

Feeding the gut microbiome



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The gut microbiome

The human gut is host to trillions of bacteria, collectively called the gut microbiome. There is no part of the body not influenced by the gut microbiome. This staggeringly complex ecosystem plays a critical role in determining our health.

The different species of bacteria, together with their quality and quantity, is individual to you and a reflection of your journey through life - mode of birth, with whom you spend intimate time, the food you eat, stress levels and whether or not you are interacting with soil.

Bacteria help you to digest your meals, make essential nutrients that you are unable to produce on your own, influence the expression of your DNA, promote the transmission of nerve messages to and from the brain, and keep the immune system in good working order. 70% of your entire immune system is located within your gut!

A number of studies have shown how gut bacteria influence mood. Scientists have found that gut bacteria produce neurotransmitters such as serotonin, dopamine and GABA all of which play a key role in mood. It has been discovered that two strains of bacteria, lactobacillus and bifidobacteriums, can positively influence anxiety and depression.

Obesity involves many pathways, but recent obesity studies in relation to the gut microbiome found that obese people had demonstrably different microbes from those that were not obese.

If gut microbes are out of balance, it can increase your risk of developing a host of chronic diseases such as diabetes, inflammatory bowel disease, and autoimmune disease, as well as neuropsychiatric illnesses like schizophrenia, ADHD, obsessive-compulsive disorder and chronic fatigue syndrome.

Soil and the environment help shape the human gut microbiome. Recent research concludes that connection with, and food from, healthy soil is crucial to the health of our gut microbiome. Depletion of microbial richness in our soils claim the researchers has had a serious and deleterious effect on our own health.

Factors that negatively impact gut health

- non-steroidal anti-inflammatory drugs (NSAIDs) such as ibuprofen as these can derail gut bacteria
- antibiotics, both through unnecessary medical use & routinely treated farm animals.
- agricultural pesticides; glyphosates have a detrimental effect on gut bacteria leading to a weakening of the immune system.
- mycotoxins produced by mould can increase levels of harmful gut bacteria and deplete beneficial microbes.
- too much stress will upset the microbial balance in the gut
- lack of physical exercise will negatively impact your gut microbiome
- lack of sleep, a good night's sleep supports a healthy gut
- sugar, refined grains, processed meats and all ultra-processed foods encourage the growth of pathogenic bacteria

Foods to support a robust microbiome

Diet is a key element in a healthy gut microbiome. We can make a difference to the diversity and quality of microbes and proper functioning of our gut every day with the foods we choose to eat. A diet of naturally grown vegetables, legumes, whole-grains, fruits, nuts and seeds with the addition of a little food of animal origin, if you so wish, will support the diversity and quality of the gut microbiome

Key diet considerations

Eat plant rich

Your gut microbiomes loves plants and knows how to utilise the fibres and phyto-nutrients to benefit the microbiome and our health

Diversity

Eating a diverse range of foods helps create gut microbial diversity

Food from a natural farming systems

Natural farming avoids chemicals and enhances soil life, increasing a plants micro-nutrient & phyto-nutrient system

Food preparation

Use methods of preparing food that maximise nutrition - fermenting, dehydrating, sprouting, low heat.

Of particular importance for gut health are polyphenols, probiotics, prebiotics, insoluble fibre and resistant starch

Polyphenols like many phytonutrients are powerful antioxidants. Once consumed, only about 5-10% of polyphenols are directly absorbed in the small intestine, the rest make their way to the colon where they feed beneficial bacteria and promote the health of the gut. Gut bacteria convert polyphenols into metabolites which are readily absorbed and have many health benefits. Polyphenols are found in many **nuts, seeds, fruits and vegetables including blackberries, blueberries, onions, olives, raw chocolate, linseed, apples, hazelnuts, pears, red cabbage, cherry, plum, red grapes & green tea**

Probiotics are live microorganisms that inhibit opportunistic pathogenic organisms and promote a diverse & healthy microbiome. Probiotics are found in lacto fermented foods & beverages. **Fermented vegetables** are packed full of beneficial bacteria. **Fermented milk** products contain probiotic bacteria species that can be of benefit. **Raw, unfiltered apple cider vinegar** contains bacteria that might have a probiotic effect.

