



Managing phosphate intake: a guide for families

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## 1. Why do I need to reduce my child's dietary phosphate intake?

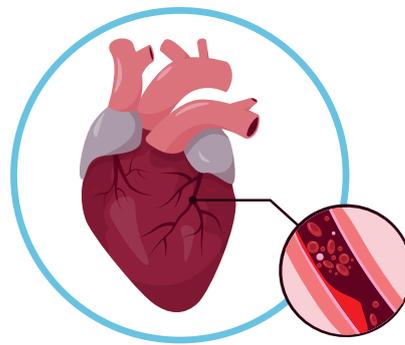
Phosphate is a mineral that is important for the development of strong bones and to produce energy for the body. Our kidneys control the level of phosphate in the body by getting rid of any excess in the urine. When your child's kidneys are not working properly, the phosphate levels in their blood may increase.

### What are the effects of high blood phosphate levels?



#### Short term

Red sore eyes, itchy skin and bone pain



#### Long term

Weak bones, poor growth and hardening of blood vessels, which can damage the heart

## 2. Which foods are high in phosphate?

There are two types of phosphate in our food and drinks:

- *Phosphate additives* which are added to some foods during their processing to help keep the food moist, improve its texture or color, or to extend its shelf life.
- Phosphate which occurs *naturally* in foods such as meat, milk and dairy products.

Limiting dietary phosphate intake from food additives and reducing some naturally occurring sources can help prevent high blood phosphate levels and protect your child's bones and heart.

## Are all phosphates equal?

The amount of phosphate we absorb from our diet varies depending on the source.

The phosphate in additives can be completely absorbed by the body. This is a concern as this can quickly cause your child's blood phosphate to rise. Limiting processed foods is a priority.

The phosphate that is found naturally in foods is less well absorbed (see table below). As these foods provide essential protein, vitamins and minerals, they are important for the growing child. However, it may be necessary to reduce certain natural sources such as milk, dairy products and eggs, as they often provide a significant amount of phosphate in your child's diet.

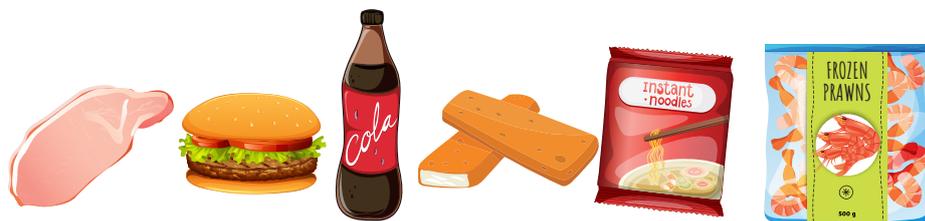
Source	Examples of foods	How much phosphate do we absorb into our body?
<b>Phosphate additives</b>	Processed meat and chicken, frozen fish products, processed cheese, cake and pancake mixes, dark colored soft drinks (such as colas)	Up to <b>100%</b>
<b>Naturally occurring phosphate</b>	Milk and dairy products (e.g. cheese, yogurt, ice cream), eggs, meat, fish, nuts	<b>40-60%</b>

### 3. Stepwise guide to reducing phosphate intake

#### Step 1

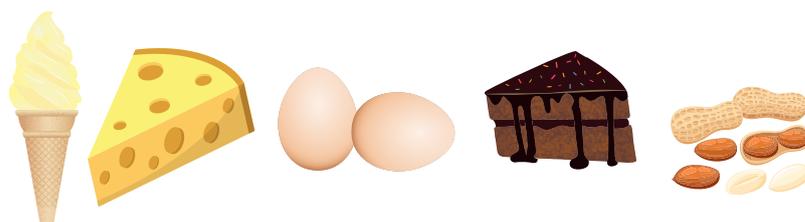
#### Limit phosphate additives

Choose fresh foods rather than processed foods



#### Step 2

#### Reduce intake of some foods naturally high in phosphate



## Step 1 Limit phosphate additives

### Preparing more foods from fresh at home

Processed foods are the main source of phosphate additives in the diet. Cooking more foods at home using fresh ingredients is encouraged.

### What type of foods contain phosphate additives?

The following table details those foods which may contain phosphate additives; their presence may be brand related.

