

MICROBIOME AND THE BRAIN EBOOK





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If microbes are controlling
the brain, then microbes are
controlling everything.

John F Cryan

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Microbiome

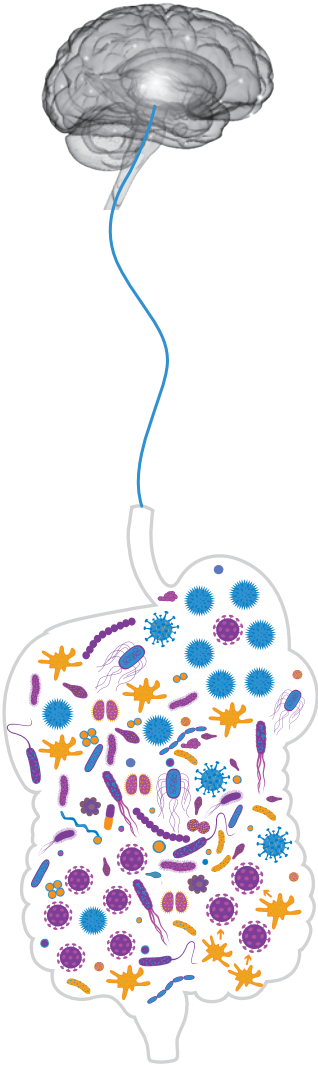
You may have come across articles and books recently about the microbiome, gut bacteria and gut health.

In this eBook, when we refer to the microbiome, we are talking about the bacteria that live in and on you.

Your microbiome includes all the little bacteria that is part of you, from your mouth and nose, to your bottom, your skin and almost every millimetre of you inside and outside.

For this eBook we are focusing on the gut bacteria in particular and the top tips are designed to give you some ideas on how to improve the diversity and effectiveness of your own individual bacteria that support you every day.

Basically, you are made up of approximately 1,000,000,000,000 bacterial cells. Over 40,000 strains have already been identified, and believe it or not, approximately 99% of you is made up of microbial genes and only 1% human. This is pretty amazing, your microbiome live inside you, and even inside your cells, and they help keep you alive.



Links have been made between your microbiome and a range of non-communicable diseases from obesity, to auto-immune disorders, diabetes, autism, to multiple sclerosis, epilepsy, Alzheimer's and Parkinson's disease, and even to depression and anxiety – our main modern day mental health challenges in today's world.

The increase of many of these diseases can be linked to changes in our microbiome, which in turn can be linked to changes in our modern world – from changes in birth practices and food development, to our increased use of antibiotics and modern dietary shifts. Again, for more information on these changes please listen to the online webinar series **here**.

Consider this - your bacteria are your friends. They die when you die, and like most living beings they want to live – that is why they work so hard to keep you healthy! Your job is to look after them.

We have good ones (commensals) and bad ones (pathogens) and, what is even more amazing, some bacteria whose job is to feed other bacteria. If everything is working well the commensals help us by dispensing with the pathogens, so we need to be careful of the ratio of pathogens to commensals.

Plus, when your bacteria are hungry, they will send a message through your vagus nerve to your brain asking to be fed! Make sure you are feeding the commensals!

So, here are the experts top ten tips for keeping your microbes healthy:

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|------------------------------|-----------------------------|
| 1 Eat real food | 6 Maintain a healthy weight |
| 2 Minimise sugar | 7 Try fasting |
| 3 Exercise | 8 Eat antioxidant-rich food |
| 4 Get your Omega 3s | 9 Avoid emulsifiers |
| 5 Reduce alcohol consumption | 10 Reduce antibiotics |

#1 EAT REAL FOOD

Most of us know that eating healthy food is critical, yet we often put a lot of processed foods into our bodies. So, before you worry about eating healthy food, a first step is to reduce the unhealthy food. Avoid things like processed meats, refined grains, sweet and salty snacks.

Research has found people with a high processed diet have higher rates of anxiety and depression as well as other non-communicable diseases. Children born to mothers who eat a diet high in processed foods can show higher rates of psychological problems.

A diet of processed foods can increase inflammation and let dangerous toxins through to your brain leading to increased risk of brain-based disorders.

