IS MALABSORPTION LEAVING YOU TIRED?

Why illness, older age and nutrient 'inhibitors' can all affect the benefit we get from our food

You would be forgiven for thinking that food, once committed to your stomach, trundles along to carry out its designated job. However, your body doesn't have it that easy. Even if your dinner successfully navigates the intricate processes required to digest and absorb nutrients into the blood stream, the food itself may not have high bioavailability.

Bioavailability

Bioavailability is the extent to which nutrients can be used by the body. While it's usually high with macronutrients (carbohydrates, fats and proteins) it can vary widely for micronutrients (vitamins and minerals). Even in the best possible circumstances, not everything you eat will be absorbed.

Malabsorption

Malabsorption — when we don't absorb all of the nutrition from the food we eat — can result in symptoms such as tiredness or persistent diarrhoea, along with deficiencies in iron, folate, vitamin D or vitamin B12. If insufficient energy is being absorbed (possibly due to illness, food intolerances or inflammatory bowel disease), poor growth in children or weight loss can also occur. As we get older, we may also be at increased risk of malabsorption as digestion can become less efficient.

Where does it start?

Once food is in your mouth, digestive enzymes and gastric juice start their magic of making a nutrient bioavailable. These secretions don't particularly benefit from life in the fast lane, however, and can be enhanced by slow, mindful eating and proper chewing.

But even before we eat, food preparation can have an impact. Cooking vegetables such as carrots and spinach, for example, has been found to increase the bioavailability of beta-carotene, which the body converts to vitamin A.[1]

Inhibitors

Regardless of the food combinations that we like to eat, some nutrients just don't work well together. Substances known as inhibitors can reduce nutrient bioavailability. Phytic acid, for example, is an inhibitor found in cereals, seeds, nuts, legumes and bran, which can bind to minerals making them less available to us.

Iron absorption can also be inhibited by other nutrients; although whether we are consuming haem iron (from animal sources) or non-haem iron (mainly found in plants) can make a difference. Of the two types, non-haem iron has less bioavailability, making it an important nutrient to watch for vegetarians and vegans.

Research has shown that calcium, to a small degree, phytic acid, and the tannins in green and black tea can all have a negative effect on iron absorption. In the case of tea, plant-based compounds called catechins, which are a beneficial nutrient in tea, bind to the iron, reducing the benefits of both. Haem iron is less affected. However, it may still be best to indulge in your cuppa about an hour before or after meals to avoid any potential interference. Polyphenols in coffee have also been found to reduce iron absorption, but to a lesser degree.[2]

Positive pairings

One way to support nutrient absorption is by focusing on positive pairings. In the case of iron, for instance, vitamin C can work wonders — so a bell pepper and tomato salad, for example, would support iron

Possible causes of leaky gut include irritants such as alcohol, aspirin, non-steroidal anti-inflammatory drugs

absorption from both vegetarian and non-vegetarian sources.

Vitamin D, found in oily fish, helps to support calcium absorption — although recent research shows that uptake may depend upon gut health status. (See p.5) Or fat, which we have been warned off eating for the last few decades, is essential for absorbing the fat soluble vitamins A, D, E and K, as well as other nutrients — so that consuming a salad with a high fat dressing, versus a fat free one has been found to significantly increase absorption of carotenoids (colourful beneficial pigments in fruit and vegetables).[3]

Pre-treatment methods such as fermentation, soaking and germination can also reduce the effect of inhibitors; so soaking nuts and seeds overnight if making bircher, for instance, is thought to increase bioavailability.

Folic acid (B9)

Vitamin B9, more commonly known as folate, has been found to be more bioavailable in its synthetic form as folic acid.[5] Folic acid supplementation is recommended for women who are planning to become pregnant or who are pregnant. However, the NHS states that folic acid supplements are not suitable for everyone and to consult a GP.

Vitamin B12

Vitamin B12 has a complex pathway to reach cells where it is needed; its route involving a sequence of binding and release from proteins produced in the mucosal stomach lining. Because the efficiency of this stomach lining declines with age or with some illnesses, it can lead to impaired bioavailability of vitamin B12. For this reason, B12 supplementation may be recommended as we age.

