



Managing phosphorus intake: a guide for families

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## Why do I need to reduce my child's dietary phosphorus intake?

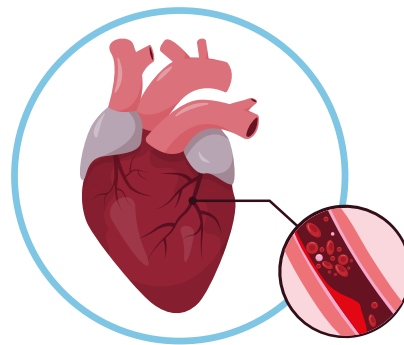
Phosphorus is a mineral that is important for the development of strong bones and to produce energy for the body. Our kidneys control the level of phosphorus in the body by getting rid of any excess in the urine. When your child's kidneys are not working properly, the phosphorus levels in their blood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

### What are the effects of high blood phosphorus 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

### Which foods are high in phosphorus?

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

- *Phosphorus 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.
- Phosphorus which occurs *naturally* in foods such as meat, milk and dairy products.

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

## Is all phosphorus equal?

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

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

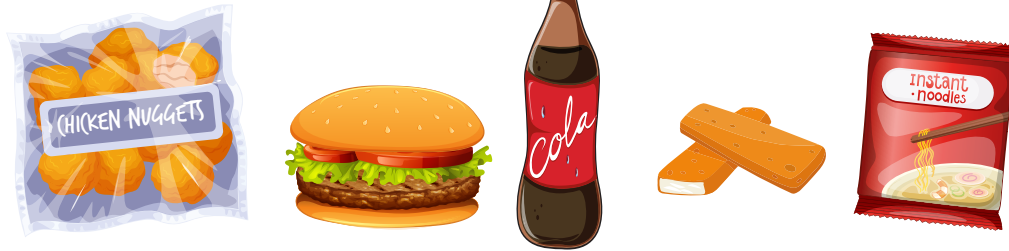
The phosphorus that is found naturally in foods is less well absorbed (see table below). As these foods provide essential protein, vitamins, minerals and fiber, they are important for the growing child. However, it may be necessary to reduce certain natural sources such as meat, milk, eggs, beans and nuts.

Source	Examples of foods	How much phosphorus do we absorb into our body?
<b>Phosphorus additives</b>	Processed meat and chicken, plant-based meat alternative and burgers, frozen fish products, processed cheese products, cake and pancake mixes, dark colored soft drinks (such as colas)	<b>Up to 100%</b>
<b>Naturally occurring animal-based phosphorus</b>	Milk and dairy products (e.g. cheese, yogurt, ice cream), eggs, meat, fish	<b>40-60%</b>
<b>Naturally occurring plant-based phosphorus</b>	Beans, lentils, soy, tofu, quinoa, nuts	<b>20-40%</b>

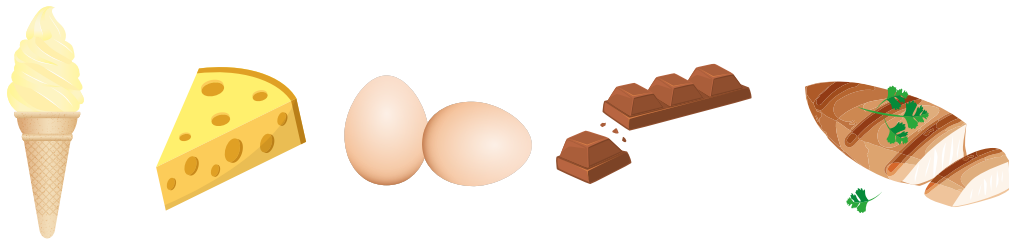
## Stepwise guide to reducing phosphorus intake

