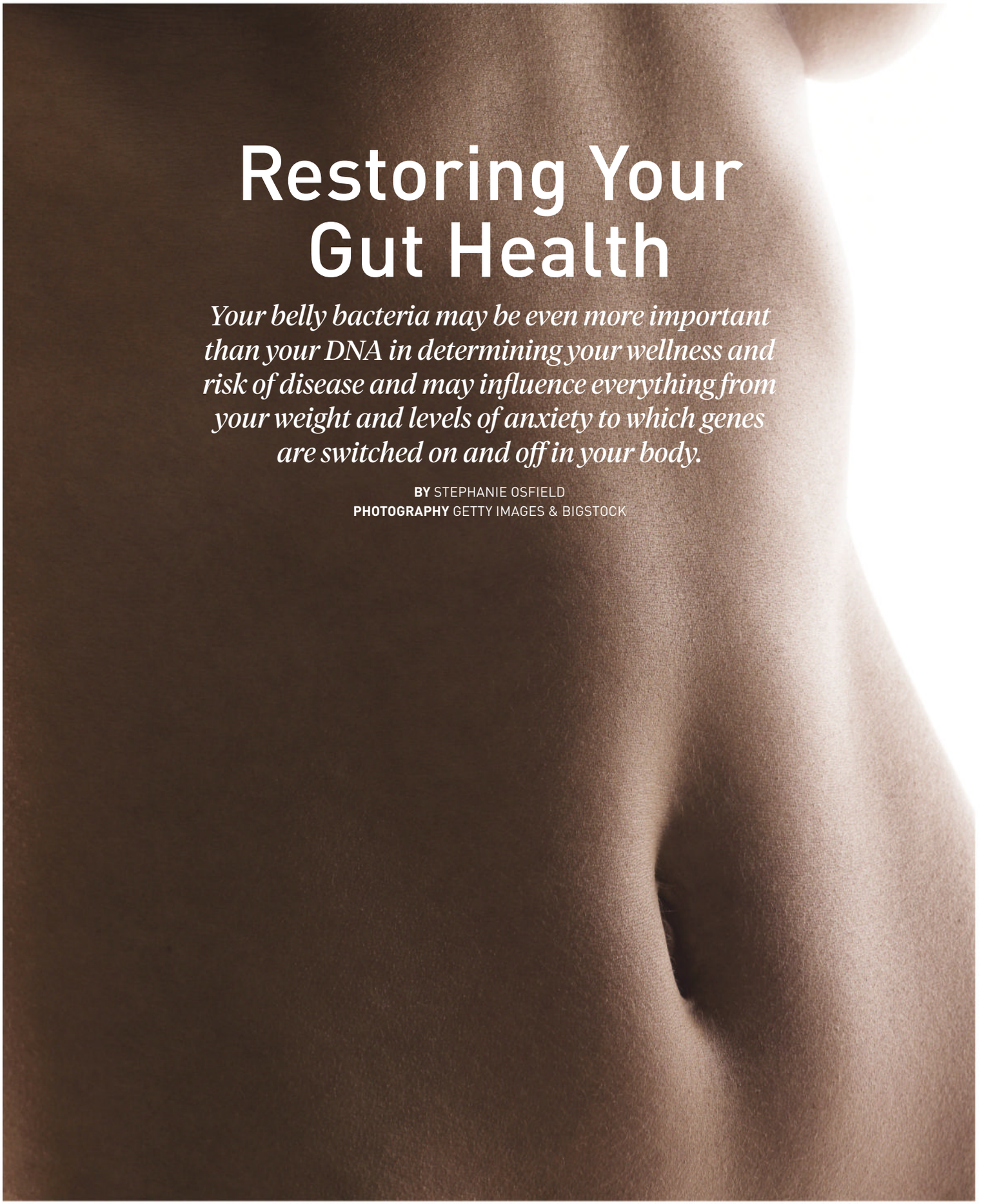
Restoring Your Gut Health

Your belly bacteria may be even more important than your DNA in determining your wellness and risk of disease and may influence everything from your weight and levels of anxiety to which genes are switched on and off in your body.

BY STEPHANIE OSFIELD
PHOTOGRAPHY GETTY IMAGES & BIGSTOCK



FOR MORE MAGS

HTTPS://T.ME/IWANTMOREMAGZ

FOR MORE MAGS

HTTPS://T.ME/IWANTMOREMAGZ



Breastmilk passes important bacteria to babies.

