

Fructose in foods

Foods high in fructose and fructans include many fruits, berries, honey, some vegetables and cereal products. In some countries fructose is commonly used as a sweetener in snacks and soft drinks, e.g. in the form of high fructose corn syrup (HFCS). Many healthy foods contain fructose or fructans and it is important to maintain a healthy diet despite the reduction in fructose necessitated by a fructose intolerance. Vitamin supplements are often useful, if the fructose intolerance is severe or in case of a hereditary fructose intolerance (HFI), where very strict exclusion of fructose and sucrose is required. Individuals with HFI also need to avoid the newer sweeteners, such as tagatose and isomaltose (read labels). Tagatose is metabolized similarly to fructose and isomaltose is made up of fructose and glucose. These two sweeteners may be found in: beverages (soft drinks, instant drink preparations, teas, fruit or vegetable juices / drinks), breakfast cereals and cereal bars, confectionery and chewing gum, fondants and fillings, jams and marmalades, and diet foods. Levulose and invert sugar on food labels signifies fructose content.

Recent literature shows a diet with generally reduced FODMAP content may be the most effective and practicable diet to aim for. The following information will give you details on how to specifically reduce fructose in your diet.

- Fructose is better tolerated in the presence of glucose. This means food containing at least as much glucose at fructose is often well tolerated (in the tables this is the F/G value, which should be smaller than 1).
- Irrespective of glucose content, some foods naturally contain a high load of fructose, i.e. over 3g per serving, or of fructans, i.e. over 0.5g/serving.

These are the two criteria considered most useful in the selection of food to avoid. See below for the food table and links to more extensive food tables.

Based on these criteria, the following foods are likely to be poorly tolerated and should be avoided.

- Fruit and fruit juices: apple, cherry, grape, guava, litchi, mango, melon (honeydew and watermelon), orange, papaya, pear, persimmon, pineapple, quince, star fruit. Cooked fruit generally has lower fructose content than uncooked fruit.
- Most dried fruit, including currant, dates, dried fruit or health bars, fig, raisin.
- Processed fruit: barbecue / braai sauce, chutney, fruit from cans / tins (often in pear juice), plum sauce, sweet and sour sauce, tomato paste.
- Berries in larger quantities: blueberry, raspberry.
- Sweets, food and drinks with very high sucrose (table sugar) content and with high fructose corn syrup (HFCS).
- Honey, maple syrup.
- Vegetables in larger quantities (fructan content): artichoke, asparagus, beans, broccoli, cabbage, chicory, leek, onion, peanuts, tomato, zucchini.
- Sweet wines: e.g. dessert wines, muscatel, port, sherry.
- Wheat-based products: flour, pasta, bread, whole-grain breakfast cereals.
- Whole-meal products in large amounts.
- Sorbitol (E420 is sorbitol) and xylitol (E967 is xylitol) containing foods: diet / 'light' and diabetic drinks, sugar-free chewing gum and sweets / candies, stone fruit, dried fruits (e.g. apple, apricot, date, fig, nectarine, peach, plum, raisin). Beer may be a problem in large amounts.
- Inulin, a fructan (see [Fructose and fructan intolerance](#)), content is high in the following foods generally known to cause bloating and gas: Asparagus, dandelion leaves, garlic, leeks, onion and wheat bran.

Examples of generally well-tolerated fruit and vegetables are:

- Aubergine, banana, Brussels sprouts, carrots, clementine / mandarin, corn, cucumber, fennel, grapefruit, lemon, potato, pumpkin, radishes, red currants, rhubarb, sauerkraut, spinach and sweet potato / yam.

The table below shows the fructose and glucose content, as well as the fructose / glucose ratio of common foods. The figures are rounded, hence the discrepancies between F, G and F/G. General guidelines are:

First step: observe F/G value, which should be smaller than 1.

Second step: absolute fructose content of food product should not be over 3g per serving. Small portions of borderline foods can be tried, especially when your stomach is not empty.