### Step 1 Limit phosphorus additives

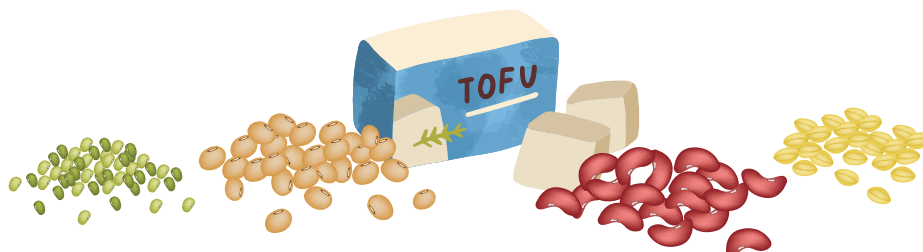
Choose fresh foods rather than processed foods



### Step 2 Reduce intake of some foods naturally high in phosphorus



### Step 3 Replace some of the naturally occurring animal-based phosphorus foods with plant-based foods



## Step 1 Limit phosphorus additives

### Prepare more foods from fresh at home

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

### What type of foods contain phosphorus additives?

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

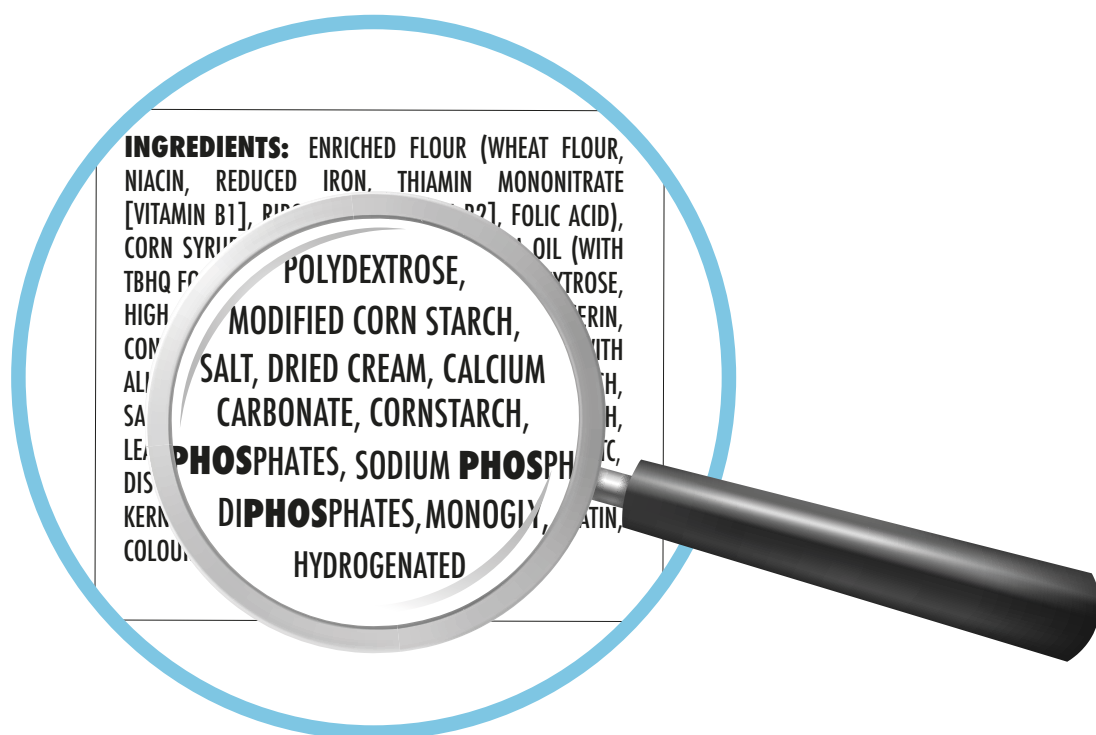
<b>Fresh meat and poultry</b>	Fresh, raw meat and poultry could contain enhancers which include phosphorus additives (see page 7 for further details)
<b>Processed meat and poultry</b>	Processed meat and poultry e.g. sausages, burgers, breaded products (such as chicken nuggets)
<b>Fish</b>	Frozen processed fish and breaded fish products (such as fish sticks)
<b>Processed plant-based meat alternatives</b>	Veggie burgers, vegetarian sausages, meat alternatives
<b>Bakery items</b>	Cakes, biscuits, 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 french fries and hash browns
<b>Powdered food</b>	Packaged sauces, instant dessert mixes e.g. pancake mixes
<b>Drinks</b>	Dark colored carbonated drinks. Chocolate drinks or malt-based drinks

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

Not all food labels will tell you if an item contains phosphorus additives. Some are listed by name (see table below).