<b>Fresh meat and poultry</b>	Fresh, raw meat and poultry could contain enhancers which include phosphate additives (see below for further details)
<b>Processed meat and poultry</b>	Processed meat and poultry e.g. sausages, burgers, breaded products (such as chicken nuggets)
<b>Fish</b>	Frozen processed and unprocessed fish and shellfish and breaded fish products (such as fish fingers)
<b>Bakery items</b>	Cakes, biscuits, crumpets, flour tortilla wraps, naan bread
<b>Dairy</b>	Dried milk products, milk desserts and yogurts, evaporated milk, cream, ice cream, sterilized and ultra-high temperature (UHT) milk, processed cheese (especially sliced or spreadable products)
<b>Potato products</b>	Chilled, dried and frozen products, such as chips and waffles
<b>Powdered food</b>	Sauces, instant dessert mixes e.g. pancake mixes
<b>Drinks</b>	Dark colored fizzy drinks. Chocolate or malt-based drinks

### How can I tell if phosphate additives are present?

Not all food labels will tell you if an item contains phosphate additives. Some are listed by name or as an E-number (see table below). You could check ingredient lists for these, or look for 'phos' as part of an ingredient name. These foods should be limited, or suitable alternatives found. In general, ready to eat, processed and 'fast food' are more likely to contain phosphate additives compared to fresh foods.

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

## Step 2

## Reduce intake of foods naturally high in phosphate

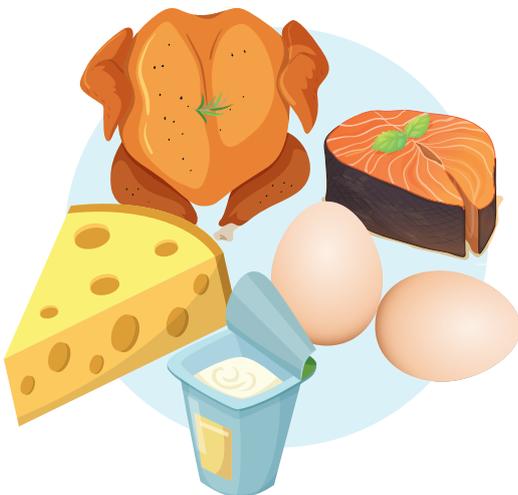
You may need to lower your child's intake of natural phosphate sources. These include milk and dairy products (e.g. cheese, yogurt, ice cream), eggs, meat, fish and nuts.

Your dietitian will help you with any changes you may need to make with your child's diet

### Feeding your baby

Breastmilk or whey-dominant infant formula is usually suitable. Some babies may need a specialized infant formula designed for babies with kidney problems.

Introduce solid foods around 6 months of age. If you think your baby is ready for solids before 6 months, discuss this with your dietitian. Depending on your baby's ability, foods can be either be a pureed texture, minced texture or be cut into little soft pieces. Use fresh ingredients as much as possible.



Start with vegetables and fruit and then gradually introduce natural phosphate foods such as dairy, eggs, fresh unprocessed meat, fish, chicken.

Even if your baby's phosphate level is normal, it is beneficial to limit the amount of easily absorbed phosphate consumed from processed foods.

## Phosphate swapping list

Some families find a dairy-based foods swap list useful. The table below lists foods containing similar quantities of phosphate. A daily allowance of these can be swapped for each other, making the diet more manageable and flexible.

Your dietitian or doctor will advise you on how much you can include in your child's diet.

## Phosphate swapping list

	1 pot (125g) or 3 tablespoons yogurt		1 thin slice hard of cheese (20g) or 1 heaped tablespoon of grated cheese
	2 small pots (2 x 50g) of fromage frais		1 slice of processed cheese or 1 cheese strip/string/triangle (check for phosphate additives) or 2 tablespoons of cottage cheese (40g)
	3 tablespoons or 1 pot (120g) custard or milk pudding		1 small slice of pizza
	1 small bar chocolate (50g) or 1 small packet of chocolate sweets		1 small bottle of probiotic drink

### 4. Are any medications high in phosphate?



Some medications contain phosphate. Your medical team will look at your current medications and will make adjustments if necessary.

## 5. Use of phosphate binders

Phosphate binders are often prescribed alongside dietary advice about phosphate intake to help manage your child's blood phosphate level.

This table details some practical points to help you get the best out of phosphate binders.

It is important that your child takes their phosphate binder **with meals and snacks** and not between meals.

The dose of phosphate binder should be **tailored to the amount of phosphate in your child's diet**, including both foods and drinks. Your doctor or dietitian will advise you about this.

Remember to give phosphate binders with **all snacks** which contain phosphate.

Some foods such as vegetables, fruit and cereal products (such as rice, bread, crisps, cakes and biscuits) may be low in phosphate, so if they are not eaten at the same time as a high phosphate food, you may not need to give a phosphate binder. However, **check food labels for possible inclusion of phosphate additives.**

If your child is having nasogastric or gastrostomy feeds, you may be able to mix the phosphate binders into the feed.

**Some phosphate binders may cause feed ingredients to settle out.** In this case you need to mix them with some water and put them down your child's tube at the beginning and/or end of the feeding period.

You may just prefer to give the phosphate binders by mouth before and/or after your child's feeding period. Discuss this with your child's dietitian or doctor.

