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# Eat happy!

Could changing your diet improve your mood? Dr **Justine Butler**, head of research at Viva!, takes a look

**A** healthy vegan diet lowers the risk of obesity, diabetes, heart disease and cancer. But did you know, it may also help contribute to a feeling of wellbeing?

Depression affects around 300 million adults worldwide and one in six adults in the UK experience moderate to severe depression. Many contributing factors to our mental health are outside our control, such as the cost of living crisis, for example, but diet and lifestyle changes can help.



## Viva!

Viva! Health is part of the charity Viva!, Europe's largest vegan campaign group. They monitor scientific research linking diet to health and provide accurate information from which you can make informed choices about the food you eat. [viva.org.uk/health](http://viva.org.uk/health)

**Above** Eating a wide range of plants can help your mood.

*Mood food* EAT HAPPY!

## GUT FEELING

The human gut microbiome consists of over 100 trillion microorganisms and weighs around 200g – the same as an adult stoat! It impacts our health in many ways but we're only just discovering how gut bacteria modulate mental health through a complex network of biological pathways known as the gut-brain axis. This two-way communication channel involves a range of pathways linking gastrointestinal activity with emotional and cognitive processes. This makes perfect sense when you consider how feeling anxious can lead to an upset stomach and how chronic diarrhoea or constipation can trigger mood changes.

Interestingly, the gut and brain share a common embryonic origin before they develop into distinct organs. This may be why the enteric nervous system (ENS) that lines our gut is sometimes called the 'second brain'.

## CHEMICAL BALANCE

Certain gut bacteria produce compounds such as serotonin, dopamine and gamma-aminobutyric acid (GABA), which help regulate our mood and behaviour through various pathways. An imbalance in the gut microbiome (dysbiosis) can reduce the number of these beneficial bacteria, potentially leading to symptoms of depression and anxiety.

The 'happy chemical' serotonin acts as a hormone in the body, helping to regulate mood, sleep and appetite. In the brain, it acts as a neurotransmitter, sending signals between nerve cells. About 90 per cent of serotonin is produced in the gut but around 10 per cent is made in the brain, where it plays a key role in influencing mood, reward, anger, aggression, appetite, memory and sexual feelings. Scientists say it's difficult to find a human behaviour that's not regulated by serotonin.

Our bodies need the amino acid tryptophan to make serotonin and good plant-based sources include protein-

rich tofu, tempeh, edamame and other beans as well as quinoa, oats, nuts and seeds – especially pumpkin seeds. For it to be converted into serotonin in the brain, tryptophan must cross the blood-brain barrier. Carbohydrates help this by increasing insulin, which redirects amino acids that compete with tryptophan to other tissues, allowing more tryptophan to enter the brain. To enhance serotonin production, pair oats with nuts, quinoa with tofu, and brown rice with beans.

It's best to get tryptophan from foods rather than supplements (5-HTP), which can interfere with anti-depression medications such as citalopram (Celexa), fluoxetine (Prozac) and sertraline (Zoloft).

Dopamine also acts as a hormone and neurotransmitter and is often referred to as the pleasure, or motivational, molecule. It travels through the bloodstream, affecting various bodily functions and as a chemical messenger in the brain, affecting how we feel pleasure and reward. Sex, shopping, music, nature or food, for example, can all trigger a dopamine release.

Dopamine is produced from the amino acid tyrosine found in tofu, tempeh, edamame and other beans, nuts and seeds – especially sesame seeds. Diets high in saturated fat may reduce dopamine signalling in the brain, so avoid animal fats such as meat, eggs, butter and full-fat dairy as well as palm and coconut oils and high-fat processed foods.

Your gut bacteria and brain also produce GABA, which in the brain acts as an inhibitory neurotransmitter, reducing anxiety and stress and promoting calmness. Emerging evidence suggests that changes in your gut microbiome can affect levels of GABA in the body and brain, and that lower levels can contribute to anxiety.

## HOW TO IMPROVE YOUR MICROBIOME

The average UK diet is low in variety, partly because 75 per cent of the world's foods come from just 12 plant and five animal species – the opposite of what your gut microbes yearn for. Unhealthy diets high in red and processed meat, high-fat dairy foods, fried foods, refined cereals, sweets and pastries are likely to lead to poor gut health and dysbiosis, which is linked to depression. To add to this, fatty and processed foods are pro-inflammatory, having a detrimental effect on the cardiovascular system, which increases the risk of depression.

For your microbiome to work its magic, you need to supply the right ingredients. This means providing good bacteria directly or eating those foods your good gut microbes thrive on. Probiotic live bacteria

are available in tablets and capsules but are also found naturally in fermented foods, such as sauerkraut, kimchi and kombucha.

Prebiotics are the foods your gut microbes crave. All fibre-rich and starchy foods are prebiotics, which means most vegan staples fit the bill – fruit and veg, wholegrains, pulses, nuts and seeds! Our gut microbes feast on them and produce health-beneficial compounds in return. Just as we have our own favourite foods, so do the different types of bacteria. That's why eating a wide variety of plants, along with some probiotics such as kimchi or sauerkraut, can improve your gut health substantially. Look after your gut bacteria and they'll look after you! ❤️



## FIBRE FACTS

- Providing plenty of fibre keeps your microbiome healthy and protects and maintains the integrity of your gut lining, reducing the risk of low-level inflammation linked to depression. Gut microbes also use fibre to produce chemical by-products called short-chained fatty acids and these also confer wide-ranging health benefits to us.

- 30g of fibre a day is a good target and as said, it's best to get this from a wide variety of plant foods. Remember – meat and dairy contain none! Use wholemeal bread, brown rice and wholewheat pasta instead of white, refined versions. Fruit and vegetables such as apples, pears, raspberries, Brussels sprouts and avocados are rich in fibre. Peas, beans and lentils are also excellent sources of fibre and protein and can be added to many meals. Nuts and seeds, such as almonds and chia seeds, can be added to breakfast cereals, desserts and smoothies for an extra boost. These foods are rich in the fibre and polyphenols your gut microbes love.

- You don't need to worry about eating too much fibre unless you have an inflammatory bowel disease such as Crohn's or colitis, where excess fibre can trigger or worsen symptoms.