Phosphoric acid	Diphosphates
Sodium phosphates	Triphosphates
Potassium phosphates	Polyphosphates
Calcium phosphates	Sodium aluminium phosphates
Magnesium phosphates	

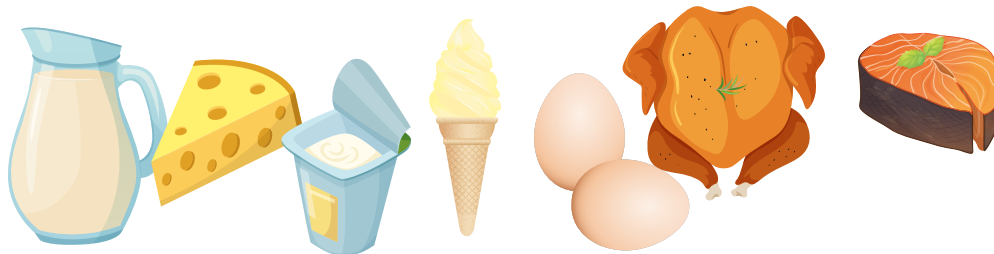
You can check ingredient lists for these, or look for 'phos' as part of an ingredient name. These foods should be limited, or suitable alternatives found. In general, ready to eat, processed and 'fast food' are more likely to contain phosphorus additives compared to fresh foods.



## Step 2

# Reduce intake of some foods naturally high in phosphorus











You may need to lower your child's intake of natural phosphorus sources. These include milk and milk products (e.g. cheese, yogurt, ice cream), eggs, meat and fish. See pages 12-13 for a guide to choosing foods which are lower in phosphorus.



The following foods contain similar amounts of naturally occurring phosphorus - your dietitian will advise you on how much you can give each day

The number of portions allowed may change depending on your child's blood results

## Portions

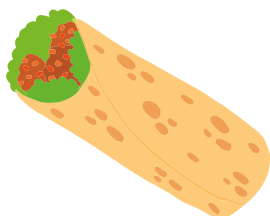
	1 egg		120ml or 1/2 cup natural yogurt
	120ml or 1/2 cup		120ml or 1/2 cup of milk pudding
	80ml cheese sauce (5 tablespoons)		2 scoops ice cream (120g)
	1 thin slice or 1 heaped tablespoon cheddar cheese (20g)		1 small chocolate covered cookie (50g)
	1 small portion of soft cheese		1/2 mini pizza (50g)
	Fruit yogurt (120g) or soy yogurt (120g)		



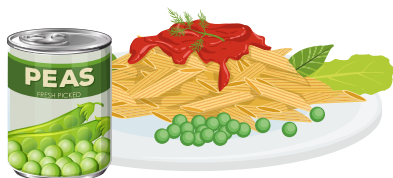
### Step 3

## Eat more plant-based foods

Plant-based foods provide important vitamins, minerals and fiber and the phosphorus in these foods is less well absorbed. Here are some ideas to increase the plant-based foods in your child's diet:



Replace some of the meat in Bolognese sauce, chilli con carne, burgers and burritos with lentils or beans



Add extra fresh, frozen or canned vegetables to pasta sauces, curries and stews and cut down on the amount of meat, chicken or fish



Reduce the amount of meat, fish, eggs or cheese in your child's sandwich filling and replace with hummus or mashed avocado; add some salad items such as cucumber or lettuce



Pack some raw vegetables into your child's lunch box, or give as a snack e.g. carrots, bell peppers, broccoli or cauliflower



Include a side salad with your child's meals e.g. salad greens, bulgar wheat, quinoa, couscous or rice with added seeds, nuts, celery, radishes, green onions and sweet corn