Prebiotics are fibre compounds that pass through the GI tract undigested and provide a selective feed for beneficial species of bacteria that live in the large intestine. Not all fibres are prebiotic but all prebiotics are fibre

There are two major types of fibre, soluble and insoluble. Beneficial bacteria cannot use or digest insoluble fibre. **Soluble fibres**, however, are prebiotic and are present in a range of vegetables & fruit including **garlic, onions, dandelion, leeks, asparagus, artichokes, apples & plums**

Resistant starch is a form of starch that is also considered a dietary fibre. Resistant starch cannot be digested by amylases in the small intestine and passes to the colon to be fermented by bacteria. Resistant starch is found in foods such as, **cooked and cooled potato, pasta or rice either eaten cold e.g. pasta salad or reheated, lentils and oats.**

Prebiotic fermentation by gut bacteria produces beneficial end products of short-chain fatty acids like propionate and butyrate. These short-chain fatty acids contribute to healthy intestinal tissue & immune function.

Fibre is beneficial in increasing the diversity and health of gut bacteria and supporting the integrity of the mucosal barrier in the gut. Research on the interaction of fibre, gut microbes and the intestinal barrier system undertaken by Eric Martens, a microbiologist at the University of Michigan suggests that "if you don't feed the fibre loving bacteria, mucous munching bacteria proliferate and, they can eat you".

With many digestive issues, the resulting gut dysbiosis actually causes these important foods to worsen symptoms. In these circumstances it would be best to work with a holistic nutritionist to find the best approach to heal the gut before incorporating these fibre rich foods into the diet.

RECIPES

Cook rice, cool, cover & store in the fridge. Use within 3 days in the following two recipes.

Basmati rice with leeks, dulse & sauerkraut

serves 4

2 tablespoons olive oil

4 leeks, trimmed, cut in half length ways, washed well & thinly sliced

4 garlic cloves diced

4 shallots finely diced

250 ml vegetable stock

small handful dulse briefly rinsed and chopped

10 tablespoons cooked basmati rice

4 tablespoons sauerkraut

black pepper

Put the oil in a pan. Add the leeks, garlic and shallots. Cook very gently for 10 minutes to soften.

Add the stock and cook for a further 2 minutes.

Add the dulse & rice and heat through thoroughly for 5 minutes and all the liquid has been absorbed by the rice. Divide between 4 bowls. Top with a spoonful of sauerkraut and a twist of black pepper.

Basmati rice & leek soup

serves 4

5 large leeks white part only thinly sliced

4 cloves garlic crushed

1 medium carrot diced

1 tablespoon olive oil

1 tablespoon butter

1 litre vegetable stock

1 bay leaf

3 sage leaves

1 dessertspoon chopped thyme

6 tablespoons cooked basmati rice

salt /pepper

Gently cook the leeks, garlic & carrots in the olive oil & butter until soft. Tip in the stock, bring to the boil, add the herbs and simmer gently for 20 minutes.

Add the basmati rice and boil for 5 minutes.

Blitz in a processor until well blended. Season to taste.

Buckwheat bread

400g hulled whole buckwheat

250ml water + extra for soaking

½ teaspoon salt

1 teaspoon finely chopped thyme

1 teaspoon honey

Place the buckwheat in a bowl Cover with water and leave overnight in a warmish place covered with a cloth.

Pour off any excess water but do not rinse. Pop ½ the buckwheat into a blender with the water and salt & blend until very smooth. Tip in the

remainder and pulse 2 or 3 times to mix well. Stir in the honey & thyme.

Pour into a well-oiled or buttered bread tin and leave, covered with a cloth in a warm place for 18 hours. If the loaf begins to rise more than 1 inch bake before 18 hours. Heat the oven 220C/425F/gas mark 7 and place in the middle to bake for 35 – 45 minutes until firm. Wrap in parchment to store.

Spiced linseed crackers

300ml carrot juice

175g linseed

knob of grated ginger, 2 finely chopped garlic cloves, 1 finely chopped chilli, 1 teaspoon miso

Roughly grind 1/2 the linseed, tip into carrot juice with the whole seeds and leave for 30 mins. Stir in the kimchi flavours.

Using a spatula spread the mixture thinly onto 2 baking parchment lined dehydrator trays.

Dry in dehydrator at 45°C until crisp. No dehydrator - use a very low oven. Break into pieces and store in an airtight container.