Your belly is like a constantly evolving garden that may change through different seasons of your life. When it is thriving, you also thrive. When the wrong kind of bacteria, like weeds, take root and dominate, your health suffers. Hippocrates once said that all diseases begin in the gut. Now science is proving he may have been right. As research unravels the mysteries of the workings of bacteria in your belly, the gut microbiome (the population of bacteria that have set up house within your body) is fast emerging as one of the most important and influential determinants of homeostasis.

Fifty years ago, your individual genetic makeup was regarded as the pivotal influence on your health. Now, many experts are acknowledging the equal importance of the chemicals produced by various strains of bacteria. As a result, they are considering the powerful influence of bacterial DNA, which may even determine what in your DNA is switched on and off in your body.

This growing understanding of the influence of bacteria is one of the biggest scientific breakthroughs of our age. It may provide an important missing link explaining how all manner of conditions, from heart disease and diabetes to cancer and autoimmune illnesses, may be both triggered and treated.

In addition, research is revealing that bacteria may release chemicals and signals that influence your emotional and mental health, potentially kickstarting everything from anxiety and depression to dementia, obsessive-compulsive disorder and conditions such as ADHD or Asperger's (research, including work by the University of Arizona in the US, has found that children with autism have significantly lower levels of gut microbes).

As we learn more about specific benefits



of some bacteria and understand how different bacteria influence each other, it may be possible to single out certain strains to help treat, and protect against, disease. In the future, having stool and blood tests to determine your microbiome profile may become as routine as blood tests to determine levels of cholesterol or iron or important hormones. Where deficits are found, specific and targeted microbiota may be prescribed to treat all manner of health conditions, from obesity to psoriasis.

More tailored probiotic formulas may also be used to target specific ailments. The formula may differ according to your cultural background, which also influences your bacteria profile. In Japan, for example, people contain higher numbers of bacteria that help them digest seaweed. In Africa, children whose diets include a grass called sorghum carry bacteria that help them digest cellulose, while the Hazda tribe has healthy bacteria strains that have not been found in the bellies of Westerners.

Your body carries an estimated 10 times as many microbial cells as human cells and collectively they weigh as much as the human brain.

You are your bacteria

Each person supports some 100 trillion types of different bacteria, according to the findings of comprehensive research called the Human Microbiome Project, conducted by America's National Institutes of Health. These bacteria are so prevalent that your body carries an estimated 10 times as many microbial cells as human cells and collectively they weigh as much as the human brain. Essentially, this means that for every cell of "you" there are 10 times that number of bacteria cells — so their influence should not be understated.

Bacteria reside in areas like your mouth, skin, vagina, urinary tract and intestines,



but most set up house in your gut or large bowel. Collectively, they are known as your "microbiome", and the composition of your microbiome is influenced by bacteria you acquired from your mother, as well as via health issues like tummy bugs and as a result of your lifestyle. From the moment you are born, you collect bacteria from all walks of life: from other people, pets, nature, food, the air you breathe, the surfaces you touch and even the furniture you sit on.

At any one time, you may carry as many as 10,000 different strains of bacteria in your body. The helpful bacteria are responsible for a number of metabolic processes that are not activated by your genes but are critical to life. They help you digest and break down your food, absorb and utilise nutrients and they line your digestive system, providing a frontline of defence against dangerous bacteria that could cause illness or disease.

A healthy gut microflora may also have less well-known impacts, such as helping to neutralise the phytic acid from foods like grains and nuts and converting it to inositol, allowing better absorption of calming minerals such as zinc and magnesium. However, if large numbers of unhealthy bacteria have taken over in your belly they can upset the balance in your body, causing everything from bloating and skin rashes to inflammation and disease. When this occurs, the populations of bacteria that are important for your nutrient metabolism, immune response and energy are crowded out and their numbers diminish.

Body & brain control

The far-reaching influences of bacteria are still being mapped and continue to astound the scientific community. For example, specific bacteria have been noted in the saliva of people who have developed diseases of the pancreas, while people with type 2 diabetes show differences in their gut bacteria and have lower levels of bacteria known to produce butyrate, a fatty acid with beneficial effects. In the future, screening for these kinds of bacteria could allow early intervention in people at risk of disease.