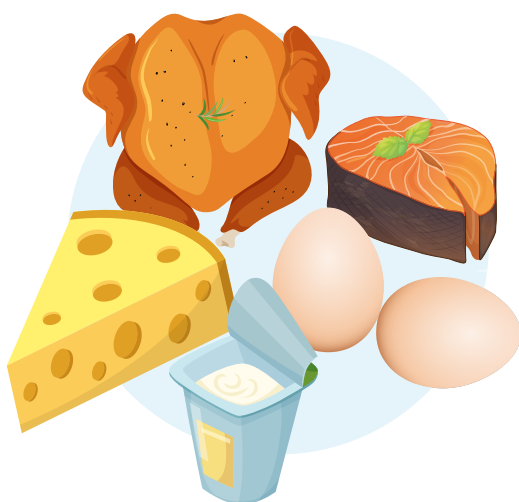
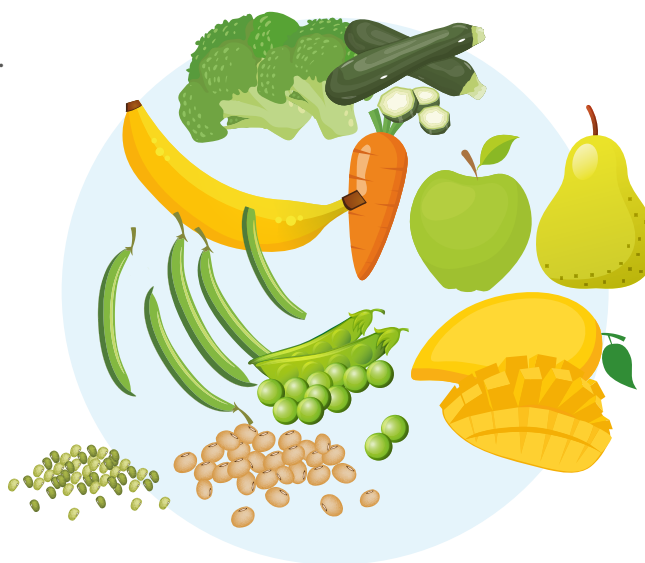


## Feeding your baby

Breastmilk or whey-based 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 a pureed texture, minced texture or cut into little soft pieces. Use fresh ingredients as much as possible.

Start with homemade vegetables and fruit.



Then gradually introduce natural phosphorus foods such as dairy, eggs, fresh unprocessed meat, fish or chicken. The introduction of these foods may need to be delayed, depending on your baby's level of kidney function.

Even if your baby's phosphorus level is normal, it is beneficial to avoid the easily absorbed phosphorus found in processed foods.

