

## Department of Nutrition and Dietetics

# Renal Disease - Low phosphate diet

### What is phosphate?

Phosphate (or phosphorus) is a mineral found in a wide range of foods. Phosphate combines with calcium in our bones to keep them strong.

### Why is the phosphate level in my blood high?

Healthy kidneys are usually able to control the level of phosphate in the blood by filtering out any excess. If your kidneys are not working properly, phosphate levels tend to rise.

The aim of treatment is to maintain blood phosphate levels as follows:

Not on dialysis: 0.9 – 1.5 mmol/l

When on dialysis: 1.1 – 1.7 mmol/l

### Why is it important to avoid high phosphate levels?

In the short term a high level of phosphate in your blood can cause:

- red and sore eyes and itchy skin.

In the long-term, high levels of blood phosphate can cause:

- weaker bones and joint pain
- hardening of blood vessels, which increase the risk of cardiovascular disease.



## **Where is phosphate found?**

Phosphate is found naturally in a wide range of different foods and can also be added to food during manufacturing.

## **How can I help control my phosphate levels?**

There are 3 steps you can take to help control your phosphate levels:

- Step 1:                Reduce your intake of phosphate additives.
- Step 2:                Reduce your intake of high phosphate foods whilst making sure you have enough protein.
- Step 3:                Take your phosphate binders (if prescribed)

\*If you find you are unable to complete step 1/ 2, discuss with your dietitian or renal team about starting with step 3.

## **Step 1: Reduce your intake of phosphate additives**

Manufacturers add phosphate to foods for a variety of reasons, such as keeping foods moist, improving their taste/texture, or extending their shelf life.

- 50% of the phosphate we eat could come from food additives.
- 90% of phosphate from additives is absorbed by the body compared to only 40 – 60% of phosphate naturally found in foods.

Swapping from processed foods to fresh foods can really make a difference.

- Processed meat can contain nearly 70% more phosphate than fresh.
- Reducing your intake of processed food helps reduce your salt intake too

Food manufacturers do not have to state phosphate content on the packaging. However, by checking the ingredients list for either the E number or the name will help you to find foods containing phosphate additives.

Here is a list of the additives that contribute the most phosphate in processed foods:

E338	Phosphoric acid
E339	Sodium phosphates
E340	Potassium phosphates
E341	Calcium phosphates
E343	Magnesium phosphates
E450	Diphosphates
E451	Triphosphates
E452	Polyphosphates
E541	Sodium aluminium phosphates

A handy wallet size card listing the above is available to help when shopping. If interested, please let your renal dietitian know.

## Patient Information

<b>Food / Drink</b>	<b>Foods high in phosphate additives: try to reduce</b>	<b>Lower phosphate alternatives</b>
Meat	Processed chicken, sausages, bacon, ham, salami, frozen beef burgers, tinned meats, meat paste	Fresh chicken, turkey, beef, lamb, pork, homemade beef burgers / meatballs.
Fish	Frozen fish/shellfish Fish fingers/cakes. Battered or crumbed fish Fish paste	Plain fresh fish: haddock, cod, plaice, salmon, trout. Homemade fish cakes. Tinned fish: salmon, tuna, mackerel, sardines (boneless and without skin).
Cereals	Cheerio's, Coco Pops, Pop Tarts, instant porridge such as Readybrek.	Weetabix, porridge oats, Rice Krispies, Cornflakes, Shredded Wheat, Special K, Bran flake and muesli
Cheese	Cheese slices/strips, Primula cheese, cheese triangles	Hard cheese - max of...../ week Cream, cottage or ricotta cheese.
Potatoes*	Frozen, chilled and dried potato products such as potato waffles, Smash, potato cakes	Fresh potatoes, homemade chips, wedges, roast potatoes (parboiled).
Bakery	Baking powder & self-raising flour Cake/biscuit/pancake mixes. Pre-prepared baked puddings. Scones, naan bread, crumpets	Homemade cakes and biscuits – try to avoid recipes using self-raising flour and baking powder such as shortbread. Croissant, English muffin, bagels.
Drinks	Dark coloured soft drinks such as Coca-cola, Pepsi, Dr Pepper, Oasis, iced tea Hot chocolate, Ovaltine, Horlicks, powdered milk (incl. instant latte or cappuccino), milkshakes, drinking yogurt Beer, wine	Lemonade, Fanta, ginger beer, Lilt, Ribena, Iron Bru, sparkling water, tea, soda water. Diluted fruit squash. Milk – within ½ pint (250ml) allowance Spirits

\*Please note these foods are also high in potassium

Adapted, original from Central Manchester Foundation Trust Renal Dietitians

## Step 2: Reduce your intake of high phosphate foods whilst making sure you have enough protein

Protein rich foods, such as meat, fish, pulses, nuts, and especially dairy foods contain phosphate. However, these foods are an important part of any diet since they are also rich sources of protein.

A diet containing insufficient protein can cause protein malnutrition, which can decrease the body's resistance to infection, delay recovery from illness and is associated with poor health outcomes. Your dietitian will guide you to appropriate amount of protein for you.

