Fibre.

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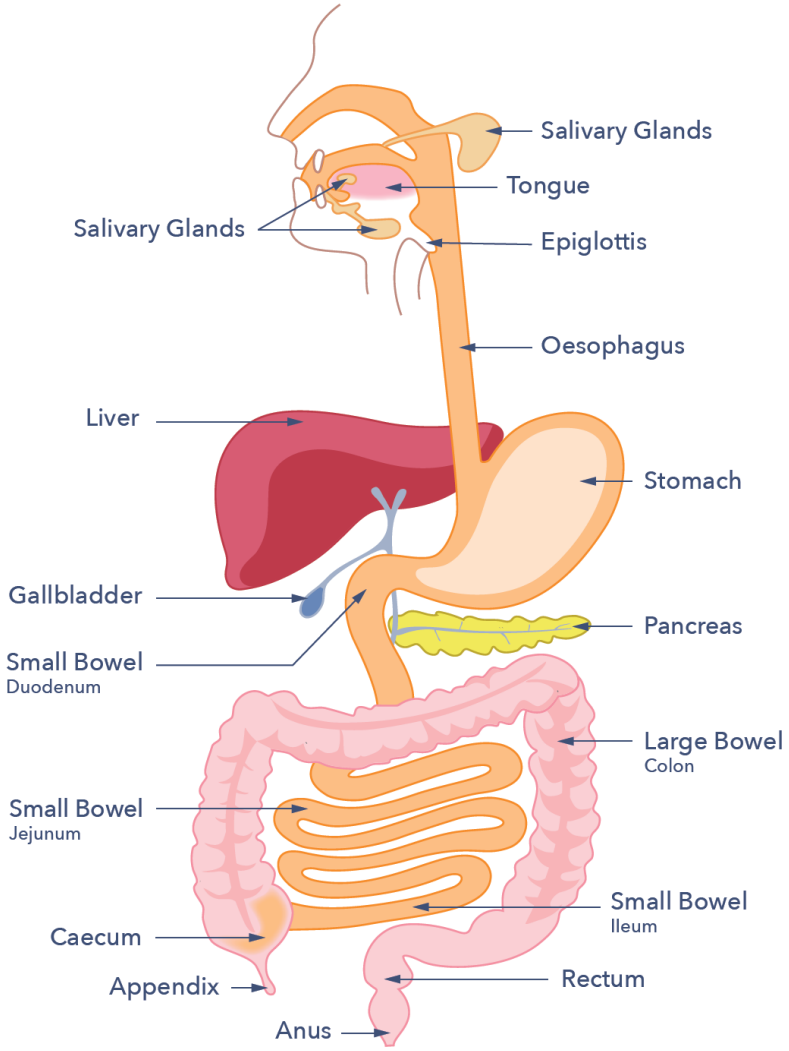
Guts UK is the charity for the digestive system. Funding research to fight diseases of the gut, liver and pancreas.

THE DIGESTIVE SYSTEM



OVERVIEW

What is fibre?

Have you been asked to change how much fibre you eat? Perhaps it was suggested that you eat more fibre to help with constipation? Or to cut some of it out if you are following a special diet for irritable bowel syndrome (IBS)? Or to eat it regularly but avoid it when you get symptoms if you have diverticular disease? Confused? Probably!

Fibre is both simple and quite complicated. In simple terms, fibre is the part of plant foods (fruits, vegetables, grains, beans, nuts, seeds) that you do not digest. It therefore ends up in your large bowel, where it is partially or fully broken down by gut bacteria. Fibre can make your poo bigger and softer and sometimes looser. It can produce gas, and in some people who are diagnosed with gut conditions bloating, wind and belly pains.

You may already know fibre can be taken in pill form or powder as a laxative. Fibre can also be used in food processing as gels or thickeners to make food look and feel smoother. The more we learn about fibre, the more complicated it looks.

The main characteristics of fibre that affect its function are:

- Solubility (how well it dissolves in water)
- Viscosity (how thick or fluid it is)
- Fermentability (how well it is broken down by our gut bacteria)

Unlike most other nutrients, the effect of fibre on our body can be fast. Part of the reason for this is that fibre comes in different shapes and sizes and the various types have different effects on the gut.