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

## Use of phosphorus binders

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

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

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

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

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

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

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

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

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

# How to choose foods lower in phosphorus

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

**Step 1.**  
Limit phosphorus additives

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

**Step 3.**  
Give more plant-based foods and choose lower phosphorus alternatives

	High in phosphorus ADDITIVES	High in NATURAL phosphorus	Lower phosphorus alternatives
Milks	<p>Ultra-high temperature (UHT) milk products</p> <p>Non-dairy creamer</p> <p>Plant-based milks containing a phosphorus additive</p>	<p>Cow's milk - whole and semi-skimmed, condensed and powdered milk</p>	<p>Dilute cow's milk with water (50:50)</p> <p>Milk substitutes, including some plant-based milks such as oat milk and almond milk<sup>†</sup></p>
Dairy	<p>Processed cheese slices/strips/cheese spread</p>	<p>Hard cheese e.g. cheddar, marble</p> <p>Yogurt</p> <p>Ice cream</p>	<p>Low sodium cottage cheese, cream or ricotta cheese</p> <p>Plant-based cheeses Vegan, coconut or soy oil cheese</p> <p>Cream, sour cream</p> <p>Jelly, sorbet, fruit lollipops</p>
Bakery	<p>Baked goods or puddings with phosphorus-containing raising agents e.g. muffins, scones, pastries, naan bread and tortillas/wraps</p> <p>Baked savory foods e.g. cheese bread, pizza</p>	<p>Foods containing chocolate</p>	<p>Baked goods without phosphorus-containing raising agents* e.g. croissants, English muffins and buns</p> <p>Plain or jam/cream-filled biscuits, plain cakes and doughnuts</p> <p>Crackers, whole grain and white bread, chapattis, rotis, rice</p>
Starchy foods	<p>Frozen, chilled and dried potato products e.g. french fries, hash browns</p>	<p>Macaroni and cheese mixes, cheese-based dishes, cheesy fries</p>	<p>Fresh potatoes, homemade fries, wedges, roast potatoes</p> <p>Rice, couscous, pasta, quinoa</p>
Breakfast cereals	<p>Check the label for phosphorus-containing additives</p>	<p>Cereals containing chocolate</p>	<p>Oats, rice-based and wheat-based cereals</p>
Dry product mixes	<p>Cake, biscuit, pancake and dessert mixes</p> <p>Packaged sauces</p> <p>Instant pasta or noodle dishes</p>	<p>Sauces made with milk</p>	<p>Pasta, rice, noodles with homemade sauces/seasonings</p>

\* A phosphorus 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.

<sup>†</sup> It is not advised to give rice milk drinks to young children.

**Step 1.****Step 2.****Step 3.**

	<b>High in phosphorus ADDITIVES</b>	<b>High in NATURAL phosphorus</b>	<b>Lower phosphorus alternatives</b>
<b>Meat</b>	<p>Frozen beef take out foods</p> <p>Processed chicken e.g. chicken nuggets and popcorn chicken</p> <p>Sausages, bacon, ham, salami</p> <p>Canned meats, meat paste, pâté</p>	<p>Fresh or frozen meats e.g. chicken, turkey, pork, beef and lamb</p> <p>Check meats from the supermarket for phosphorus additives</p>	<p>Try to reduce meat portion sizes</p> <p>Sausages made in a butcher's shop</p> <p>Homemade beef burgers and meatballs</p>
<b>Plant-based protein</b>	<p>Some processed plant-based meals/products e.g. meat-free hot dogs</p>	<p>Portion sizes may need to be reduced</p> <p>Nuts* e.g. almonds, hazelnuts, peanuts, walnuts</p> <p>Seeds* e.g. pumpkin, sesame, sunflower, tahini paste</p>	<p>Tofu, textured soy protein, soya or pea-based veggie burger, beans and pulses e.g. lentils, kidney beans and chickpeas</p>
<b>Fish and shellfish</b>	<p>Processed fish products e.g. fish sticks, breaded fish</p> <p>Fish paste</p>	<p>Fresh or frozen fish e.g. cod, haddock, salmon and tuna</p> <p>Canned fish: salmon, tuna, mackerel, sardines, pilchards (only if without bones and without skin)</p>	<p>Try to reduce fish portion sizes</p>
<b>Eggs</b>	<p>Some baked egg products e.g. quiche</p>	<p>Egg yolks</p>	<p>Egg whites</p> <p>To make scrambled eggs (with 2 eggs) replace one of the whole eggs with 1 egg white</p>
<b>Spreads &amp; dips</b>	<p>Processed cheese spreads</p> <p>Processed dips</p>	<p>Nut butters and chocolate spread</p>	<p>Jam, jelly, marmalade, syrup, honey<sup>▲</sup></p> <p>Small amount of sour cream/salsa/pureed vegetable dips</p> <p>Hummus, guacamole and refried beans</p>
<b>Drinks</b>	<p>Dark colored carbonated drinks e.g. colas<sup>●</sup></p> <p>Chocolate or malt-based drinks</p>	<p>Cow's milk</p>	<p>Light colored carbonated drinks with no phosphorus additives e.g. lemonade</p> <p>Water, and some natural fruit juices</p> <p>Coffee<sup>●</sup>, tea<sup>●</sup>, herbal and fruit teas</p>

\* 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.

## Notes

Notes

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**My dietitian is:** .....

**Telephone:** .....

**Email:** .....



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