Idli, dosa & uttapam batter

Idli, dosa & uttapam can be made from the same basic fermented batter.

Idli are small steamed cakes, dosa are thin fried pancakes and uttapam are thicker pancakes topped with red onions tomatoes & coriander.

450g idli rice or basmati rice

150g lentils – white if you can find them or black but red lentils work well

1 teaspoon salt

Soak the rice and lentils separately in plenty of water overnight.

Drain the water from the lentils then in a blender, with enough water, blend until you have a thick, smooth batter. Turn into a bowl.

Drain the water from the rice, add the salt and blend well with the addition of water to make a just pourable consistency. Add to the lentil mixture and whisk well together for a couple of minutes so the mixture is well aerated.

Pour the batter into a large jar that allows plenty of room for expansion.

Cover and leave to ferment in a warm place for around 24 hours. The time will vary depending on the temperature of the room. When it is well risen and bubbly, it is ready to use.

Artichoke houmus

350g peeled and roast Jerusalem artichoke

2 tablespoons tahini

3 cloves garlic crushed

juice and zest of 2 lemons

black pepper & salt

Pulse the cooked artichokes to a smooth consistency add the remaining ingredients and blend adding water if necessary until you have a smooth cream.

Falafel with hummus & red sauerkraut

serves 4

250g chickpeas, soaked in water for 18 hours

4 heaped tablespoons red sauerkraut (or any delicious fermented veg)

Hummus

½ the raw, soaked chickpeas

1 clove of garlic, crushed

2 tbsp lemon juice

pinch of ground cumin

¼ tsp salt

2 tbsp tahini

Falafel

½ the raw, soaked chickpeas

1 small onion, very finely chopped

1 clove of garlic, crushed

1 dessertspoon olive oil

2 tbsp chopped parsley

2 tbsp chopped coriander

1 tsp ground cumin

¼ tsp chilli powder

1 tbsp gram flour

¼ tsp salt

First make the hummus. Cook half the soaked chickpeas until tender. Strain the chickpeas, reserving about 150ml of the cooking liquid, and place in a food processor with the garlic, lemon juice, cumin, 1½ tbsp of the cooking liquid, salt and tahini. Purée until smooth. If the mixture is too thick, add a little more cooking liquid.

To make the falafel, place the raw chickpeas in a food processor and pulse until lightly broken. Add the remaining ingredients and continue pulsing until you have a smooth but distinctly grainy purée.

Gently form the mixture into about 20 small patties, making each roughly the size of a 50p piece.

Place on an oiled baking tray and bake in a hot oven.

Serve the hot falafel with hummus and sauerkraut.

Sauerkraut

For every 2 kilo cabbage you need 3 tablespoons of salt

Shred the cabbage and place in a large metal bowl. Sprinkle over the salt and massage until the juices starts to flow. Cover with a cloth and leave overnight.

The next morning stir in any spices like fennel, cumin or juniper. Place about 2" of cabbage into the glass jar and press firmly to bring up the juice.

Firmly compress the layers of cabbage leaving some space at the top of the jar. Weight the cabbage down (a small jam jar filled with water is perfect) making sure it is submerged under the liquid.

Check frequently the cabbage is still submerged adding if necessary a little more brine liquid.

Let the jar sit at room temperature. After about a week the cabbage will have fermented sufficiently to be eaten but you can leave it for a further 2 weeks for the flavour to further develop. Before fitting a lid and storing in a cool dry place, experiment to find the right strength for you. Once you start eating the cabbage, keep in the fridge.



Optimal human health comes from eating nutrient dense foods produced and processed in ways that maximise both the quality and quantity of nutrition.

Ecological health is integral to human health. Food grown using nature based, regenerative farming practices, manage sustainably the complex interactions between water, energy and food, thus protecting and enhancing the environment whilst producing nutritious food.

- buy organic food whenever you can
- eat seasonally
- source your food as locally as possible
- join a box scheme
- grow your own (garden, allotment or community garden)
- support food & farming campaigning organisations

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Daphne Lambert is an eco-nutritionist focusing on the interactions between agriculture, ecology and human nutrition.

Greencuisine Trust works to bring about a transformation in the way we eat. Through practical food experiences the Trust highlights the connections between our well-being, natural resources, the environment, and our planet.



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