

Nutrition and the Microbiome - What to Recommend?



Information brought to you by Laura Tilt



Gut health is big news, and with diet known to be a key determinant of the microbiome, there's growing consumer interest in how to eat to foster a balanced ecosystem. So, what to recommend?

Defining a Healthy Microbiome

One of the first things to consider regarding eating for a balanced microbiome is that it's still not clear what the 'ideal' microbiome is. Human microbiomes are dynamic - changing with diet, exercise, environment and factors like antibiotic use.

Although personalised microbiome testing has become a popular way of categorising which microbes we're host to, there is still debate around the usefulness of these tests. Whilst stool samples can characterise the microbes present at the end of the digestive tract, they don't represent the whole gut. Another issue is branding microbes as good or bad. This is problematic as a microbe's behaviour can be helpful or harmful depending on what other microbes are around, and in what numbers.

To quote Professor Rob Knight (founding Director of the Center for Microbiome Innovation), "the definition of a healthy gut microbiome may be context-dependent and highly personalised. As a result, we can't define what a healthy microbiome is based on whether specific organisms are present".

That said, one feature which is consistently linked with positive outcomes is diversity - a measure of how many different species there are, and how they are distributed. Because low or narrowing diversity has been linked with several health conditions, foods which promote diversity seem beneficial. So, bearing all this in mind, what can we recommend?

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1. Encourage Plenty of Fibre

Dubbed 'microbiota accessible carbohydrate', fibre is a complex group of plant derived compounds which include resistant starch, lignins, pectins and gums. Unlike other nutrients which are digested and absorbed in the small intestine, fibre travels through the gut relatively unchanged and lands in the large intestine, where it is fermented by the microbes that live there.

This has a number of positive effects: fibre acts as fertiliser for microbes, increasing their numbers and diversity, and the by-products of fibre fermentation (short chain fatty acids or SCFA), maintain the health of the cells lining the gut. The presence of SCFA reduces the pH of the gut too, helping to prevent pathogenic bacteria from colonising. Lastly, high fibre diets increase stool bulk which helps to accelerate transit time - which may help with constipation.

Latest UK guidelines from SACN (the scientific advisory committee on nutrition) suggest that adults should aim for 30 grams of fibre a day, but average intake sits at around 19 grams. Translating the '30 gram' target into practical recommendations (rather than just saying 'eat more fibre') is important as most people aren't familiar with grams or how much fibre different foods contain. Other challenges you might need to overcome in recommending an increase in fibre is the idea that starchy foods are bloating or fattening. Scientists from the British Nutrition Foundation have discussed this, and other practicalities of achieving the 30 gram target in a great paper, which you can read [here](#).

Remember that people with existing gut conditions (like IBS) may need individualised advice from a specialist in regard to fibre intake (more isn't always better!) and always advise a gradual increase to allow the gut time to adjust. online webinars are all ways you can do this.

2. Promote Prebiotics

Prebiotics - not to be mistaken with probiotics - are substrates that are selectively utilised by gut microbes, conferring a health benefit. Most prebiotics are fibres, but not all dietary fibre can be termed prebiotic. This is because many fibres can be fermented (broken down) by all microbes, whereas prebiotics are only fermented by specific beneficial microbes. Additionally, when consumed in large enough quantities, prebiotics stimulate the growth of beneficial bacteria - namely those from the bifidobacteria and lactobaciullis families.

Prebiotics occur naturally in a wide range of foods, including asparagus, onion, garlic, leek, wheat, artichoke, peas, beans and unripe bananas. Experts recommend consuming 3-5 grams a day to confer a health benefit, although this may not be a realistic daily target as the concentration in these foods is not always sufficient to have prebiotic effects. However, these foods are worth promoting as part of an overall strategy to support gut health. For a patient friendly explanation of prebiotic foods, check out the great ISAPP resource [here](#).

Bear in mind that increasing prebiotic intake in people with existing gut conditions like IBS can be problematic, as these foods can be symptom triggers.

3. Be Positive About Plant-Focused Diets

Plant-based eating has surged in popularity in recent years and that's a good thing for gut health as well as planetary health. Self-reported findings from the American Gut Project (a large citizen science research project looking at the population microbiomes) suggest that it's the number of different plant types in a person's diet which has the strongest effect on the diversity of their gut microbiome, rather than whether they identify as being a meat eater, vegan or vegetarian.

In fact, findings from the American Gut Project found that individuals eating 30 different types of plants per week had a more diverse microbiome than those eating ten or fewer. This is a big ask for many people, so rather than getting fixated on 30 a week, we can encourage individuals to include a big variety of fruits, vegetables, pulses, nuts, seeds and grains, rather than always eating the same ones.

4. Consider Adding Some Fermented Foods

Fermented foods are those which are produced or preserved by the controlled action of live microorganisms. They have been dietary staples for cultures across the globe for many thousands of years, and include many familiar foods including coffee, chocolate, wine, sourdough bread and yoghurt as well as sauerkraut, kimchi and kombucha. Interest in these foods has risen in recent years because they are produced with live microbes, and live microbes are good, right?

Not so fast - it's important to address the misconception that fermented foods are the same thing as probiotics. Probiotics are live microorganisms, which deliver a health benefit when consumed in large enough amounts. Not all fermented foods contain live microbes as many are pasteurised, baked, smoked or filtered before reaching our plates - examples include sourdough bread and pasteurised sauerkraut. Even if they do contain live microbes, we can't be sure they are in large enough amounts to be termed probiotic. That said, humans have safely consumed fermented foods for thousands of years, and there are benefits beyond the microbes - from the fibre in fermented veggies, to the breakdown of lactose in kefir, which often makes it suitable for people with lactose intolerance. For more patient friendly information check the ISAPP resource on probiotics [here](#).

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Is this advice right for everyone?

Although these recommendations have been linked with positive outcomes for the gut microbiome, it's unlikely they'll have the same effect on everyone. Studies show that similar foods have different effects depending on an individual's current microbiome, and the outcomes aren't always as expected. But, with more research, we might soon be able to predict who will respond best to interventions such as high fibre diets. Interestingly, this type of personalised nutrition may be closer than we think - [Zoe](#) is a nutritional science company who are currently researching how metabolic responses to food can be predicted using an individual's genes and microbiome. Zoe is currently undergoing trials across the U.S. with promising results - so watch this space.

References

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