

Sugar Alcohols

Sugars & Sweeteners

Sugar alcohols are only partially absorbed from the human small intestine. The percentage absorbed varies with each sugar alcohol and in some cases with the presence of food. The absorption rate is slow, variable, usually minimal and may have no significant effect on blood glucose (2008 CPGs) and so sugar alcohols should be subtracted from the total carbohydrate when carbohydrate counting.

The sugar alcohol not absorbed in the small bowel is fermented by colonic bacteria to produce short chain fatty acids. These short chain fatty acids are absorbed and provide energy to the body. In this way, lactitol, which is completely malabsorbed in humans, produces 2 kcal/g. Because of these fermentation by-products, the consumption of large amounts of sugar alcohols can lead to temporary abdominal discomfort such as bloating and diarrhea. The symptoms depend upon an individual's sensitivity and other foods eaten at the same time. Most people will adapt after a few days (in a manner similar to that seen with high fiber foods). Eating less than 10 grams of sugar alcohols daily is a conservative recommendation representing a level unlikely to cause problems for the vast majority of people. The size of a person is believed to be more important than age or health status in determining the laxation threshold. The laxation threshold is the amount of sweetener taken before abdominal discomfort appears. If your clients are taking medicines that block fat (e.g. orlistat or Xenical®) or sugar (acarbose or Prandase®), they may get severe abdominal discomfort if they eat foods with sugar alcohols.

Name	Brand Name	Uses*	Other things to know
Sorbitol		Throat lozenges; mouthwash; toothpaste; sugar-free candies and gums; breakfast cereal; toaster pastries; candy bars; granola bars; ice cream; cookies; pie fillings; fruit spreads; pancake syrups	<ul style="list-style-type: none"> • 2.6 kcal/g • 50 to 79% small bowel absorption • Laxation threshold: 50 g/day • Found naturally in fruits and vegetables. Manufactured from corn syrup or glucose.
Mannitol		Chocolate coatings for ice cream and	<ul style="list-style-type: none"> • 1.6 kcal/g • 50% small bowel absorption

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		confections	<ul style="list-style-type: none"> • Laxation threshold: 20 g/day • Occurs naturally in pineapple, olives, asparagus, sweet potatoes and carrots. • For commercial uses, it is extracted from seaweed or made from mannose.
Maltitol		Chocolate coating for nutritional bars; chocolate flavoured bars and baked products; in baked goods such as cookies and cakes; and in ice cream	<ul style="list-style-type: none"> • 3 kcal/g • 50 to 75% small bowel absorption • Laxation threshold: 100 g/day • It gives a creamy texture to foods • Made from high maltose corn syrup
Xylitol		Oral care products; chewing gum; mints	<ul style="list-style-type: none"> • 3 kcal/g • 50% small bowel absorption • Laxation threshold: 50 g/day • Also called “wood sugar”. • Found naturally in straw, vegetables, fruit and cereals. • Made commercially from xylose. • It has a cooling reaction in the mouth.
Lactitol		Hard and soft candies; chewing gums; chocolate bars and coatings; baked products; sugar-reduced preserves; ice cream	<ul style="list-style-type: none"> • 2 kcal/g • 0% small bowel absorption • Laxation threshold: 20-50 g/day
Erythritol			<ul style="list-style-type: none"> • 2.6 kcal/g • Well tolerated at a daily dose of 1.0 g/kg body weight**
Isomalt	Palatinit	Hard candies including candy canes; fudge; toffee; cough drops; lollipops	<ul style="list-style-type: none"> • 2 kcal/g • 50 to 60% small bowel absorption • Laxation threshold: 50 g/day
Hydrogenated	Lycasin	Hard candies;	<ul style="list-style-type: none"> • 3 kcal/g

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starch hydrolysates (HSH), polyol syrups (e.g. sorbitol syrup if sorbitol is >50%), polyglycitol or polyglucitol	Stabilite Hystar MultiSweet	caramels; soft candies, chocolates, ice cream and nutritional bars	<ul style="list-style-type: none"> • Laxation threshold: approx. 100 g/day – the actual level depends on the composition of the HSH • Produced by the partial breakdown of corn, wheat or potato starch and subsequent hydrogenation. • Hydrogenation of carbohydrates does not lead to the same health issues seen with the hydrogenation of fat.
Polydextrose		Ice creams; chocolate wafer bars	<ul style="list-style-type: none"> • 1 kcal/g • 0% small bowel absorption • Laxation threshold: 90 g/day

*gums, candies, ice cream, cookies, oral care products are usually labelled “dietetic”, “sugar free” or “no sugar added”

**Tetzloff et al. Tolerance to Erythritol Ingestion in Humans. *Regulatory Toxicology and Pharmacology*, page S286, 24(2), October 1996.

References:

1. Canadian Diabetes Association Clinical Practice Guidelines Expert Committee. Canadian Diabetes Association 2008 clinical practice guidelines for the prevention and management of diabetes in Canada. *Can J Diabetes*. 2008;32(suppl 1):S1-S201.
2. SPI Polyols, Inc. New Castle, DE (1-800-789-9755)
3. Lyn O'Brien Nabors, Calorie Control Council (Atlanta, GA 404-252-3663)
4. Yale-New Haven Nutrition Advisor, Nutrition Clinic at Yale-New Haven Hospital (1-203) 688-2422.
5. Joslin Diabetes Center (www.joslin.harvard.edu/education/library)
6. Wolever et al., *Can J Diabetes*, 26(4):356-362, 2002.
7. www.healthcanada.ca/nutritionlabelling

Nutrition Education Resource Committee
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