



Understanding **FODMAPs**

What are FODMAPs?

FODMAPs are a group of small carbohydrate (sugar) molecules found in everyday foods. Carbohydrates are made up of carbon, hydrogen and oxygen and provide an important source of energy for the body. FODMAPs are carbohydrates that may be poorly absorbed in the small intestine of some people. FODMAPs move through the digestive tract to the large intestine (colon), where they can draw water into the colon and are rapidly fermented

(digested) by naturally-occurring gut bacteria. The fermentation of FODMAPs produces gas and other by-products.

While some people are able to consume FODMAPs without experiencing gastrointestinal side effects, many people with digestive disorders, such as Irritable Bowel Syndrome (IBS), find that FODMAPs triggers symptoms including abdominal pain, cramping, bloating, excess gas, constipation and/or diarrhea.

What does FODMAP mean?

FODMAP is an acronym for Fermentable – Oligosaccharides – Disaccharides – Monosaccharides – And – Polyols. Each of these is explained below:

F	Fermentable: Fermentable carbohydrates are sugars that are broken down and digested by bacteria in our intestines, producing gas and other by-products.
O	Oligosaccharides: Oligosaccharides are short chains of carbohydrate molecules linked together. <ul style="list-style-type: none"> • Fructans (a chain of fructose molecules) and galacto-oligosaccharides (a chain of galactose molecules) are oligosaccharides that humans cannot break down and properly absorb in the small intestine.
D	Disaccharides: Disaccharides are two carbohydrate molecules linked together. <ul style="list-style-type: none"> • Lactose, the sugar found in milk and dairy products, is a disaccharide composed of glucose and galactose. Lactose must be broken down by the digestive enzyme lactase before it can be absorbed in the small intestine. In people with lactose intolerance, the level of lactase enzyme is insufficient to properly digest lactose and lactose travels to the colon where fermentation occurs.
M	Monosaccharides: Monosaccharides are single carbohydrate molecules. <ul style="list-style-type: none"> • Fructose, the sugar found in many fruits and some vegetables, is a monosaccharide and does not require any digestion before it is absorbed. When foods containing equal amounts of fructose and glucose are eaten, glucose helps fructose to be completely absorbed. However, when fructose is present in greater quantities than glucose, fructose absorption depends upon the activity of sugar transporters located in the intestinal wall. The ability to absorb excess fructose varies from person to person. In people with fructose malabsorption, the capacity of sugar transporters is limited and excess fructose travels to the colon where fermentation occurs.
A	And
P	Polyols: Polyols, or sugar alcohols, are a type of carbohydrate that humans can only partially digest and absorb in the small intestine. <ul style="list-style-type: none"> • Polyols, such as sorbitol, mannitol, xylitol, maltitol and isomalt, mimic the sweetness of sucrose (table sugar), however, because their absorption is much slower, only a small amount of what is eaten is actually absorbed. Polyols are often used as low-calorie sweeteners in sugar-free and diet products.

FODMAPs

How do FODMAPs affect people with digestive disorders?

Although FODMAPs are not the cause of digestive disorders such as IBS, they can trigger gastrointestinal symptoms. When FODMAPs reach the colon, they draw fluid into the bowel and bacteria ferment the FODMAP molecules to produce hydrogen and methane gases. The liquid and gas distend (stretch) the intestine and signal nerves surrounding the digestive organs.

For many people with IBS, the nerves of the gut are unusually sensitive and even a small change in the intestinal volume can cause the nerve network to overreact and trigger IBS symptoms.

What foods contain FODMAPs?

FODMAPs are found in a wide variety of everyday foods including fruits, vegetables, legumes, milk products and sweetening agents. Each person has an individual threshold for tolerating FODMAPs and some foods may pose more of a problem than others. A diet that reduces the intake of high FODMAP foods (shown in Table 1) and manages the total FODMAP load at each meal, may help to improve gastrointestinal symptoms for some people.

Table 1: HIGH FODMAP FOODS

FRUCTANS	GALACTO- OLIGO- SACCHARIDES	LACTOSE	EXCESS FRUCTOSE	POLYOLS
Vegetables artichokes, asparagus, beetroot, chicory, dandelion leaves, garlic, leek, onions, onion and garlic salt or powders, radicchio lettuce, spring onions (white part)	Legumes baked beans, bortolotti beans, kidney beans, chickpeas, lentils, soybeans, soy flour and some soy milk	Milk Products milk (cow, goat or sheep), custard, condensed and evaporated milk, dairy desserts, ice cream, margarine, powdered milk, yogurt	Fruits apples, boysenberries, figs, mangoes, pears, watermelon Sweeteners agave, corn syrup solids, high-fructose corn syrup, honey	Fruits apples, apricots, blackberries, cherries, longons, lychees, nectarines, peaches, pears, plums, prunes Vegetables avocados, cauliflower, green pepper, mushrooms, pumpkin, snow peas
Grains barley, rye or wheat (in large amounts), fructo-oligosaccharides, inulin		Cheese soft and unripened cheese (ricotta, cottage, cream, mascarpone)	Alcohol Rum	Sweeteners sorbitol (420), mannitol (421), isomalt (953), maltitol (965), xylitol (967)
Nuts cashews, pistachios				

Adapted from sources: Dr. Sue Shepherd, 2012 Shepherd Works <http://shepherdworks.com.au>
 Kate Scarlata, Registered Dietitian <http://blog.katescarlata.com/fodmaps-basics/fodmaps-checklist/>

High FODMAP foods can be replaced with choices from the low FODMAP foods list (shown in Table 2) to help maintain a nutritious and well-balanced diet.