## Notes

## 6. How to choose foods lower in phosphate

As your child gets older, their diet will become more varied. The following table provides suggestions of alternatives to foods and drinks high in phosphate additives. Some of the foods and drinks in this table aren't suitable for babies and young children.

	<b>Step 1.</b> Limit phosphate additives	<b>Step 2.</b> Reduce intake of some foods naturally high in phosphate	
	High in phosphate additives	High in natural phosphate	Lower phosphate alternatives
Milks	Ultra-High Temperature (UHT) milk products	Cow's milk - also avoid evaporated, condensed and powdered milk  Non-dairy creamers  Fortified soya milk	Dilute cow's milk with water (50:50)  Milk substitutes, including some plant-based milks such as oat milk  Avoid plant-based milks containing calcium phosphate
Bakery	Baked goods or puddings with phosphate-containing raising agents e.g. crumpets, muffins, scones, pastries, naan bread and tortillas/wraps	Foods containing chocolate or nuts	Baked goods without phosphate-containing raising agents* e.g. croissants, English muffins and hot cross buns  Plain or jam/cream filled biscuits, plain cakes, teacakes, cream cakes and doughnuts  Cream crackers, wholemeal or white bread, pitta bread, chapattis, rice cakes
Starchy foods	Frozen, chilled and dried potato products e.g. potato waffles, potato cakes		Fresh potatoes, homemade chips, wedges, roast potatoes  Rice, couscous, pasta
Breakfast cereals	Check the label for phosphate-containing additives	Cereals containing chocolate or nuts	Porridge oats, rice and wheat-based cereals
Dry product mixes	Cake, biscuit, pancake and dessert mixes  Packet sauces  Instant pasta or noodle dishes	Dried cheese, white sauce mixes	Pasta, rice, noodles with homemade sauces/flavourings
Meat	Frozen beef burgers or takeaway foods  Processed chicken e.g. chicken nuggets, Kievs and popcorn chicken  Sausages, bacon, ham, salami  Tinned meats, meat paste, pâté	Not usually limited but portion sizes may need to be reduced	Most fresh, unprocessed beef, lamb, chicken, pork, duck and turkey (check supermarket brands and choose options that do not contain phosphate additives)  Homemade sausages from a butcher's shop  Homemade beef burgers and meatballs

\* A phosphate free raising agent can be made using cream of tartar and sodium bicarbonate in place of baking powder. This may not be suitable if you are also restricting potassium intake.

**Step 1.**  
Limit phosphate additives

**Step 2.**  
Reduce intake of some foods naturally high in phosphate

	High in phosphate additives	High in natural phosphate	Lower phosphate alternatives
Plant-based protein	Some processed plant-based meals/products e.g. meat-free country pie, meat-free hot dogs, chicken-free crispy grills	Portion sizes may need to be reduced  Nuts* e.g. almonds, hazelnuts, peanuts, walnuts  Seeds* e.g. pumpkin, sesame, sunflower, tahini paste	Tofu, Quorn®, textured soya protein, soya or pea-based veggie burger, beans and pulses e.g. lentils, kidney beans and chickpeas
Fish	Shellfish  Processed fish products e.g. fish fingers/cakes, battered or crumbed fish  Fish paste	Portion sizes may need to be reduced	Fresh, unprocessed fish e.g. cod, haddock, salmon and tuna  Tinned fish: salmon, tuna, mackerel, sardines, pilchards (only if without bones and without skin)
Dairy	Processed cheese slices/strips/spreadable cheese	Hard cheese e.g. cheddar, edam  Yogurt  Ice cream	Cottage, cream or ricotta cheese  Small amount of hard cheese Vegan coconut or soya oil cheese  Cream, soured cream Crème fraiche  Jelly, sorbet, fruit lollies
Eggs	Some baked egg products e.g. quiche	Egg yolks	Egg whites  To make scrambled eggs (with 2 eggs) replace one of the whole eggs with 1 egg white
Spreads & dips	Processed cheese spreads Processed dips	Nut butters and chocolate spread	Biscuit spread, jam, marmalade, syrup, honey <sup>▲</sup>  Small amount of natural yogurt/sour cream/salsa/pureed vegetable dips  Hummus, guacamole and refried beans
Drinks	Dark colored fizzy drinks e.g. colas <sup>●</sup>  Chocolate or malt-based drinks	Cow's milk	Light colored fizzy drinks e.g. lemonade  Water, diluted fruit squash, cordials and some natural fruit juices  Coffee <sup>●</sup> , tea <sup>●</sup> , herbal and fruit teas

\* For babies, nuts and seeds should be ground or given as nut butter  
Whole nuts should not be given to children under 5 years of age

▲ Not below the age of 1 year

● Children under the age of 12 years should not have caffeine-containing drinks



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