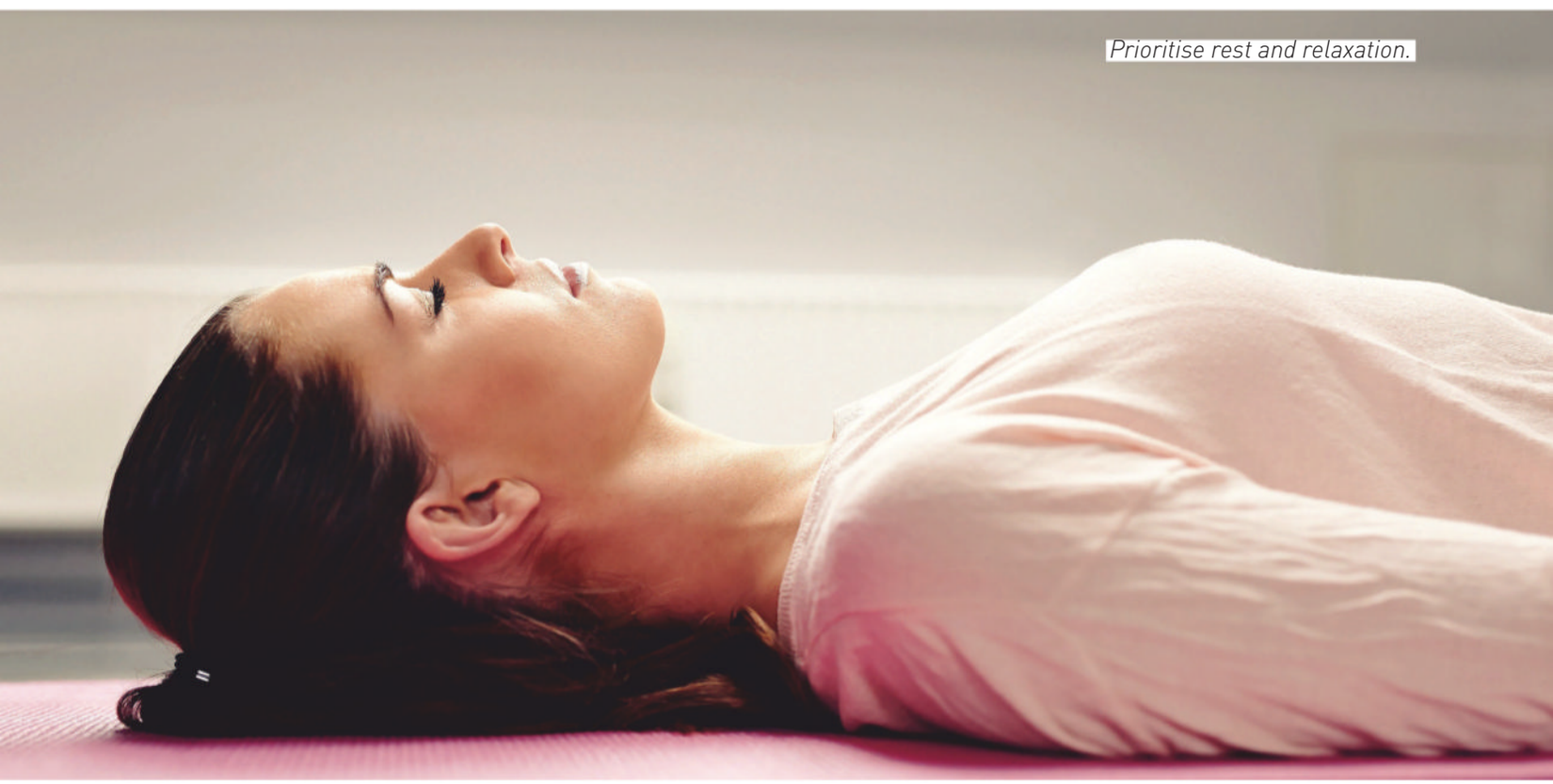
It has long been known that people with bacteria that cause gum disease have higher risk of heart disease. Now studies are showing

clear and strong links between gut bacteria, strokes and heart attacks. Even a seemingly unrelated condition such as incontinence may be linked to bacteria. Research at the Loyola University Chicago Stritch School of Medicine in the US has found that the bacteria present in the bladders of women with incontinence are very different from the bacteria found in women who do not suffer issues of bladder control or leakage. In addition, improving the bacteria balance in the vaginas of post-menopausal women may also help prevent dryness and reduce pain during sex, according to research by Johns Hopkins in the US.

