



Low Fructose Diet

What is Fructose?

Fructose is a sugar found naturally in three forms: free fructose, as a disaccharide in sucrose (table sugar) and as chains of fructose units called fructans. Dietary Fructose Intolerance can occur in anyone and is identified by special breath testing. If you are one of those people who are fructose intolerant, ingesting fructose could cause intestinal problems such as gas, bloating, abdominal cramping and diarrhea.

Glucose is another type of naturally occurring sugar that helps your body absorb fructose. Foods that contain glucose in amounts equal to or greater than fructose are usually well tolerated and absorbed.

The following guidelines are provided to help relieve symptoms. Use products that contain fructose in moderation. It is not necessary to exclude all foods that contain fructose.

General Guidelines

- Avoid products with ingredients that list fructose, high fructose corn syrup, (HFCS), honey, fruit juice concentrate and/or corn syrup solids, among the first 5 ingredients on the food label.
- Avoid sugar alcohols which include sorbitol, isomalt, lactitol, maltitol, mannitol, xylitol, erythritol and hydrogenated starch hydrolysates. These are often found in “sugar free” and “no sugar added” gum, candy, ice cream, cookies and cough medicines/drops. Sugar alcohols are not well absorbed and create a laxative effect in the intestinal tract. Their absorption is not accelerated by consuming them with glucose.
- Sucrose (table sugar or granulated sugar) contains fructose. However, since sucrose contains 50% fructose and 50% glucose, it can be eaten in reasonable amounts.
- Keep your fructose intake to a minimum (0-5 grams/day) for six weeks.
- After that, reintroduce fructose (5-15 grams/day) based on your personal tolerance. Make your food choices as varied as possible and eventually consume a level of fructose based on your ability to minimize your intestinal problems (generally 15-20 grams/day)
- Keeping a food and symptom diary can be helpful to identify the amounts and kinds of food that are tolerated and to adjust your diet to prevent problems.
- Check medications for fructose or sorbitol. They are not always listed on the label, so check with your pharmacist or the manufacturer.

Fructose Content of Fruits

Those items in **bold** contain glucose in amounts equal to or greater than fructose.

Items with a ^ symbol contain fructans (chains of fructose). Fructans can trigger intestinal problems.

Low Fructose (0- 0.5 gm)

Avocado, 1 each

Lime, 1 each

Apricot, 1 each

Lemon, 1 each

Rhubarb, 1 cup, diced

Moderate Fructose (0.51-1 gm)

Cranberries, 1 cup, diced

Cantaloupe, 1/4 cup

^Pineapple, 1/4 cup, fresh

Nectarine, small, 1/2 each

Strawberries, 1/4 cup, fresh

^Peach, small, 1/2 each

High Fructose (1.01-2 gm)

Grapefruit, small, 1/2 each

^Pineapple, 1/2 cup, fresh

^Peach, small, 1 each

Strawberries, 1/2 cup, fresh

Raspberries, 1/2 cup, fresh

Date, 1 each

Fig, 1 each, fresh

Nectarine, small, 1 each

Plum, small, 1 each

Very High Fructose (2.01 + gm)

Cherries, 5 each

Blueberries, 1/2 cup, fresh

Blackberries, 1/2 cup, fresh

Cantaloupe, 1 cup, diced

Orange, small, 1 each

Kiwi, 1 each

Raisins, 0.5 oz. box

Honeydew, 1 cup, diced

^Watermelon, 1 cup, diced

Banana, small, 1 each

Apple, small, 1 each

Fruit Cocktail, light, 1/2 cup

Pear, small, 1 each

Grapes, 10

Prunes, 1 each

^Mango, 1 cup, diced

Star fruit, 1 each

Guava, 1 cup, diced

Papaya, 1 cup, diced

^Persimmon, 1 each

Pomegranate, 1, raw

Fructose Content of Vegetables

Those items in **bold** contain glucose in amounts equal to or greater than fructose. Items with a ^ symbol contain fructans (chains of fructose). Fructans can trigger intestinal problems. Items with a * symbol contain galactans (chains of galactose). Galactans can trigger intestinal problems.