- Soluble fibre (found in foods such as oats, rye, barley, onions, leeks, root vegetables, apples and bananas) draws water through the small bowel wall and further down from the large bowel wall into the gut lumen. This makes the poo bigger, but also softer and easier to move along the gut. Resistant starch is a type of soluble fibre too. It is called resistant because it resists digestion. Depending on how foods are prepared, the amount of resistant starch the food contains changes. The process of cooling or freezing increases the resistant starch some food contains. Resistant starch can help insulin resistance and reduce blood sugar for people with diabetes.
- Insoluble fibre does not absorb water but can stimulate the bowel to secrete more water. This, as well as secreting mucus, helps speed poo along the gut. This type of fibre is found in foods such as wholegrain bread and wholegrain cereals, nuts and seeds, leafy vegetables and potatoes with their skins on. Beans and pulses contain both types.

Even though fibre is now known to be more complex than being soluble or insoluble, it is useful to be aware of them. Soluble and insoluble fibre are often used by health professionals and the public. But as most fibre sources contain both types, there is a move away from using them [1].

Fibre and Our Gut Bacteria (Prebiotics)

Your large bowel is full of bacteria or microbes (the microbiome) - most of them are fussy eaters and will only certain types of fibre. They struggle with insoluble fibre but they are keen on the more soluble types. When soluble fibres reach the bowel, they soak up water, swell up and soften. Bacteria find this irresistible and start to digest the fibre rapidly. The bacteria are also responsible for the gas that is produced in our guts.

But our bacteria pay rent. After they digest our fibre, they produce substances that are beneficial to our gut. These are very small fat molecules

(called short-chain fatty acids) that serve as nourishment for the cells that line our bowel. Bacteria also produce some vitamins. We feed our bacteria and in turn our bacteria feed us.

Interestingly, it seems gut bacteria do more than just produce nutrients. What exactly our gut bacteria get up to is an exciting area of research because it looks like their impact might extend beyond the gut. There is much interest in the fibres that encourage the growth of a more beneficial bacterial population in our gut. Whilst also limiting the growth of less helpful sorts. These fibres, named 'prebiotic', encourage the growth of bacteria with potential health benefits. They are also known as 'probiotic' bacteria. To learn more about our gut bacteria, read the Guts UK leaflet 'The role of gut bacteria in health and disease'.

Why is Fibre Important?

Fibre is vital for gut health and can help to prevent constipation by decreasing the time it takes contents travel through the bowel.

People who consume more fibre are less prone to heart diseases and circulation diseases, type 2 diabetes and colon and rectal cancer (bowel cancer). They have a healthier weight for their height (body mass index) and tend to have lower blood pressure and total cholesterol level. Moreover, people who eat more fibre often have longer lives than those who have less fibre in their diet.

Every extra 7 g of fibre (equal to 2 wholemeal bread slices) in the daily diet reduces the risk of common chronic diseases. For example, an 8% reduction in colon cancer and a 9% reduction in cardiovascular disease and heart attacks. As well as a 7% reduction in strokes and 6% reduction in the incidence of type 2 diabetes.

Having a good intake of fibre benefits the gut microbiome by increasing the amounts of beneficial species. These include lactobacillus and bifidobacteria. Our microbiome is part of us, and we are still learning about the implications of changes to the microbiome in many diseases. It appears that we have a 'gut garden' as part of our personal ecosystem, and it makes sense to feed it well.

How much fibre should we eat?

Many people in the UK don't eat enough fibre. The current advice from the Scientific Advisory Committee on Nutrition is for adults to include at least 30g of fibre in the diet per day. For adults between the ages of 19 and 64 the average intake is 19g per day. It is slightly less for people who are over 65 years of age at 17.5g per day.

So, across the UK population there is a need to increase fibre intake by at least a third – an extra 10g per day. High fibre products have 6g or more fibre per 100g, when you read the food label. When reading labels, a good source of fibre contains between 3g and 6g per 100g of food. Aim for the upper limit.

Children need less fibre than adults. But they are still not getting enough. Unbelievably, 1 in 3 children have constipation.

- 2 to 5 year-olds need about 15g of fibre a day.
- 5 to 11 year-olds need about 20g of fibre per day.
- 11 to 16 year-olds need about 25g of fibre per day.

Please note: when adding fibre to your diet, you may need to add to your fluid / water intake. Fluid is important in moving fibre through the digestive

system and avoiding constipation. For adults, it is generally recommended you drink around 8 to 10 cups/glasses of fluid a day (1.5 to 2 litres).