Bacteria therapy is now being trialled as a cancer treatment and the results are very promising. Research reported in the *Science Translational Medicine Journal* showed the injection of a bacterium called *Clostridium novyi* directly into tumours in dogs helped to shrink or completely eradicate the tumours. This led to a human study, where the clostridium bacterium was injected into tumours in the liver, lungs and shoulder soft tissue of a 53-year-old woman. Within a month, her tumours had not only begun to shrink but a clear border had formed around the cancers and, beyond that, the tissue in the area was healthy and well supplied with oxygen. If bacteria are being explored as a potentially effective treatment for cancer, it's only logical that ensuring you have a healthy microbiome may also be protective against developing cancer.

Helpful bacteria are responsible for a number of metabolic processes that are not activated by your genes but are critical to life.

In your gut, bacteria make chemicals, including dopamine and serotonin, which are also produced in the brain and are linked to mood. So their influence over these neurotransmitters, and also over hormones that may alter brain function, may give them a great deal of power over your emotional state.



Prioritise rest and relaxation.



Bacteria imbalance is now being implicated in the epidemic of depression and anxiety sweeping the globe. Probiotics to balance the gut microflora are now being studied as a potential alternative to antidepressant drugs.

In studies at the University of California in the US, for example, scientists have found that connections between different regions of the brain differ according to a person's belly bacteria. When the researchers did an additional study giving women aged 18–55 two daily doses of probiotics, their anxiety levels were substantially reduced compared with women who took a placebo. French research has also shown that, in only 30 days, probiotic supplements containing *Lactobacillus helveticus* and *Bifidobacterium longum* reduced both anxiety and depression in participants.

Battle of the belly bugs

Your belly is not simply an incredibly complex ecosystem that supports countless different species of bacteria; it's also a biological battleground. In different areas of your digestive system, different species battle it out for supremacy and, increasingly, the less healthy microbes are winning. Processed food, too little sleep and insufficient exercise are all contributors. The rise of chemicals in your food, water, environment and the air you breathe is also an important factor in the growth of unhelpful bacterial populations, as these chemicals are absorbed through your skin and by inhalation and digestion. In addition, the way we give birth and feed our babies is reducing helpful bacteria in the human body.

Breastmilk passes important bacteria to babies that not only boost their immunity and brain function but may also explain why breastfed babies have a lower incidence of obesity, allergies, diabetes and some bowel conditions later in life. Birth by Caesarean section is also having a profound impact on the microbiome of babies. As babies pass down the birth canal, many different species of bacteria are transferred from mother to child. With the

Superfoods for beneficial bacteria

Want to boost your good beneficial bacteria through food? Eat more of the following:

- **Berries.** Phenolic compounds found in blueberries and strawberries can boost good bacteria, helping to reduce inflammation. Cranberries are particularly beneficial: they increase levels of the bacterium *Akkermansia muciniphila*, which aids weight loss. Canadian research from the University of Laval has shown that men given one cup of cranberry juice a day lost weight without any other lifestyle changes.
- **Greek yoghurt.** This is high in active bacteria such as *Lactobacillus bulgaricus* and *Streptococcus thermophilus*, which survive well in your digestive tract. Make sure you choose the real deal, which contains milk and cultures but no flavours or sweeteners.
- **Garlic.** This contains sulphides, which help it act as a natural antibacterial agent against bad bacteria strains.
- **Sourdough bread.** As this uses fermenting agents for the bread to rise, it's a great way to add bacteria like lactobacillus to your food intake.
- **Kimchi.** This traditional Korean dish of fermented vegetables such as cabbage and radish contains lactobacillus strains and other types of helpful bacteria.
- **Sauerkraut.** This cabbage dish boasts high levels of *Lactobacillus plantarum*, a bacterium that can help reduce yeast infections and improve digestion.
- **Asparagus and artichokes (Jerusalem).** They are both rich in inulin, a prebiotic that helps you better absorb vitamins and other nutrients.
- **Apples.** Japanese research has shown that eating apples daily helps increase beneficial forms of belly bacteria, including bifidobacterium and lactobacillus strains.
- **Miso.** This paste made from fermented soybean is high in lactic acid and lactobacillus strains and has a low pH so is able to effectively transport this bacterium though your digestive tract.
- **Pineapple.** This fruit contains bromelain, an important digestive enzyme that helps you better digest and absorb food. Research from the University of Maryland in the US suggests bromelain may help combat unhealthy bacteria, reducing gastrointestinal complaints and diarrhoea.
- **Radishes and carrots.** These bright vegetables both contain a natural type of fibre called arabinogalactan, which helps the good bacteria in your gut to thrive.
- **Kombucha.** As this fermented tea drink is naturally fizzy, it's a refreshing alternative to unhealthy carbonated soft drinks and boosts both bacteria and B-group vitamins. It's not difficult to culture at home.

increase in Caesarean delivery, more children are being born without these bacteria and studies are now emerging that suggest this microbial deficit may be a major contributing cause of the rise in allergic issues in children such as eczema, asthma, food sensitivities and allergy, including peanut anaphylaxis.