Low Fructose (0- 0.5 gm)

Spinach, 1 cup, fresh
Radish, large, 1 each
Beets, 1/2 cup, sliced
Peas, 1/2 cup, cooked
Mushrooms, 1 cup, fresh
^Onion, 1 Tbsp., chopped
Pepper (green), 1 Tbsp., raw
Celery, 1 stalk
Okra, 1/2 cup
Corn, 1/2 cup, cooked
*Green beans, 1/2 cup, canned
Lettuce, Romaine, 1 cup, chopped
Sweet corn, 1 small ear, boiled
Baby carrots, 3 each
Sweet potato, 1/2 cup, baked

Moderate Fructose (0.51-1 gm)

^Asparagus, 1/2 cup cooked
Lettuce (iceberg), 1 cup, chopped
*Green Beans, 1/2 cup, frozen
*Cabbage (green), 1 cup, raw, shredded
Carrots, 1/2 cup, cooked, sliced
Cauliflower, 1 cup, fresh

^Artichoke, 1 each, fresh

*Brussels sprouts, 1/2 cup, fresh
Cucumber, 1 cup, fresh, sliced
Baked potato (russet), large, 1 each
^Zucchini, 1/2 cup
Pepper (green), 1/2 cup, fresh, chopped
Eggplant, 1/2 cup, fresh, sliced

High Fructose (1.01-2 gm)

*Broccoli, 1 spear
Summer squash, 1 cup, raw
Baked potato (red), large, 1 each
Tomato, small, 1 each
Squash (butternut), 1 cup, raw, cubed
*Cabbage (red), 1 cup, raw, shredded
Tomato paste, 1/2 cup
Tomato, 1/2 cup, cooked
^Leek, 1, raw

Very High Fructose (2.01 + gm)

Tomato sauce, 1/2 cup
Tomato juice, 1/2 cup
Tomato, large, 1 each
Pepper (red), large, 1 each

Grains

- Wheat contains fructans and can cause intestinal problems when it is the main ingredient in a product. Do not be concerned with wheat-derived ingredients such as wheat thickener, maltodextrin and dextrose as these contain negligible amounts of fructans.
- Choose cornmeal, barley, buckwheat, rice, rye and products made from these grains.
- **Breads:** cornbread, wheat free rye bread, gluten free bread, corn tortillas
- **Crackers:** rye, rice and corn crisp breads and crackers, gluten free crackers
- **Cereals:** rice, grits, oatmeal, corn flakes, puffed rice, gluten free cereal
- **Pasta:** rice noodles, soba (100% buckwheat) noodles, gluten free pasta, rice
- **Breadcrumbs:** cornflake and gluten free rice crumbs

Meats and Meat Substitutes

- Choose meats, poultry, fish and eggs prepared without breading made from wheat or sweetened sauces such as sweet and sour sauce, relish, tomato paste, chutney, plum sauce and BBQ sauce.
- Read labels closely on processed meat (lunch meats, brats, hot dogs, etc.)
- Limit legumes (baked beans, kidney beans, lentils, black eye peas and beans, borlotti beans, chickpeas, butter beans) and soy-based products as they contain galactans. Galactans are chains of the sugar galactose. The human body lacks the enzymes to digest and absorb galactans. Galactans can cause GI symptoms.

Milk and Milk Substitutes

- Choose milk, cheese, cottage cheese and yogurt without added fruit, sweeteners made from fruit juice concentrate or high fructose corn syrup.

Fats and Oils

- Vegetable oils, margarine and butter are tolerated.
- Limit commercial salad dressings, low fat dressings made with fructose, fruit juice concentrate or high fructose corn syrup.

Desserts

- Choose wheat free cakes, cookies, cake doughnuts, ice cream, muffins sweetened with sucrose (table sugar), without added fruit or fruit juice concentrate.
- Choose sherbet or sorbet made with fruits low in fructose such as lemon or lime.
- Limit dried fruit bars, baked products made with dried fruit and fruit juice concentrate, sorbet made with watermelon, fruit pies made with fruits very high in fructose.
- Limit ice cream with added inulin or chicory root as they are fructans.