At Guts UK we're all in favour of prevention. We should consider lifestyle changes before taking laxatives. An increase in dietary fibre means less chance of developing long term conditions too. This is in part due to the micronutrients contained in fruit and vegetables.

HOW TO INCREASE FIBRE FOR PEOPLE *WITHOUT* A GUT CONDITION

Including a variety of different fibre sources in the diet is important.

Fibre Tips

There are ways of increasing how much fibre you eat:

- Consider including a portion of fibre-containing food in each meal and snacks throughout the day.
- Choose wholegrain varieties such as wholemeal pasta, wholegrain bread and brown rice over white bread, pasta and rice.
- Consider incorporating oats into your breakfast, such as porridge, overnight oats and muesli.
- Fruit – aim for 2 to 3 servings per day. For adults, a serving is around a handful or 80g. Fresh, frozen or dried fruit all count. For children, a portion depends on their age. A simple guide for a child is 1 portion of fruit or vegetables is the amount they can fit in the palm of their hand[3].
- Vegetables – aim for 2 to 3 servings per day. For adults, a serving is around a handful or 80g. Fresh, frozen or dried vegetables all count. For children, a portion depends on their age. A simple guide for a child is 1 portion of fruit or vegetables is the amount they can fit in the palm of their hand[4].

- Think about snacking ideas like nuts, vegetables (for example carrot / cucumber sticks) and fresh fruit.
- Try adding lentils and beans, for example chickpeas to meals. 80g is a portion.
- Include a variety of fibre-containing foods in your diet.
- Consider mixed frozen or canned vegetables, or tinned mixed beans to increase the variety, if you have a limited budget.
- Supermarket budget brands all count.

Some examples of higher fibre meals and snacks include:

- Porridge topped with nuts, seeds and fruit.
- Wholegrain toast with banana and peanut butter.
- Lentil curry with brown rice.
- Warm sweet potato salad with quinoa.
- Wholegrain pasta with pesto & chopped vegetables.
- Sliced carrot/cucumber/red pepper with hummus.
- Sliced apple dipped in peanut butter.
- Oven-roasted chickpeas with a sprinkling of cumin.

Don't forget to drink plenty of water, particularly when increasing your fibre intake! Meal Ideas:

Breakfast	Lunch	Dinner
Overnight oats with chia seeds/linseeds and mixed nuts, topped with raspberries 18g	Homemade bean salad 4g	Sweet potato curry with brown rice & wholegrain chapatti 12g (total daily fibre 34g)
Granola, greek yoghurt & pear	Lentil samosa with yoghurt & tomato salad kiwi fruit 8.5g	Tofu & vegetables stir fry with quinoa dried apple snack

9g		12.4g(total daily fibre 29.9g)
Scrambled eggs with spinach on wholegrain toast x 2 slices. 7g	3-Bean & lentil chilli and brown rice fruit salad 13g	Aubergine & courgette wholegrain pasta bake 10g (total daily fibre 30.0g)
Wheat bisks x 2 with milk and a small handful of dried fruit 7g	2 slices of wholemeal bread, hummus topped with sliced tomato and salad medium banana 13.0g	Grilled fish with frozen peas and skin on potatoes. blueberries and yoghurt 10g (total daily fibre 30.0g)
Baked eggs with baked beans and peppers with wholegrain pitta. 14g	Vegetable soup with 2 slices of wholegrain toast topped with cottage cheese apple including skin 8g	Grilled chicken with frozen mixed vegetables and skin on potatoes. 7.5 (total daily fibre 29.5g)

CONSIDERATIONS FOR PEOPLE WHO HAVE MORE COMMON GUT CONDITIONS

As this information shows, fibre can contribute to a long and healthy life and most of us should increase the amount we eat. Yet, people who suffer from digestive diseases sometimes have a tricky relationship with fibre. Some people limit foods high in fibre or avoid particular foods. Many of us play around with our diet to try to manage our symptoms and help us feel better.

However, you should only cut back on foods containing fibre if a certified health professional tells you to do so. They ought to explain how, why and

for how long you need to do this. Generally cutting back on fibre should be for as short a time as possible. But this time will depend on the reason the advice has been given. If it is needed for more than a month or two, the healthcare professional should advise if you need to take a vitamin and mineral supplement. This may be needed to replace the micronutrients from the foods excluded.

Information about the effects of different types of fibre

Insoluble fibre can help with constipation. However, it is important to increase fibre intake slowly and drink plenty of water (this applies to all fibre types). *Insoluble fibre*, however, might worsen diarrhoea by making the bowel secrete more water.