Lifestyle factors such as drinking too much alcohol, smoking, eating a lot of processed foods, being dehydrated and consuming foods you are sensitive to (such as gluten) can also make an enormous difference to the strains of bacteria that prosper or struggle in your body. Your microbial balance can easily shift to one that's less healthy after a short period of neglecting your health for several weeks or months. If your life becomes unbalanced due to chronic stress, too little sleep or not enough downtime, unhealthy bacteria will thrive, crowding out the more beneficial microbes.

Scientists believe the overuse of antibiotics (which blitz all the bacteria in the body, good and bad) has been a key factor in reducing populations of helpful bacteria while allowing less beneficial bacteria to dominate. Avoiding antibiotics unless absolutely necessary is critical to maintaining a healthy bacterial balance. Some scientists also theorise that, via the reduction of good bacteria, antibiotics are responsible for the global rise in asthma rates and this can be mapped in the stats showing an asthma spike since the end of World War



Studies have shown that probiotic supplements can assist your body to combat a range of conditions.

II, when antibiotics were introduced. Though antibiotics may be necessary to save lives in some serious circumstances, their overuse — not just in medicine but also in agriculture (for example, in chickens and cattle and some bee populations) — may be causing life-altering changes to bacteria and so compromising our health. If not corrected, these changes can then lead to other illnesses.

Though improving your gut microflora takes time, it's a worthwhile investment in your current health and future longevity. By addressing day-to-day lifestyle issues so you are eating nutritionally dense foods and ensuring you prioritise rest and relaxation, your good belly bacteria will enjoy a boost and benefit your immunity and emotional and physical health.

People who have a very limited number of belly bacteria are more likely to be overweight or obese.

The big bacteria picture

Research involving bacteria was initially focused on their impact on digestive issues such as irritable bowel syndrome or Crohn's disease (caused by chronic inflammation of the bowel). However, as the belly is connected to the endocrine (hormone) and immune systems, researchers are now starting to turn their attention to those. It is now widely accepted by many scientists that there's a link between bacteria and almost every ailment in the body. The individual makeup of bacteria may explain why some people struggle to lose weight while others stay thin, or some individuals succumb to disease or metabolic conditions while the hormonal balance of other individuals remains more stable and healthful.

Though our growing knowledge about bacteria is only the tip of the iceberg, what is very clear is that healthier people have a different microbiome makeup from people who suffer from disease or chronic health issues. For example, research shows that people who develop the autoimmune disease

rheumatoid arthritis have higher levels of a bacterium in their intestines that elevates levels of inflammation. By releasing unhealthy chemicals and making the body environment less able to support healthier microbes, the bacterial "baddies" increase inflammation, which is regarded as a triggering factor in most diseases.

While there can be a domino effect where poor lifestyle causes unhealthy bacteria (that in turn can lead to chronic health niggles or disease), on the flipside, chronic health conditions and disease can also cause a change in the body's levels of bacteria, setting the stage for complications or other conditions. One obvious barometer of this is belly health. The past 50 years have seen a rapid increase in the number of people with digestive issues such as irritable bowel syndrome (IBS), Crohn's disease, ulcerative colitis, gastroesophageal reflux disease (GERD) and more day-to-day digestive complaints, including constipation, diarrhoea, bloating and nausea. Belly bacteria may well explain this increase.

However, it's not just about having abundant colonies of good bacterial strains that better support your immune system and health. Supporting a wide diversity of bacteria in your

Probiotic power

Probiotics are live organisms, such as bacteria and yeast, which can boost health by improving the mix of bacteria in your body so the good strains thrive. To maximise the benefits of probiotics, it's important to understand:

- Their health benefits. Studies have shown that probiotic supplements can assist your body to combat a range of conditions, including thrush, eczema and urinary infections, and reduce the severity of colds and flu and digestive issues. They have shown the biggest promise in helping treat some stomach bugs and digestive/bowel issues, including diarrhoea caused by antibiotics or the rotavirus, travel diarrhoea, ulcerative colitis and irritable bowel. Always take them when travelling.
- Strain-specific differences. Most probiotics utilise two strains of good bacteria, lactobacillus and bifidobacterium, as these have been found to most effectively survive the passage through the digestive system. Probiotics also have many sub-strains with differing bacterial properties: for example Lactobacillus acidophilus, which is found in yoghurt and may help reduce acidic stomach pain. But, when it comes to their benefits, probiotics are not one size fits all. So, before using them, it's helpful to talk to a health professional to find the best choice to suit your health aim. For example, for digestive issues, strains like Bifidobacterium infantis may offer most benefit. For thrush or candida issues, use Lactobacillus rhamnosus and Lactobacillus acidophilus. And if you want to protect yourself against the cold virus over winter, choose Lactobacillus fermentum.
- Their fragility. Probiotic supplements come in powder or tablet form with differing strengths and amounts of good bacteria. As they are fragile and sensitive to heat, most preparations need to be transported in a cold pack and stored in the fridge.
- Dose and choice recommendations. The standard dose advised by most experts is about 10 billion colony-forming units daily. However, you may want to start with a small dose and work up to the higher one, as the die-off of bad bacteria can initially lead to side-effects like bloating. As probiotics can be harmful in some health conditions (for example, if you have a chronic health condition that compromises your immunity), it's a good idea to consult a health professional before you start taking them.
- Their limitations. Though probiotics can help shift your bacteria balance, this improvement may not be sustained if you cease to take probiotics. However, in the future, the power of probiotics may be further enhanced. Scientists at the UK's Norwich BioScience Institutes have developed a crystallised protein from a probiotic strain called Lactobacillus reuteri that may help gut bacteria bind to the gastrointestinal tract. This protein may be added to different strains of probiotics to ensure that those strains really take root in the gut so they remain there to maximise their health benefits.



Aim every day to eat fruit, vegetables and legumes of different flavours, textures and colours.

body has been shown to be equally important. People who enjoy a greater number of different bacterial strains in their bodies (and bellies) also tend to enjoy greater health and suffer less disease. Obviously, this variety of bacteria is less likely to flourish if you are eating a diet high in processed, low-fibre foods, fat, sugar, salt and preservatives. Therefore, making dietary changes is an obvious and powerful way to improve your microbial profile.

Feeding the right bacteria

Coeliac disease and non-coeliac gluten sensitivity can lead to greater levels of unhealthy bacteria in the belly. In people who react to gluten or lactose, these foods can feed unhealthy bacteria in the intestines, causing gas, bloating and discomfort as well as upsetting the absorption of nutrients. So, if you suspect you may be sensitive to any food, it's well worth doing an elimination diet whereby you remove the suspect food for several months. When you reintroduce it, look for signs of sensitivity that may occur within hours or days of consumption, including skin rashes, gastrointestinal disturbances, nausea, headaches and extreme lethargy.

Your overall diet composition is also pivotal. Recent research from the Cleveland Clinic in the US has found that cholesterol and saturated fat in red meat may not be the main reason protein foods like beef and lamb are linked to conditions like heart disease and cancer. A potentially potent contributor could be a little-studied chemical called TMAO (trimethylamine N-oxide), which bacteria produce after they feed on carnitine in red meat. Vegetarians have much lower levels of TMAO, while meat eaters have much higher levels and those higher levels are now being found in people who suffer stroke and heart disease. So if you have been serving up red meat repeatedly on a paleo eating plan, you may want to consider cutting back or introducing some meat-free days every week.

Following a vegetarian diet or substantially increasing your intake of fresh fruit and vegetables is one of the most rapid, simple and effective ways to completely make over your bacteria so you enjoy a healthier microbiome. Harvard University research has clearly shown that potentially problematic bacteria can enjoy a sudden population growth after just two days of eating an animal-based diet of meat and dairy foods, including bacon, ribs and cheese. These changes to the bacterial makeup of the participants were



observed in as little as a few hours.

The study also found that the bacteria induced by a high meat and dairy diet helped a range of problematic microbes to prosper, including fungi and viruses. Some microorganisms that can trigger chronic digestive conditions also started to dominate the body's bacterial ecosystem. In particular, the meat eaters experienced a significant increase in *Bilophila wadsworthia*, a bacterium that's a known contributor to conditions like inflammatory bowel disease and colitis. By contrast, when those who had eaten this high-meat, high-dairy diet undertook a vegetarian eating plan, the levels of good bacteria in their guts rapidly improved and the unhealthy bacteria started to quickly decrease.