The Mediterranean diet - vegetables, fruit, fish, high fibre grains, nuts, eggs, quality fats and oils (ie, olive), has been found to add years to your life and reverse the damage caused to your microbes from a diet high in fats, sugars and processed foods. Try to increase the diversity of your bacteria by adding variety to your diet.

In turn, fast food is feeding your pathogens, so it is time to reduce the consumption of processed foods and start feeding your commensals!



#2 MINIMISE SUGAR

Many of your pathogens love sugar so every time you feed them you are encouraging them to multiply, making it harder for your commensals to keep them in check.

Reducing your sugar intake (see tip number 1) will support your microbes. Stress increases our need for sugar, so be alert for your stress levels.

Out of all the many changes you may choose to make, reducing sugar can significantly help your physical and mental health. Try real honey as a replacement as it contains oligosaccharides, which act as a prebiotic. Prebiotics and probiotics are found in foods and they are like fertiliser for your bacteria!

Honey is also associated with decreased anxiety, improved memory and lower inflammation. Just make sure it is real honey! Lots of honey on the market is not 'real'.



#3 EXERCISE

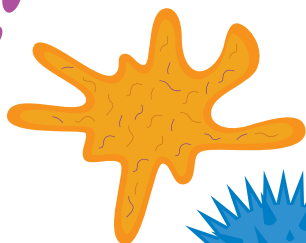
There are so many benefits that exercise brings us, in this case, we are talking about keeping your microbiome and your brain happy.

When we are feeling flat, or experiencing depression and anxiety, we may not feel like moving, yet this is just the time we need to move the most.

Hippocrates quote, from 2000 years ago, is still relevant today, "If you are in a bad mood go for a walk. If you are still in a bad mood go for another walk."

Exercising is great for our bacteria as it helps them move and squeeze and every time they get a little squeeze they release anti-inflammatory chemicals that support your immune system and your brain.

Exercise has also been shown to support the brain by improving mood, increasing cognition, reducing digestive issues and inflammatory issues, and helping depression. Basically, your body will thank you and so will your microbes.



#4 GET YOUR OMEGA 3s

Many fats, such as saturated fats, can increase inflammation and impact your microbiome, yet Omega 3 oils do the opposite. They are polyunsaturated and can help increase diversity in the gut and reduce inflammation.

There are many foods that are high in Omega 3s. Fish is the one most people are aware of, so increase your consumption of (organic if possible) salmon, trout, tuna, sardines and other white fish. It is important to be careful of some of the 'big' fish that contain high levels of mercury.

Omega 3s can also be found in nuts, olives and soybeans and adding quality oils (such as olive, flaxseed or canola) to your salads is another wonderful way to boost your Omega 3 intake.



#5 REDUCE ALCOHOL

This is the one that many of us know, yet may prefer not to hear. Technically, alcohol is a depressant and can alter the health and diversity of your microbiome and inhibits your commensals in their work.

When mice are exposed to alcohol vapours, they have a reduction in microbial diversity. Imagine then what is happening inside you if you consume alcohol on a daily basis.

There are lots of research studies that will tell you red wine is 'good' for you and if you are going to have alcohol this may be the better option. Yet your microbes may prefer you to reduce consumption and give your commensals a fighting chance.



#6 MAINTAIN A HEALTHY WEIGHT

We are aware that our input of calories needs to match our output of energy in order to stay at a stable weight. Your bacteria play a crucial role in the hunger – satiety cycle with the release of ghrelin (which tells you to eat) and leptin (which lets you know you are full).

The communication between your microbes and your brain is important and can be the difference between everything working well and potentially overeating. For instance, *E. Coli* bacteria in your gut produce chemicals to suppress hunger and should send a message to your brain about 20 minutes after eating. This is why savouring your food is so important, as it allows time for the messages to get through.

Psychological stress can elevate ghrelin which may lead us to ‘comfort’ eat. This sees the reward circuit being activated by food and can lead to increased dopamine and over time increased waist bands.

Losing weight has been found to increase the diversity of the microbiome, allowing greater balance, lowering inflammation and increasing mood. While losing weight is not always easy, yet when you know your bacteria are playing a part in your weight loss, it is worth having a conversation with them, as you are in control of what they get fed (although are they in control of what you put it in your mouth?).



