

Although both considered healthy snacks, oranges are lower in FODMAPs than apples.

DIET

Food for thought

Many people with irritable bowel syndrome feel that they benefit from dietary interventions, but researchers still lack a full understanding of how food can inflame this disorder.

BY SARAH DEWEERTD

There is no doubt that people with irritable bowel syndrome (IBS) and the doctors who treat them are obsessed with diet. The past five years have seen a huge rise in awareness of the low-FODMAP diet, which omits particular carbohydrates found in wheat, onions and some fruits. Other patients are eager to go gluten free, eschewing a protein that is found in wheat and some other grains — a diet that is also popular outside the IBS community. “Patients have high expectations” for such diets, says Magnus Simrén, a gastroenterologist at the University of Gothenburg in Sweden.

The idea that food causes IBS symptoms has intuitive appeal to many. In surveys, 40–90% of people with IBS say that their symptoms have dietary triggers. “Patients have been telling us

for many, many years that their symptoms are associated with eating a meal,” says William Chey, a gastroenterologist at the University of Michigan in Ann Arbor. These people have historically had few options for reliable pharmaceutical treatments.

But we have been down this road before, and earlier interest in dietary interventions for IBS failed to have a lasting effect on patients’ symptoms. Even now, many scientists caution that we do not know enough about the relationship between food and IBS. And although low-FODMAP and gluten-free diets are gaining traction, researchers say that a more rigorous, sceptical attitude is needed to ensure that the current interest in diet leads to lasting clinical gains.

Forty years ago, the prevailing theory on IBS was that symptoms were triggered by food

intolerance or allergies. In the early 1980s, John Hunter, a gastroenterologist at Addenbrooke’s Hospital in Cambridge, UK, reported success with a diet that excluded most common food allergens, including those found in milk, eggs and nuts.

This approach hit a dead end, however, when other clinics had difficulty replicating Hunter’s results. Furthermore, numerous studies found that people with IBS had no higher prevalence of food allergies than the general population. By the 1990s, diet had largely been abandoned as a treatment for IBS, with the focus switching instead to pharmaceutical therapies.

But in the past decade, the pendulum has swung back, pushed both by patients’ frustration with underwhelming drugs and by new research tools for investigating dietary triggers of symptoms. “We have a much better understanding now of all the different ways in which food might cause gastrointestinal problems,” Chey says.

FOOD TRIGGERS

Working out which foods are implicated in causing IBS symptoms — let alone which ones trouble an individual patient — is tricky, however. “Food contains all sorts of different components,” says Kevin Whelan, a dietitian at King’s College London. Any individual food item is chemically complex, he says — and foods are rarely eaten in isolation.

But researchers got a big break in the late 2000s. A team at Monash University in Melbourne, Australia, led by gastroenterologist Peter Gibson and dietitian Sue Shepherd, conducted some of the most rigorous studies yet of the dietary triggers of IBS. Their work centred on FODMAPs (fermentable oligosaccharides, disaccharides, monosaccharides and polyols), which are carbohydrates that the body has difficulty breaking down or absorbing. They include: fructose, the form of sugar found in fruit; lactose, which is found in milk; fructans, which are polymers of fructose found in wheat, legumes and onions; and alcohol (see ‘FODMAP food map’).

Many FODMAPs had previously been implicated in IBS. “We’ve known that they cause problems,” says Gibson. “But no one had ever put them together as a family that all have the same effect.”

In one persuasive study¹, Gibson’s team put people with IBS on a diet that drastically reduced their consumption of FODMAPs. Their symptoms improved. Then the researchers fed them fructose, fructans or a placebo. Symptoms returned in people given FODMAPs, but not in those who received the placebo. “They really have shown that FODMAPs can induce symptoms in patients with IBS,” says Simrén.

Magnetic resonance imaging (MRI) studies of the digestive system have shown how FODMAPs cause problems. Poorly absorbed molecules such as fructose draw more water

into the small intestine, stretching it. Poorly digested FODMAPs, such as fructans, are fermented by gut bacteria, producing excess gas in the large intestine. These effects also occur in people without IBS, but the condition is also associated with visceral hypersensitivity, so even a small distension of the intestine can be painful.

In addition, in some people with IBS, food passes through the gut more quickly than normal. In these individuals, any excess water drawn into the small intestine will not have time to be reabsorbed in the large intestine, resulting in diarrhoea. "A significant proportion of people with IBS will benefit from reducing their FODMAP intake," says Whelan. He and other proponents of the low-FODMAP diet say that it can help up to 70% of people with IBS.

HIT THE FLAW

Not everyone is convinced, however. Some researchers argue that many of the studies purporting to show the benefits of a low-FODMAP diet have methodological flaws — difficulties that are commonly found in dietary studies.

The main problem is that people are aware of what they are eating, which means that unlike in studies of experimental drugs, it is difficult to blind participants to whether they are in the treatment or control group. This makes these studies more vulnerable to both placebo and nocebo effects (in a nocebo effect, the thought of eating a trigger food could bring on negative symptoms). "Expectations play a big role here," Simrén says.

To address this problem, Simrén's team tried to take expectations out of the equation. In 2015, they published a study² of 75 patients who were randomly assigned to follow either a low-FODMAP diet or conventional dietary advice for IBS, which focuses on avoiding large meals, fat, insoluble fibre, caffeine and gas-producing foods such as beans. Patients were told that both diets had a good chance of helping them but, crucially, the researchers never used the term 'FODMAP'. This was the largest randomized trial of the low-FODMAP diet, and the first to directly compare it with another active intervention.

