

THE BEAUTY OF BACTERIA

Around the world, people are flocking to the billion-dollar probiotics industry to feed their body's good bugs and boost their 'microbiome'. Turns out, the key to a healthy gut may be simpler than you think

BY HANNA MARTON

Right now, the gut is big business. In fact, the global probiotics market was valued at more than \$83 billion in 2022, while the hashtag #guthealth has clocked over three billion views on TikTok. It's no secret we're obsessed with our digestive regions. According to the CSIRO, at least half of Australians suffer gut symptoms such as bloating, gas and constipation. But there's more to poor gut health than farts that clear a room.

The gut (large intestine) is, after all, home to trillions of live microorganisms, or 'microbiota' – mostly bacteria but also things like viruses and fungi. It sounds ominous but microbiota is largely good, helping you to break down food and synthesise nutrients, bolster the immune system and perform other important bodily functions.

In a healthy gut, helpful microbiota live in perfect harmony with potentially harmful microbiota. Imagine a thriving commune of peace-loving bugs putting their differences aside to ensure you, their host, live your best life. This digestive 'ecosystem' is called the microbiome and like your fingerprint, your microbiome is unique.

If this balance of 'good and evil' microbiota is tipped however, and harmful microbiota are allowed to flourish, things can go pear-shaped. And not just in the gut itself.

"It took us ages to realise that these trillions of organisms are not just inert things in the gut, but they're fundamentally integrated with all of our pathways," says Professor Emad El-Omar, gastroenterologist and director of the UNSW Microbiome Research Centre. "Microbiota

produce chemicals called metabolites that impact your systems. Metabolites are relevant to metabolism, impacting weight, as well as our immune system and ability to fight off infections, for example." Because metabolites can enter nerves lining the intestinal wall, which send messages to the brain, they even affect your mental wellbeing.

In turn, a healthy microbiome can help prevent chronic diseases such as cardiovascular disease, obesity, Type 2 diabetes and cancer. "Learning that these trillions of microorganisms are integral to overall health and disease risk is probably the most exciting thing that's happened in nutrition in the past 20 years," remarks Nicole Dynan, accredited practising dietitian and founder of Sydney group practice, The Gut Health Dietitian. "It might give us answers to health woes that we haven't been able to uncover."

Just as the microbiome takes care of us, we need to take care of it. It's sensitive to diet, environment, exercise and medication. Because your microbiome develops in the first couple of years of life, even being born vaginally (picking up bugs on the way out) will impact its composition. Not that there's anything you can do about that now. Or is there?

Enter probiotic products. Packaged powders, gelatine capsules and dairy products containing 'live' bacteria (probiotics), which claim to improve gut health, are flying off shelves around the world. But do they work?

"For most of them, we don't know whether those live strains survive the stomach acid in order to benefit us," says Dynan. While not harmful, El-Omar says

5 WAYS TO FEED YOUR MICROBIOME

ADOPT A PET Multiple studies show kids who grow up with dogs and cats tend to have a more diverse microbiome since our furry friends track more bugs into the home. (Unsurprisingly, dogs deposit double the bacteria of our feline pals.) Researchers at the University of Arizona are currently working on a study of the elderly to see how living with a dog changes their skin and gut microbiomes.

GET MORE FIBRE-RICH WHOLE FRUITS AND VEGETABLES Microbiota break down fibre to downgrade inflammation and enhance your immune system. Aim for 28g of fibre for women and 38g for men per day. High-fibre foods are more filling, too.

REDUCE YOUR RED MEAT INTAKE The digestion of red meat, particularly in the presence of nasty bugs, generates metabolites that are harmful to the cardiovascular system. "I'm not alarmist. I'm not saying, 'Go vegetarian,' but having steak every night or a Big Mac a few times a week isn't good," says El-Omar.

INCLUDE NATURALLY FERMENTED FOODS IN YOUR DIET Swap out store-bought probiotic supplements for kimchi, sauerkraut or kefir, which contain live bacteria that could benefit your microbiome.

BREASTFEED IF YOU CAN Breast milk and a mother's skin is teeming with helpful probiotics that boost the diversity of a baby's microbiome. Thinking of starting a family? The UNSW Microbiome Research Centre is recruiting people planning a pregnancy for The MothersBabies Study, a world-first pre-pregnancy analysis looking at how the microbiome changes from preconception until the baby's first birthday. For details, visit microbiome.org.au

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shelf-based probiotics aren't typically tested in large clinical trials because they're sold as food supplements, not medicines. According to the Therapeutic Goods Administration, a probiotic doesn't need to be regulated as a therapeutic product unless it claims to improve your health. It's otherwise covered by the food standard. "The companies only need to prove that the product isn't going to kill you," says El-Omar.

Even the long-held belief that popping probiotics after a course of antibiotics will help your gut recover might be moot. In an Israeli study, probiotics actually delayed the recovery of the microbiome post-antibiotics.

"I would rather have natural probiotics in my healthy diet instead of spending a fortune on something that looks convenient and convincing, when I have no idea whether they actually work or not," says El-Omar. That said, next-generation probiotics are now being tested in various clinical trials, so a microbiome-boosting pill that delivers may not be far away.

The key to a happy microbiome might be deceptively simple: feed it a healthy diet rich in prebiotics – types of plant fibre that help good bacteria flourish. Prebiotics are found in fruit and vegetables, especially those containing complex carbohydrates. In other words, prebiotics are food for probiotics (the live bacteria).

And think 'assortment'. "What you want to see in the microbiome of a stool sample is diversity: a variety of different types of bug interacting with each other," explains El-Omar. No one knows for sure, but there



PROFESSOR EMAD EL-OMAR

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are hundreds, possibly thousands, of microbiota species. "With diversity you get strength and resilience, because all these bugs have different skills. For example, you want bugs that generate your vitamins, those that generate your feel-good neurotransmitters, and so on."

Your diet should be equally diverse, since the microbiota are fussy eaters. "If you just eat broccoli, you're only feeding the bacteria that prefer broccoli and the bacteria that prefer cauliflower, beans or carrot starve. You can feed a greater range of good bacteria in the gut with more variety," says Dynan. She espouses the Mediterranean diet, rich in fruit, vegetables, legumes, wholegrains, nuts, seeds, good fats, oily fish and yoghurt. A study published in the *Nature* journal indeed linked this diet with a more diverse microbiome.

Likewise, El-Omar suggests eating more plants, avoiding smoking and excessive alcohol, cutting back on red meat and eschewing a high-fat diet. Combine this with physical activity, which allows healthy microbiota to flourish, preventing inflammation. "Nasty bugs can tolerate inflammation better than healthy bugs. You don't have to run marathons, just don't be sedentary," he advises.

So how do you know if your microbiome isn't thriving? "You might be fatigued or low in energy, or experience bloating, diarrhoea, heartburn or reflux, for example," says Dynan. See your GP to rule out any medical concerns. Feeling well? You can still optimise your gut health. "You could potentially reduce your risk of disease in the future."

Just by following a healthy diet? We can do that.