Beverages

- Choose water, carbonated water, milk, coffee, tea, diet soda, glucose-sweetened sports or energy drinks (examples: Gatorade G2®, Powerade Zero® and Propel Zero®), alcoholic beverages (limit to 1 ounce):gin, rum, vodka (from grain or potato), whiskey, dry white wine, or red wine, powdered drinks, sugar-free (or with allowed sweetener) and pure cranberry juice (sweetened with allowed sweeteners).
- Limit beer and fortified wines: sherry, port.
- Limit all beverages, soft drinks, bottled teas and coffees with fructose, HFCS or sorbitol.
- Limit sport drinks made with fructose or HFCS.
- Limit all fruit juices except pure cranberry juice (sweetened with allowed sweeteners).
- Limit coconut milk or cream.
- Limit chicory-based coffee-substitute beverages.

Sweeteners

Generally Tolerated Sweeteners

- Baker's sugar
- Bar sugar
- Barley malt syrup
- Beet sugar
- Berry sugar
- Brown sugar and brown sugar syrup
- Brown rice syrup
- Cane sugar
- Castor sugar
- Confectioners' sugar
- Corn sugar
- Corn syrup
- Demerara
- Dextrin (corn sugar)
- Dextrose/glucose
- Dextroglucose
- Evaporated cane sugar
- Evaporated cane juice
- Glucose
- Glucose syrup
- Glycogen
- Invert sugar
- Isomaltose
- Lactose
- Maltodextrin (a form of glucose)
- Maltose
- Maple sugar
- Maple syrup
- Moducal
- Polincillo
- Polycose
- Polydextrin
- Raw Sugar
- Reducing sugar
- Saccharose
- Starch sugar
- Sucanat
- Sucrose (cane or beet sugar, table sugar)
- Sugar
- Sugar cane juice
- Sugar substitutes
 - Aspartame (Equal®, NutraSweet®, NatraTaste®)
 - Saccharin (Sweet 'n Low®, SUGARTWIN® white and brown)
 - Acesulfame Potassium
 - Sucralose (Splenda®)

• Turbinado Sweeteners to Limit / Avoid

- Agave syrup
- Barbados sugar
- Carob powder
- Caramel
- Chicory
- Corn syrup solids
- D-Tagatose
- Dulcitol
- Erythritol
- Fructose
- Grape syrup
- Gur
- High fructose corn syrup (HFCS)
- High fructose glucose syrup
- Honey
- Hydrogenated starch hydrolysate
- Isoglucose
- Isomalt
- Jaggery
- Lactitol
- Levulose
- Maltitol
- Mannitol
- Molasses
- Muscovado sugar
- Palm sugar
- Panella
- Polydextrose
- Raffinose
- Rapadura
- Sorghum
- Sorbitol
- Xylitol

Sample Menu #1 (0- 5 grams fructose/day)

Breakfast

Oatmeal
Dried cranberries, 1 Tbsp.
Wheat Free Toast with margarine
Milk, Black Coffee

Snack

Cheese
Crunchmaster multi-grain crackers

Lunch

Roast beef sandwich made with Wheat Free bread
Celery sticks, 2
Corn chips, 10-15
Fresh apricot, 1
Milk

Snack

Corn Chex cereal
Peanuts

Dinner

Baked chicken breast
Brown rice
Green peas, ½ cup
Romaine salad, 1 cup with vinegar, oil and sugar dressing
Lemon sorbet
Milk

Snack

Popcorn
Diet soda

Sample Menu #2 (0- 5 grams fructose/day)

Breakfast

Puffed Rice cereal with milk
Cantaloupe, ¼ cup
Rye toast with margarine
Coffee, black

Snack

Peanut butter sandwich made with wheat free bread

Lunch

Tuna salad sandwich on wheat free bread
Baby carrot sticks, 5
Ice cream with ½ cup strawberries
Milk, Diet soda

Snack

Glutino Gluten Free Pretzel Sticks

Dinner

Pork chop
Baked sweet potato with margarine,
Beets, 1/2 cup
Spinach salad, 1 cup with vinegar, oil and sugar dressing
Milk, Hot tea

Snack

Corn tortilla
Cheese

Source: Karen Palmer RD, LD, CDE
Diabetes/Nutrition Educator, North Memorial Medical Center Minnesota