### Dairy / Dairy alternatives

High phosphate	Medium phosphate	Low phosphate
Cheese spreads like Dairylea, Primula. Processed cheese such as cheese slices.	All hard dairy cheese including– max of ..... / week	Cream cheese like Philadelphia cheese. Cottage cheese, ricotta cheese.
Vegan nut-based cheese such as Nush, Mouse's Favourite		Vegan Coconut Oil/Soya based cheese such as supermarket own brands, Violife
Condensed, evaporated, dried, sterilised, UHT milk Tinned coconut milk	Cow's milk (limit to ½ pint/300mls daily) OR 1 pint/600ml of a milk substitute*: Fresh soya milk UHT coconut/oat/rice milk	Milk substitutes: Fresh hemp milk can be drunk freely within your fluid restriction
Yogurt (substitute ¼ pint/150mls of cow's milk for one 125g pot yogurt OR 1/3 pint/200mls of fresh soya milk for one 125g pot soya yogurt)	Fromage frais	Crème fraiche

## Patient Information

\* The phosphate content of cow's milk substitutes can vary greatly between brands. Additionally, only soya milk has similar protein content to cow's milk; ask your dietitian for further help.

### Meat / Protein alternatives

High phosphate	Medium phosphate	Low phosphate
Beef burgers (take away)	Beef burgers (shop bought)	beef burgers homemade
Processed meats* such as ham, sausages, sausage rolls, breaded or crumbed chicken/turkey products such as nuggets, drummers, twizzlers Offal, paté		Fresh chicken, turkey, lamb, pork, beef, duck, rabbit, venison
Quorn, Textured Vegetable Protein (TVP)	Pulses (lentils and beans)	Soya or pea protein-based veggie burgers, sausages or pieces, soya mince, tofu, tempeh

\* Please note these foods are also high in salt

### Fish and shellfish

High phosphate	Medium phosphate	Low phosphate
Pilchards, sardines, sea bass, monkfish or whitebait	Cod, salmon (fresh), trout mackerel, kippers*	Tinned salmon (boneless and without skin) or tuna (fresh and tinned)
Clams, crab (fresh), crayfish, mussels, oysters, scampi	Prawns, shrimps, lobster, squid or cockles	Tinned crab or crab sticks, scallops or winkles
Taramasalata, cod roe or fish paste.		

\* Please note these foods are also high in salt

## Foods high in fat and sugar\*

High phosphate	Medium phosphate	Low phosphate
Biscuits/cakes containing chocolate, nuts or coconut. Scones, rock cakes or Scotch pancakes.	Sponge cakes, Danish pastry, plain flapjack, tea cake	Cream cakes, doughnuts, jam tarts Plain biscuits such as Digestives, Rich Tea, ginger biscuits, jam cream biscuits
Bombay mix, nuts, seeds, Twiglets.	Pretzels, tortilla chips	Breadsticks, cream crackers, popcorn, corn snacks such as Skips/Wotsits
Chocolate, fudge, caramels. Indian snacks made from condensed milk/nuts/coconut	Toffee, Liquorice Allsorts, Mars, Twix, KitKat	Marshmallows, Turkish Delight, jelly sweets, mints, boiled sweets.

\* Aim to use these foods carefully unless you have a poor appetite or have lost weight recently. Ask to speak to the dietitian for further advice on these foods.

## Miscellaneous foods high in phosphate

- Bovril and Marmite are high in both phosphate and salt and are best used sparingly.
- Nut butters, tahini paste and hummus.
- Dried powdered food items: sauces (especially cheese-based), dessert mixes, soups, instant pasta dishes, instant noodles, and dried milk.

## Miscellaneous foods low in phosphate

- Spices, garlic, herbs, pepper, and condiments such as mustard, tomato ketchup, brown sauce, salad cream, mayonnaise, and vinegar.

### Step 3: Take your phosphate binders

You may be prescribed tablets called phosphate binders that, along with a low phosphate diet, help reduce the levels of phosphate in your blood. These work by soaking up some of the phosphate from the food in our stomach so it is not absorbed. For these tablets to work it is important to take them with the right foods and at the right time.

Phosphate binders	When to take	How to take
Calcium acetate (Renacet®) 475mg tablet      950mg tablet 	With meals	Swallow whole
Calcium acetate (Phosex®) 1g 	With meals	Swallow whole
Calcium carbonate (Calcichew®) 1.25g 	Before meals	Suck or chew
Lanthanum (Fosrenol®) 500mg/750mg/1g tablets 750mg/1g/sachet (powder) 	With/immediately after food	Tablet: Chew Sachet: Mix with a small quantity of soft food (not with water/liquid)
Sevelamer hydrochloride (Renagel®) 800mg/tablet 	With meals	Swallow whole
Sevelamer carbonate (previously Renvela®) 800mg/tablet      2.4g/sachet	With meals	Tablet: Swallow whole Sachet: Disperse each sachet in 60ml water

**Your phosphate binders are:** .....

**Tips:**

- Take phosphate binders every time you have a meal or a snack that contains phosphate such as milk, cheese, eggs, fish, poultry, or meat.
- There is no need to take phosphate binders with low phosphate foods such as bread, plain biscuits, crisps, and fruit.
- Remember to take your phosphate binders with you when you are away from home, for example when you are on dialysis or eating out (ask your dietitian for a pocket-sized tablet pot for easy storage whilst you are out and about).
- Phosphate binders should not be taken at the same time as iron tablets, or some antibiotics, as this makes them ineffective. Ask for advice from your pharmacist or doctor.

**Warning - Star fruit contains a chemical which can be dangerous to people with kidney problems. These should be avoided.**

Produced by Coventry Renal Dietitians, University Hospitals Coventry & Warwickshire NHS Trust.

Contact number: 024 7696 6151

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<b>Document History</b>	
Department:	Nutrition and Dietetics
Contact:	26151
Updated:	August 2022
Review:	August 2024
Version:	9
Reference:	HIC/LFT/366/07