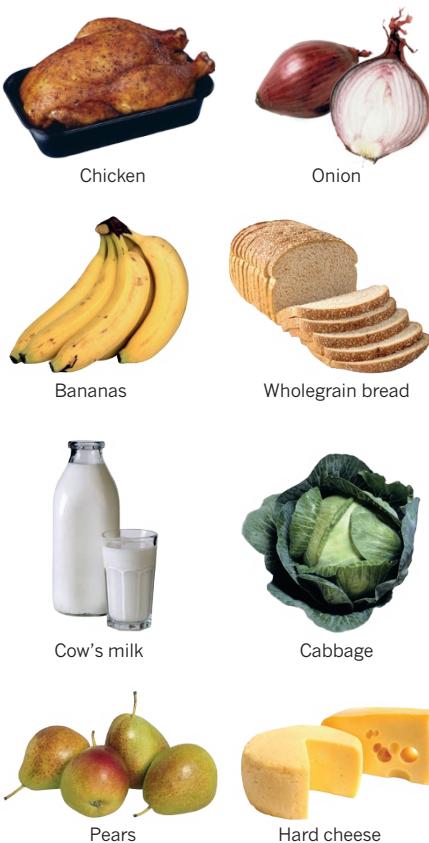
After four weeks, there was no difference between the groups — about half of the people on each diet reported improvement in their symptoms. The researchers concluded that the low-FODMAP diet was as effective for IBS as the established diet. But Paul Moayyedi, a gastroenterologist at McMaster University in Hamilton, Canada, calls the results "completely negative", as the low-FODMAP diet offered no advantage over previous dietary advice.

Such disagreement about how to interpret dietary studies is common in the IBS community. "This is evidence that you actually have dietetic interventions that work," says gastroenterologist David Sanders of Sheffield Teaching

CLOCKWISE FROM TOP LEFT: BRAND X/MARS; PHOTONALTO/MARS; COLLECTION:WHITEWISH/ISTOCK/GETTY; GETTY/MARS; OLGA POPOVA/ISTOCKPHOTO/THINKSTOCK/GETTY/MARS; COMSTOCK/MARS; GETTY/MARS

FODMAP FOOD MAP

Some of these foods are prohibited on a diet that is low in the indigestible carbohydrates known as FODMAPs, but which ones? (Answer in the margin.)



"A low-FODMAP diet is not a diet for life."

Hospital in the United Kingdom. Both the low-FODMAP diet and the conventional IBS diet give a 50% chance of improvement without using drugs — and keep the patient in control. "It's wonderful, isn't it, to have that?" he asks.

But proponents and sceptics do agree that the low-FODMAP diet should be supervised by a health-care professional. Without proper advice, patients who give up high-FODMAP, but otherwise healthy foods, such as apples, artichokes and lentils, may struggle to have adequate fibre, vitamins and minerals in their diet. And some FODMAPs also encourage the growth of beneficial bacteria.

"The low-FODMAP diet removes important prebiotics from the diet and has the potential to cause really quite large perturbations in the balance of the gut microbiome," says Miranda Lomer, a dietician at King's College London who collaborates with Whelan.

For these reasons, avoiding all FODMAPs should only be a short-term undertaking. "A low-FODMAP diet is not a diet for life," says Gibson. And it should not be adopted lightly. But the proliferation of dietary information on the Internet means that, in practice, this does not always happen.

Peter Whorwell, a gastroenterologist at the University of Manchester, UK, estimates that half of his patients have put themselves on a

low-FODMAP diet without taking medical advice. "That is quite worrying," he says (see page S112).

DIET DILEMMA

Low-FODMAP is not the only diet of interest to the IBS community. To try to relieve their symptoms, many people with IBS go gluten free — some studies have shown this to be effective in up to 70% of individuals with IBS.

But the role of gluten in IBS is unclear, and most 'gluten-free' diets are really wheat-free diets, so the culprit could be other compounds found in wheat. Some studies point to α -amylase trypsin inhibitors, or say that people may be benefiting from reduced consumption of insoluble fibre, which is common in whole-grain breads and other cereal products. In 1994, Whorwell found that fibre worsened IBS symptoms in more than half of patients. He suspects that fibre causes problems through similar mechanisms to FODMAPs, being fermented by gas-producing bacteria in the colon.

Or maybe it's all down to FODMAPs. Wheat contains fructans and is one of the most frequently eaten FODMAP-containing foods. In one study³, Gibson's team cycled people with IBS through periods on low-FODMAP, low-gluten and high-gluten diets. Their symptoms diminished only during the low-FODMAP phase. "We could find no evidence of any specific response to gluten," he says.

Whatever the reason for its success, the wider popularity of the gluten-free diet, particularly in the United States and Australia, makes it clinically appealing. "It's easier to buy gluten free, it's less of a restrictive diet, and it doesn't require as much dietetic support," says Sanders. He adds that some of his patients who improve on a low-FODMAP diet eventually go gluten free instead because it's easier.

Eventually, scientists hope to identify biomarkers in the blood or the gut microbiota, or possibly both, to determine which dietary factors a particular patient is sensitive to, and what dietary changes might ease their symptoms. But such an analysis is probably years away. In the meantime, those who treat IBS tend towards pragmatism. Even Moayyedi, who is sceptical of the low-FODMAP diet, recommends that some of his patients give it a go. He says that it helps about one-quarter of the time.

Simrén says that despite little being known about the effects of gluten, he does not argue when patients say that gluten-free diets help. "I tell them, 'I don't quite know why you are better, but I'm happy that you are,'" he says. "And if you feel that much better, you can continue." ■

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