Controlling your cravings

Did you know that the bacteria in your gut might influence the food you crave? Research has found that different types of bacteria can act like little divas in your body, demanding the kind of foods they want. Unhealthy bacteria appear to make louder and unhealthier demands than healthy bacteria. If they take up more real estate in your digestive system, the unhealthy bacteria may make you desire unhealthy foods like sugar and unhealthy fats, which can contribute to weight gain and nutritional deficiency.

This may explain why studies show that people who often experience a desire to eat chocolate show very different bacteria metabolites in their urine samples than people who don't experience recurring urges for a chocolate fix. In short, bacteria can boss your brain signals around to ensure you eat more of the food they feed on so they benefit and multiply. The bacteria may be influencing your palate via different bodily systems. First, they may change the function of your taste receptors so some foods are more appealing; they may send signals to your brain when they're hungry so your brain sends out more hunger-boosting hormones; and they may also send signals to your brain via the vagus nerve, which runs all the way from the gut to the brain.

This impact on the vagus nerve was confirmed in a recent meta-analysis of 120 different studies that involved both the University of Mexico and Arizona State University in the US. "Microbes have the capacity to manipulate behaviour and mood through altering the neural signals in the vagus nerve, changing taste receptors, producing toxins that make us feel bad and releasing chemical rewards that make us feel good," said

senior author of the study Athena Aktipis in a statement about the scientific overview.

Widening your waistline

When given to mice, antibiotics that are commonly administered to children to treat ear infections can induce weight gain despite no change in their diets. A change in their belly bacteria is the most likely culprit. The antibiotic theory may explain the rise of the equally concerning obesity epidemic in human beings.

The wrong mix of bacteria can set the stage for weight gain and diseases linked to unhealthy hormone balance. Researchers from the University of Maryland have identified 26 different bacteria in the gut that appear to be linked to metabolic syndrome — a combination of factors including weight gain around the midriff and elevated insulin and cholesterol levels, which predisposes people to cardiovascular disease and diabetes. According to a statement by the authors of the study, which was published in the online journal *PLOS*, "The gut microbiota has been

Bacteria transplant

While probiotic supplements can certainly help improve the bacteria balance in the belly, some health professionals believe they are not capable of implanting good bacteria permanently into the gut's ecosystem. Enter faecal microbiota transplantation (FMT), which transplants faecal matter from a person with a healthy bacterial profile into the gastrointestinal tract of a person with unhealthy bacterial populations. In essence, the bacteria act like a natural antibiotic to kill off unhealthy bacteria. At the same time, they allow healthy bacteria populations to thrive and also introduce species of bacteria that may have been reduced or eradicated due to health issues like tummy bugs and antibiotics use.

Though the therapy is still fairly new — and very expensive — studies are already showing that it can be a highly effective form of treatment for gastrointestinal disorders including irritable bowel syndrome (IBS), constipation and inflammatory bowel disease. One study showed FMT led to a 91 per cent cure rate of infection by *Clostridium difficile* bacteria, which causes diarrhoea and is a known cause of colitis. Within three days, 74 per cent of patients reported a full resolution of their diarrhoea symptoms. These successes are starting to cause scientists to look at much wider health applications for microbiota transplants, which in the future may be used to treat everything from diabetes and obesity to non-alcoholic fatty liver disease.

The FMT process involves the use of human flora from a donor with a very healthy and robust bacterial balance. Before the procedure, antibiotics are prescribed to the bacteria recipient to kill off as much bad bacteria as possible and their bowel is also prepared using colonic irrigation. For five to seven consecutive days (sometimes more), the samples of good bacteria are then delivered to the bowel of the patient using one of several different techniques:

- **An enema.** The healthy bacteria sample is mixed with a saline solution and gently irrigated/washed into the bowel via a small tube that is inserted into the rectum.
- **A colonoscopy.** The bowel is cleared using preparations as with a normal colonoscopy and then, under a light anaesthetic, instruments are used to deliver the bacteria deep into the wall of the bowel or lower small bowel.
- **Nasojejunal tube.** After light sedation, a tube is placed through the nose and an endoscope (a long thin tube with a light and small camera) is used to guide it into the small bowel and the bacteria is then gently washed through to that area in a saline solution. This method ensures that healthy bacteria is delivered to the mid small bowel area.

