keep your binders until you eat to make sure you are binding phosphate well.

If you have dialysis treatment at a Dialysis Unit

You will be given biscuits with a drink at dialysis. Some of the biscuits contain phosphate additives. Try and avoid these and try to keep to 1 packet only. The dietitian can advise on the better choices.

Further information:

Kidney Care UK www.kidneycareuk.org

Kidney Kitchen <https://www.kidneycareuk.org/about-kidney-health/living-kidney-disease/kidney-kitchen/>

You can also access your blood results via Patient Knows Best by registering here: <https://my.patientsknowbest.com/>

Contact details:

Renal dietitians: 01162588002

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Previous reference:

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