#7 EAT ANTIOXIDANT-RICH FOOD

We hear a lot about antioxidants and many of us take supplements to provide our bodies with the antioxidants we need. Yet much of our antioxidant needs are taken care of by our bacteria, if we are feeding them well.

To improve your chance of increasing antioxidant production, increase your consumption of green tea, blueberries and strawberries, turmeric and cocoa. Coffee also has some benefits for antioxidants, although if you are also including lots of sugar it may be a moot point.

Chocolate is the same, if you are going to eat chocolate, try 70% dark where possible as the antioxidants have a fighting chance without the milk and sugar content found in other lower cocoa percentage chocolate.

This is also where red wine features. The resveratrol found in grape skins helps support your microbial diversity. As my Nan would say though - everything in moderation!

Please note many of the neuroscientists will tell you that most of what you need can be obtained from a healthy diet. One comment made was that many probiotics you can buy off the shelf do not work and you are 'drinking money'.



#8 TRY FASTING

Fasting has been found to strengthen cells and lengthen life and can be anything from the popular 5:2 programme, to simply fasting overnight for 12 hours between meals.

Fasting changes your microbiome by increasing levels of Akkermansia, which helps the gut produce more mucus, providing protection against pathogens. Essentially, by giving your gut a break now and again you are supporting your gut to support you.

#9 AVOID EMULSIFIERS

Emulsifiers are the things in food that bring oil and water together and help them work. Natural emulsions exist, such as milk, yet many emulsifiers are not so innocuous. Emulsifiers are used in industrial food processing and have been shown to negatively effect the gut lining and the diversity of your microbiota.

This means you need to be careful about consuming processed foods, cakes, packaged products, even ice cream (choose sorbet if you like).

Emulsifiers are used significantly in gluten free foods, which means solving one issue could actually be causing others. The message here is to avoid all processed foods – see point number one.

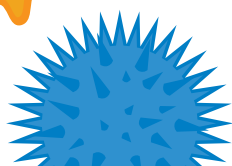
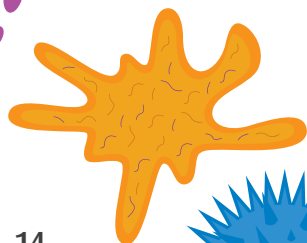
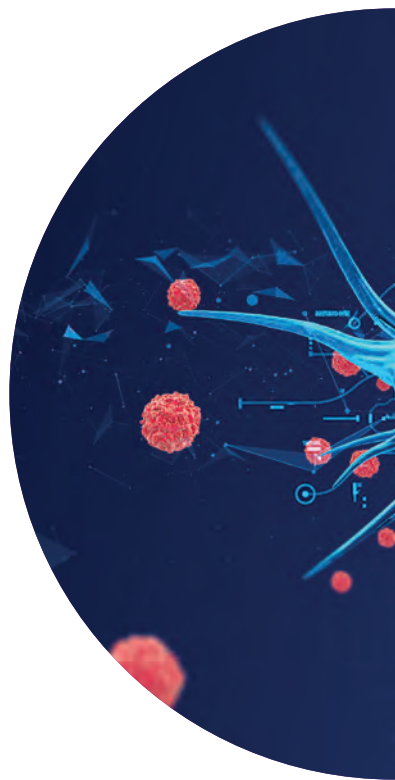


#10 REDUCE ANTIBIOTICS

Whilst antibiotics have saved many lives, there seems to be a reliance on them in modern medicine and our microbes are not happy about it. Taking an antibiotic kills your bacteria – all of them. It does not discriminate – even your poor little commensals get killed off. Which means you have to start again. Remember your commensals are the good ones, the ones that are running around removing pathogens and keeping you healthy. When you kill them, you open yourself up to other potential challenges.

One day we will be able to selectively target specific pathogens, yet for now we can't, so it is worthwhile being cautious when antibiotics are suggested. Do you really need them? Are they potentially causing more issues than they are going to solve?