Some practitioners will use a range of these techniques to deliver bacteria to different areas of the gut. Though donors can be selected from donor banks, patients can also nominate a donor of their choice, such as a family or friend. Before the transplant, the donor and their samples are screened for stool pathogens and also more generally for parasites, bacterial and viral infections and infectious diseases including HIV, all strains of hepatitis and conditions such as toxoplasmosis.

implicated in obesity, perhaps by influencing energy homeostasis, host signalling, insulin resistance, gut permeability, inflammation and the innate immune response."

In the future, people who want to lose or maintain their weight may be encouraged to follow diets to improve good bacteria and blitz the bad, because in order to commit wholeheartedly to a healthy eating plan you may actually need to change your belly bacteria first. In one study conducted at Washington University, bacteria from obese mice were taken and transplanted into mice of normal weight and these mice then rapidly started to gain weight. On the flipside, when bacteria was taken from thin mice and transplanted into the overweight mice, the mice with the muffin tops shed weight and stayed thin, despite no changes in their diets or levels of exercise.

Research shows that people who have a very limited number of belly bacteria are more likely to be overweight or obese. Enjoying a wide range of bacteria in your gut appears to be pivotal to having a healthy body mass index and showing a healthy weight on the scales. Danish research involving people both of a healthy weight and obese has found that those with a lower level of genetic diversity in their bacterial populations also showed higher levels of inflammation markers in their blood, along with insulin resistance and other signs of metabolic syndrome, or Syndrome X. Those people who had limited bacterial strains and were overweight also continued to gain significantly more weight over the next decade than those who had more varieties of bacteria in their bodies.

Given the enormous impact that diet clearly exerts over belly bacteria, eating a wide range of different foods is an obvious effective and completely natural way to improve the ratio of good to bad bacteria in your body. The trick is to both eat a variety of food groups and also mix it up within those good groups. Aim every day to eat fruit, vegetables and legumes of different flavours, textures and colours and a wide range of grains (rice, buckwheat, rye, quinoa, barley, amaranth) along with a wide range of dairy and milk products (eg goat, rice, soy). Remember to also vary your choices of beverages, like tea (green, herbal, Japanese etc), and herbs.

Consuming fermented foods daily, such as kefir and kimchi, may be extremely beneficial in helping to grow your healthy bacterial populations. Fermented foods provide natural antibiotic actions and helpful enzymes that



Traditional kimchi



improve digestive health to help increase absorption of nutrients such as vitamins. If you don't have the time to ferment foods at home, watch that the varieties you buy do not contain unhelpful added ingredients such as sugar, salt and preservatives or flavours. Also make sure fermented foods like sauerkraut and pickles haven't been pasteurised as this process kills the health-giving organisms in them.

Bacterial balance

Good bacteria contribute to a "normal flora" in the body where the number of health-giving bacteria outweighs the number of bad bacteria and this supports and stimulates your immune system. Though your body tries to default to this normal flora, insults such as a diet too high in sugar/unrefined carbohydrates, or weeks spent suffering a recalcitrant stomach bug, can alter the balance permanently.

Yet, though we used to think of unhealthy bacteria as the enemy, some studies are showing that even the "baddies" may sometimes work in your favour. *E. coli* is a case in point. This rod-shaped bacterium is associated with gastroenteritis, urinary tract infections and septicaemia, yet you carry it around in your belly all of the time and evidence suggests it may actually help your gut synthesise vitamin K, a vital nutrient that helps your blood to clot and builds strong bones. However, as in all things, balance is the key. Although a little *E. coli* might be helpful, too much of it can quickly cause health complications. Similarly, *Helicobacter pylori*, which in excess can cause stomach ulcers and stomach cancer, also appears to have protective effects against asthma and may help stabilise appetite hormones, thus reducing overeating.

In short, having a little of all kinds of bacteria, even the strains regarded as problematic, may be critical for your overall health. As in everything, balance is the key.

WellBeing | special report
BACTERIA IN YOUR DIGESTIVE TRACT



wellbeingshop.com.au

We hope you enjoyed our WellBeing Special Report.
Here are some other Special Reports we think you might like

Gluten	Self-Love	Superbugs
Depression	Bone Health	Heavy-Metal Toxicity
Back Pain	Sleep	Summer Skincare
Muscle	Anxiety	Candida
Mindfulness	Motivation & Momentum	Sugar
Tea	Menopause	Colds & Flus
Music And Health	Ethical Eats	Type 2 Diabetes
Irritable Bowel Syndrome	Stress	Life Transitions
Aphrodisiacs	Bacteria In Your Digestive Tract	Weight-Loss Diets
Workplace Wellness	Sex	Hair Health
Eye Health	Brain Health	Allergies