Smoking and alcohol

It is no surprise that smoking and excessive alcohol consumption may do nothing to enhance nutrient absorption. Both have been found to interfere with the balance between vitamin D and calcium, which can lead to bone loss and fracture.[6] Smokers may also need more vitamin C in their diet.

You are what you absorb?

Although you may often hear 'you are what you eat', perhaps a more accurate version could be 'you are what you absorb'. If you are concerned about your nutrient status, a registered nutritional therapist should be able to advise on testing and support for potential nutrient deficiencies.

Henri Davy

A 'TRIAGE THEORY' OF NUTRITION

The concept of 'triage' is something we would encounter in a hospital A&E. While urgent cases are rushed through, those of us who have merely got into an argument with a wheelie bin on a Saturday night will have to go to the back of the queue. Put simply, triage is a system of assessment and prioritisation.

In 2006, Dr Bruce Ames, an American biochemist, published his 'triage theory' of nutrition, arguing that the body directs vitamins and minerals to where they are needed most urgently — potentially to the detriment of other biological processes when there aren't enough nutrients to go around. His hypothesis was that evolution always prioritises what is needed for immediate survival. A simple illustration would be to say that we could survive with bad skin or brittle hair, which can be signs of poor nutrition, but we won't survive if vital organs and processes aren't maintained. However, Ames proposed that optimal levels of vitamins and minerals were needed to prevent diseases that may develop because of ongoing deficiencies.

For people who are suffering with malabsorption, deficiencies in certain nutrients can be common. If you are concerned, speak to your GP or consult a registered nutritional therapist.

References:

1. Doi.org//10.1093/jn/128.5.913
2. pubmed.ncbi.nlm.nih.gov/6896705
3. Doi.org//10.1093/ajcn/80.2.396
4. Doi.org//10.1093/ajcn/80.4.911
5. Doi.org//10.2741/e575
6. Doi.org//10.1038/s42255-020-0261-2
7. Doi.org//10.1093/ajcn/nqaa085

LEAKY GUT: CAUSES AND CAUTIONS

A single layer of cells called the intestinal epithelium acts as a protective barrier against harmful molecules while allowing nutrients and water to be absorbed. It is also involved in regulating immune function and communicating with gut bacteria.

When damage occurs, known as gut permeability or leaky gut, bacteria and molecules can pass through the intestinal epithelium into the blood stream, leading to inflammation and contributing to chronic diseases. It is suggested that leaky gut may contribute to autoimmune conditions.

Possible causes of leaky gut include excess use of irritants such as alcohol, aspirin, non-steroidal anti-inflammatory drugs (NSAIDs) such as ibuprofen, gluten, food sensitivities, imbalance of gut bacteria, stress, and endurance exercise.

Some experts propose that altering the diet may reverse leaky gut in some circumstances, but that this is not a 'cure' for inflammatory or ulcerative conditions because leaky gut may be a symptom rather than a cause of the disease.

The NHS' position is cautious, stating on its website: "While it's true that some conditions and medications can cause a "leaky" gut (what scientists call increased intestinal permeability), there is currently little evidence to support the theory that a porous bowel is the direct cause of any significant, widespread problems."

Meanwhile, a 2020 study on mice reported that leaky gut caused by excessive fructose consumption, commonly found in sugary drinks, could contribute to non-alcoholic fatty liver disease (NAFLD). The study found that excessive fructose reduced production of proteins that maintain the gut barrier and led to gut permeability.

The study's first author said that by "deteriorating the barrier and increasing its permeability, excessive fructose consumption can result in a chronic inflammatory condition called endotoxaemia, which has been documented in both experimental animals and paediatric NAFLD patients." The study found endotoxins (harmful molecules) reaching the liver provoked increased inflammation.[7] Another 2020 study found that participants with endotoxins in their blood, which are markers of leaky gut, had poorer concentration after eating.[8]