If the antibiotics are being prescribed for a serious problem, and your doctor is insistent, then you may need to take them. Yet consider the scary statistic that 44% of doctors prescribe antibiotics just to get a patient to leave their surgery and 72% have prescribed antibiotics even if they don't know if they are dealing with a viral or a bacterial issue.²



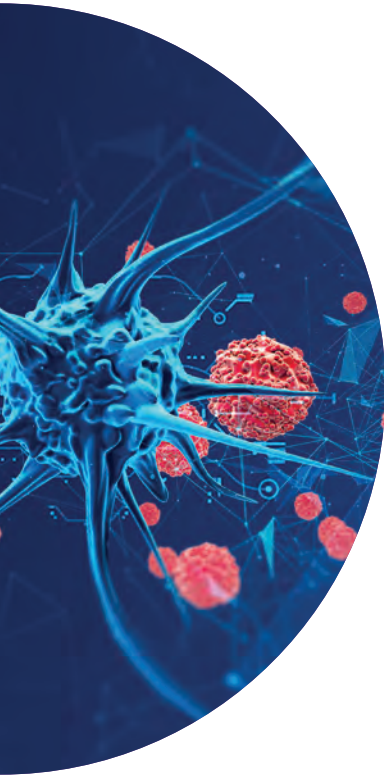
BONUS TIPS

After spending a week with neuroscientists in Venice in 2018, I decided there were a number of things that I would choose to do differently.

I was already a pescatarian and mostly vegetarian. Generally, I was fairly healthy, drinking alcohol maybe once a week, exercising several times a week, eating very little processed or fast food, with no soft drinks and only one course of antibiotics in the last thirty years. I could still see there were areas where I could make changes to improve my gut health.

So, I have changed the following:

- I have added yoghurt into my diet for breakfast
- I have added an almost daily dose of olives to my diet, as well as plenty of olive oil which provide a wonderful prebiotic effect
- Cheese has increased even more as fermented cheese (you have to search for it) is great for a range of microbes
- I have increased the variety of vegetables I consume
- My alcohol consumption has decreased to almost zero
- My sugar consumption has dropped to two squares of glorious dark chocolate when required
- I have significantly decreased pasta and refined grains in my diet
- Additional “super greens” and omega 3 supplements are still on the agenda!



COURSE TESTIMONIAL

“Not only is this online course utterly fascinating, Sue’s ability to take the research from her learnings and present it in a way that is easy to relate to is what makes this e-course stand out.

My three key takeaways were:

- What is the microbiome, where is it and how do we get it? (PREPARE YOURSELF)
- The importance of the microbiome in our body, the implications this can have on our brain, and ultimately our mental wellbeing (MIND BLOWING)
- Real life tips on improving our microbiome (SUPER EASY and no preaching)

I’ve been astounded at how a few lifestyle changes and an awareness around feeding the “good bacteria” can literally change the day to day. Three weeks in doing these small changes and I am jumping out of bed in the mornings with a spring in my step and an even bigger zest for life. My capacity to concentrate has improved and I feel like I add more value both professionally and personally as there is a “switched on, using the awesome part of my brain” feeling ALL day. The effect this knowledge has had on me personally has been incredible and that’s in just three short weeks. I can’t wait to see the effect after six months.

THANKS SUE!!!

”

Careen Redman People Rock



WRAP UP

This e-book has given you information on how your microbes are supporting your life and it is now your turn to support them.

At the Langley Group we say “treat yourself as a scientific experiment...” We have given you many tips in this publication to try so make some changes and note the differences. Increase your awareness of your bacteria, so you can make a conscious choice about which ones you are going to feed.

If you want to do more, here are some next steps:

- Listen to our three part webinar series
Microbiome and the brain: Using your gut for mental wellbeing.
- Purchase this fascinating read “The Psychobiotic Revolution” by Scott C. Anderson
- Or find out more about your own microbiome by getting your microbes tested. Microba provide testing with an easy to read, yet detailed report of your microbial dna. Visit order.microba.com and enter the Promotional Code LANGLEY during purchase to receive \$30 off your first kit so you can explore your microbiome and discover how to take care of it. If you experience any problems with your purchase please contact info@microba.com.

We wish you every success in finding ways of showing up more frequently, as the best version of you!



1. Adapted from “The Psychobiotic Revolution” by Scott C Anderson with John F Cryan and Ted Dinan
2. Longitude Prize survey, UK GPs, 2014
3. Neuroscience School for Advanced Studies - <http://nsas.it/>



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