Foods outside of these suggested ranges are shown in bold in the table. See links below for more extensive food lists.

Content in gram / 100g product			
	Fructose (F)	Glucose (G)	Ratio F / G
Dried fruit:			
Apple	29	10	2.9
Date	25	25	1.0
Fig	24	26	0.9
Plum	9	16	0.6
Raisin	32	31	1.0
Apple, fresh	6	2	2.8
Apple, juice	6	2	2.7
Apple, sauce	8	4	1.8
Apple, jam / jelly	27	26	1.0
Peach, fresh	1	1	1.2
Peach, can	4	4	0.9
Grapes, fresh	7	7	1
Grape, juice	8	8	1
Berries			
Blackberries, fresh	3	3	1.1
Blackberries, jam	20	22	0.9
Blueberries, can	2	2	1.4
Blueberries, fresh	3	2	1.4
Blueberry, jam	20	22	0.9
Cranberries, can	21	21	1
Cranberries, fresh	3	3	1
Cranberry, jam	20	22	0.9
Currants, black fresh	3	3	1
Currants, red fresh	2	2	1.2
Gooseberry, fresh	3	3	1.1
Raspberries, can	7	6	1
Raspberry, jam	14	17	0.8
Raspberries, fresh	2	2	1.2
Strawberry, jam	19	22	0.9
Strawberry, fresh	2	2	1.1
Honey	39	34	1.1
Cherry, jam	22	28	0.8
Orange	3	2	1.1
Orange, juice fresh	3	3	1.2
Orange, marmalade	15	17	0.9
Star fruit	8	7	1.1
Rose hip	7	7	1
Cherries, sweet	6	7	0.9
Cherries, sour	4	5	0.8
Pineapple, can	5	5	1
Pineapple, juice	3	3	1
Pineapple, fresh	2	2	1.2
Kiwi	5	4	1.1
Grapefruit, juice fresh	2	2	1

Grapefruit, fresh	2	2	0.9
Melon, honey	1	1	2.1
Melon, water	4	2	2
Banana	3	4	1
Litchi	3	5	0.6
Mandarins, juice	3	2	2
Mandarins, fresh	1	2	0.8
Mango, fresh	3	1	3.1
Plum, fresh	2	3	0.6
Artichoke	2	1	2.3
Tomato, juice	2	1	1.3
Tomato, fresh	1	1	1.3
Turnip	2	2	0.8
Lemon	1	1	1
Lemon, juice	1	1	1
Pumpkin	1	2	0.9
Beans, green	1	1	1.4
Carrots	1	1	0.9
Cabbage	1	2 – 0.6	0.8 – 1.5
Leeks	1	1	1.3
Bread, rye whole meal	1	1	1.5
Fennel	1	1	0.8
Broccoli	1	1	1.1
Eggplant / aubergine	1	1	1
Zucchini	1	1	1.1
Cucumber	1	1	1
Asparagus	1	1	1.2
Okra	1	1	1.1
Potato	0.2	0.2	0.7
Potato, sweet	0.7	0.8	0.8
Papaya	0.3	1	0.3
Salad	0.2	0.4	0.6
Spinach	0.1	0.1	0.9
Mushrooms	0.1 – 0.3	0.1 – 0.3	0.7 - 0.9
Salad	0.2	0.4	0.6

Other Important information

- **Non-carbohydrate sweeteners:** aspartame, acesulfame K, saccharin, cyclamate, thaumatin are no problem for HFI or fructose intolerant individuals.
- Sorbitol decreases and glucose increase fructose tolerance. Glucose (e.g. glucose / dextrose containing tablets, drinks, syrup) can be eaten together with fructose-containing foods to increase tolerability.
- Fructose-containing foods are better tolerated in several smaller servings throughout the day and not on an empty stomach.
- Fructose intolerant individuals may also be lactose intolerant. They are likely to benefit most from a general reduction of FODMAPs.

Source: <http://www.foodintolerances.com.au/downloads/fructose-food-table.aspx> accessed 24/10/2012