Table 2: LOW FODMAP FOODS

FRUCTANS	GALACTO-OLIGO- SACCHARIDES	LACTOSE	EXCESS FRUCTOSE	POLYOLS
Vegetables bok choy, bean sprouts, bell peppers, butter lettuce, carrots, celery, chives, corn, eggplant, green beans, tomatoes, potatoes, spinach Garlic or onion-infused oil Gluten-free* breads/cereals, rice and corn pasta, rice cakes, potato chips, tortilla chips	Legumes firm tofu	Milk Products lactose-free milk and lactose-free milk products including cottage cheese, ice cream and sorbet Cheese certain cheeses such as cheddar, parmesan, swiss, mozzarella	Fruits ripe bananas, blueberries, grapefruit, grapes, honeydew, lemons, limes, passion fruit, raspberries, strawberries, tangelos Sweeteners table sugar, maple syrup	Fruits bananas, blueberries, grapefruit, grapes, honeydew, kiwi, lemons, limes, oranges, passion fruit, raspberries Sweeteners table sugar, glucose, aspartame

* Examine ingredients on gluten-free breads and cereals to ensure other FODMAPs such as honey and agave are not present.
 Adapted from source: Kate Scarlata, Registered Dietitian <http://blog.katescarlata.com/fodmaps-basics/fodmaps-checklist/>

Does reducing FODMAP intake relieve digestive symptoms?

The low FODMAP diet, originally developed in Australia by dietitian, Dr. Sue Shepherd, and gastroenterologist, Dr. Peter Gibson, is increasingly recognized as an effective dietary treatment for IBS. An Australian study has shown that a low FODMAP diet may reduce gastrointestinal symptoms in 75% of IBS patients.¹ The low FODMAP diet is intended for people with functional bowel disorders, such as IBS, and may provide no benefit for healthy individuals.

Who should follow a low FODMAP diet?

If you experience any of the symptoms commonly associated with IBS, consult your physician. In addition to other treatments your doctor may recommend, following a low FODMAP diet may be an effective strategy to ease the pain, gas and altered bowel patterns commonly experienced in IBS.

When reducing FODMAPs in the diet, it is important to replace restricted foods with nutritious alternatives and ensure that your diet is healthy and well-balanced. A re-introduction of FODMAP foods should be done gradually to help identify which FODMAPs can be tolerated over the long term.

The low FODMAP diet is best implemented under the supervision of a qualified health care professional, such as a registered dietitian. This diet is a new and evolving area of nutritional science. Additional research into the role of FODMAPs in IBS and the FODMAP content of specific foods is continually emerging. We encourage you to seek additional sources that are supported by recent scientific evidence.

1. Gibson, P. R., & Shepherd, S. J. (2010). Evidence-based dietary management of functional gastrointestinal symptoms: The FODMAP approach. *Journal of Gastroenterology and Hepatology*, 25, 252-258. Click <<http://onlinelibrary.wiley.com/doi/10.1111/j.1440-1746.2009.06149.x#abstract>>

Partnering for best health.

Working collaboratively with your health care professional will help you protect your body from digestive diseases and maximize your digestive health. When you report your health status completely, concisely and accurately, your physician can provide you with the best care and treatment plan. Be sure to stay informed on ways to maintain your health and well-being, track and record your symptoms, and write down questions and concerns to discuss at your next appointment.

Learning more about digestive health.

The Canadian Digestive Health Foundation provides information, tools and support to help you take control of your digestive health with confidence and optimism. Visit www.cdhf.ca to view on-line seminars, personal stories and helpful resources about digestive disorders including IBS, diarrhea and constipation.

Videos and presentations about IBS are available at:

<http://www.cdhf.ca/digestive-disorders/ibs-living.shtml>

- **Understanding Irritable Bowel Syndrome...**

- **Let's Talk**

- This video features interviews and comments from physicians and patients

- **More than Gas and Bloating. IBS – the Mind-Gut Connection**

- This on-line seminar, presented by Dr. Stephen Vanner, provides an in-depth overview of IBS, symptoms, possible causes and suggested treatments.

- **IBS with Dr. Adam Weizman**

- This public presentation provides an overview of IBS.

Please note: The information contained in this fact sheet is not a substitute for medical care and the advice of your physician. There may be variations in treatment that your physician may recommend based on your individual facts and circumstances. Always consult with your physician when you have concerns about your health.

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- Please send me information about protecting and improving my digestive health.

Over 20 million Canadians suffer from digestive disorders every year. The Canadian Digestive Health Foundation believes this is unnecessary and unacceptable.

We reduce suffering and improve quality of life by empowering Canadians with trusted, up to date, science-based information about digestive health and disease.

As the Foundation of the Canadian Association of Gastroenterology, we work directly with leading physicians, scientists, and other health care professionals to help you understand and take control of your digestive health with confidence and optimism.

Through research and public education, we aim to:

 **REDUCE**
the incidence and prevalence of digestive disorders

 **IMPROVE**
understanding of digestive health issues

 **SUPPORT**
those suffering from digestive disorders

 **ENHANCE**
quality of life for those living with digestive disorders

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The Canadian Digestive Health Foundation is a national charity governed by a volunteer board of directors. We rely on donations from the public and the generosity of our partners to develop and deliver our programs. Please consider including our Foundation as one of your chosen charities.

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