The role of *soluble fibre* in constipation is more complex. Some types might help with constipation, but other types will have little effect, and if consumed more than other fibre sources, could make matters worse. It is also important to note that soluble fibre can produce gas and this might cause discomfort and bloating in some people. On the other hand, soluble fibre can be useful if you have loose poo or diarrhoea, as it absorbs water.

It is not straightforward but, most foods high in fibre tend to contain a mixture of types. Thus, manipulating the type of fibre in your diet is very challenging. Moving away from categorising fibre in this way and considering the diversity of total daily fibre intake is therefore more helpful when considering how to practically change your diet.

There are still many questions when it comes to dose, type and source of fibre in the prevention and treatment of common gut conditions. If you have been diagnosed with a gut condition, then fibre tolerance is likely to be individual depending on the condition or disease and which part of the gut is affected. Because fibre has longer term health benefits, it is important to

include as much variety as you can within any restrictions you have. The following is a list of conditions where people *may* need to modify their fibre intake. **The best way of doing this is to seek advice from a knowledgeable health professional, for example a gastroenterology dietitian.**

Irritable bowel syndrome (IBS).

Gas produced by some fibres could add to symptoms for people with IBS. This is because they may be more sensitive to some fibre types. Wheat bran, a type of insoluble fibre, has been found to make symptoms worse.

Different fibre types may show distinct effects on bowel habits, transit time and the microbiome. This would be according to their characteristics. Therefore, selecting optimal fibres for the treatment of IBS may need to be tailored according to symptoms.

The dietary advice for IBS is a two-step process. For general information, step 1, which does include manipulation of fibre types, there is advice here: Irritable bowel syndrome (IBS) and diet - British Dietetic Association (BDA)..

If this advice is not helping, then ask your doctor for a referral to a dietitian to help you with an elimination diet. One such diet is the Low FODMAP diet, which reduces prebiotic fibre types in the diet to reduce symptoms. It is a learning diet, and it is important to re-introduce tolerated foods for gut health in a systematic way to identify triggers. Ultimately the diet reduces only those prebiotic fibres that are fermented by gut microbes and give people symptoms. As it can be restrictive and might not be suitable for everyone, ask to see a dietitian for help.

Inflammatory bowel disease (IBD)

There is not yet enough evidence to support a high-fibre diet for people with Crohn's disease or ulcerative colitis. However, healthy eating when in

remission for people with IBD is important. But not everyone can achieve that, so it is best to work with a dietitian to understand how to increase the variety in your diet without triggering symptoms. People with gut narrowing (strictures), or ongoing inflammation, which can also narrow the gut, may need a lower fibre diet. If people have continued symptoms, and no inflammation or narrowings in the gut, dietary advice used for IBS treatment might be useful. You may wish to seek support from a gastroenterologist to determine whether you would benefit from IBS advice, if you have IBD with IBS type symptoms. Fibre tolerance may also vary depending on the gut surgery people have had. A dietitian is therefore a crucial part of the team who support people's individual needs with inflammatory bowel disease. Ask your team to refer you to one for help.

Coeliac disease

It is important to follow a healthy balanced gluten free diet. Check gluten free sources of starchy carbohydrates for fibre content. Include a variety of sources of fibre-containing naturally gluten free foods, fruit and vegetables, pulses and plain nuts and seeds. If you continue to have gut symptoms and are struggling, ask your GP for a referral back to a gastroenterologist for investigation. A dietitian can also help to determine and advise about suitable fibre options.

Diverticular disease

Traditionally the cause of diverticular disease was seen as a low fibre diet, which has been challenged recently. A high fibre diet has been sometimes shown to reduce the number of complications linked to this condition[8]. However, there is a lack of robust evidence and a high degree of uncertainty regarding dietary interventions. Healthy eating habits are important for the other benefits that the diet provides. It is best to include

what fibre sources you can tolerate. If you would like some information on healthy eating contact info@gutscharity.org.uk or call 020 7486 0341.

We do know that fibre is important for general good health. So, if more fibre does not worsen your symptoms, then gradually increasing consumption may be worth trying. This should be done, if possible, in consultation with an informed health professional.

The British Dietetic Association and the British Nutrition Foundation have more information on fibre content of common foods.

If you would like information on bloating, wind, IBS, Crohn's disease, ulcerative colitis or heathy eating please contact info@gutscharity.org.uk or call 0207 4860341.