

Nutrition Guideline

Healthy Infants and Young Children

Sugar Substitutes

For Professional Reference Only

Applicable to: Nurses, Physicians and Other Health Professionals

Recommendations

Birth to 12 months of age:

- Sugar substitutes are not recommended for infants under 12 months of age. There is a lack of research on safety of sugar substitutes during infancy.

12 months of age and older:

- Foods and beverages containing sugar substitutes are often not nutrient dense and generally not recommended. For optimal growth and development nutrient dense foods are recommended for infants and children.
- There is no evidence to indicate occasional use of sugar substitutes would cause harm. There is a lack of research on children and the use or safety of sugar substitutes.
- Certain clinical situations may require the use of sugar substitutes (e.g. diabetes); this should be under the direction of the child's health care provider.

Health Benefits

This guideline will provide information on, and considerations for, the use of sugar substitutes for infants and young children. This information will assist health professionals when educating parents on appropriate food and beverage choices for infants and young children to support healthy growth and development.

Key Questions

What is a sugar substitute?

Sugar substitutes include artificial sweeteners and intense sweeteners obtained from natural sources.¹ They may be bought as table top sweeteners or present in beverages (such as pop or fruit flavoured beverages), "diet" products, yogurt, breakfast cereals, canned fruit packed in water, baked goods, desserts, spreads, salad dressings and chewing gums. Sugar substitutes can be nutritive (provide carbohydrates and energy – example: sugar alcohols) or non-nutritive (provide minimal or no carbohydrates and energy – example: aspartame).

The sugar substitutes that are approved for use as food additives in Canada are regulated by Health Canada under Canada's Food and Drug Regulations.^{1,2} Sugar substitutes can be found on the ingredient list on packaged foods.³ The sugar substitutes approved (within set limits) for use in food products and sold as table top sweeteners in Canada are listed in Table 1.^{1,3}

Should infants (birth – 12 months) consume sugar substitutes?

From birth to around six months of age infants only need to consume breastmilk. A commercial infant formula is recommended for infants who are not breastfed or are partially breastfed. When infants are introduced to complementary foods, they need to be provided with nutrient dense foods to meet their nutrient needs. Foods containing sugar substitutes are often not nutrient dense.

There are no known published research articles which look at sugar substitutes and safety in infancy. Due to the lack of research in this area and the critical nutritional needs at this age, sugar substitutes are not recommended for infants under the age of 12 months.⁴

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Should healthy children (12 months and older) consume sugar substitutes?

There is no evidence to show harmful effects of occasional consumption of sugar substitutes. However, due to the limited research in this area and the critical nutritional needs for normal growth and development in children, foods and beverage containing sugar substitutes are generally not recommended.^{5,6,7}

To prevent nutrient deficiencies, children should be offered a variety of foods daily from the four food groups in [Canada's Food Guide](#). Frequent, nutrient-dense meals and snacks are important to meet a young child's nutrient and energy needs.⁷ Water should be encouraged to quench thirst. Foods with added sugar should be limited. Providing children with a variety of whole, nutrient dense, foods will support the formation of healthy eating habits.

Can infants and young children consume foods containing sugar alcohols?

Sugar alcohols can be naturally found in some foods or added as a sugar substitute during processing (see Table 1 for examples). Whole foods, such as cauliflower, berries and apples which contain natural sources of sugar alcohols or polyols,^{1,8} can be provided as they are nutrient dense and are a healthy choice for infants and young children.^{5,6}

Sugar alcohols can be added to some medications and processed foods, such as hard candies and chewing gum. Foods containing added sugar alcohols may be less nutrient dense than unprocessed foods.⁸ Large doses of sugar alcohols may pose a risk of negative gastrointestinal side-effects; the effect of which may differ between sugar alcohols.⁴ Dose-response studies have demonstrated that high consumption of commercial sugar alcohols can result in gastrointestinal upset, including excessive gas, cramping and diarrhea.^{9,10} Sugar alcohols added to processed foods are typically not appropriate foods to offer to children.

Are there situations when sugar substitutes may be recommended for children (12 months and older)?

There are times when a health care provider may recommend the use of sugar substitutes for a child (e.g. for a child with diabetes). Based on current evidence, Health Canada has approved some sugar substitutes and set safe levels of intakes, also referred to as the Acceptable Daily Intakes (ADI), in Canada.⁴ The ADI is "the amount of a food additive, corrected for body weight that can be ingested daily over a lifetime without appreciable health risk."⁴ (Refer to Table 1) Canadian ADIs are set by Joint FAO/WHO Expert Committee on Food Additives and Health Canada. Healthy, nutrient dense foods that contain sugar substitutes within the ADIs are considered safe.¹

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Table 1. Sugar Substitutes in Canada

Note: New food products are often released. This is not an extensive list of brand names.^{1,3,4}

Sugar Substitute	Common Brand Name(s)	ADI mg / kg body weight ^{A,B}
Acesulfame-potassium (Acesulfame-k)	Sunett [®] Equal [®]	15
Alitame	n/a	0-1
Aspartame	Nutra-sweet [®] Equal [®]	40
Cyclamate	Sugar Twin [®]	0-11
D-tagatose	n/a	125
Neotame	n/a	0-2
Purified Stevia extract (steviol glycosides)	Truvia [®] SweetLeaf [®] Sugar Twin Stevia [®]	4
Saccharin	n/a	0-5
Sucralose	Splenda [®] Sugar Twin Sucralose [®]	0-15
Sugar alcohols (hydrogenated starch hydrolysates, isomalt, lactitol, maltitol, mannitol, sorbitol, xylitol and erythritol)	n/a	n/a
Thaumatococin	n/a	No ADI has been set

^A ADI example: a 10 kg (22 lb) person could have 150 mg of sucralose per day. A 30 gram serving of cereal may contain 2.0 mg of sucralose.

^B ADI applies to all age groups as it is based on weight, not age.

Are there any medical conditions where sugar substitutes need to be avoided?

There are two medical conditions which require the avoidance of particular sugar substitutes. Individuals diagnosed with phenylketonuria (PKU) cannot consume high levels of phenylalanine. Aspartame contains the amino acid phenylalanine. Individuals with PKU should avoid all food products that contain aspartame.^{1,2,4} The Food and Drugs Act requires that all food and beverage products containing aspartame be labelled as containing phenylalanine.^{1,3}

D-tagatose is a sugar substitute that is metabolized the same way as fructose in the body.⁴ Individuals diagnosed with a fructose metabolism disorder should avoid products containing D-tagatose.⁴

Are there any handouts on sugar substitutes for healthy infants and children that I can use with my clients?

For infant nutrition resources visit Nutrition Education Materials at <http://www.albertahealthservices.ca/nutrition/Page11115.aspx> and click on **Infants**.

For more information related to healthy infants and children see [Healthy Parents Healthy Children](#).

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References

- ¹ Health Canada. Sugar substitutes [Internet]. 2010 [cited 2015 Feb 27]. Available from: <http://www.hc-sc.gc.ca/fn-an/securit/addit/sweeten-edulcor/index-eng.php>.
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- ⁹ Vernacchio L, Vezina RM, Mitchell AA. Tolerability of oral xylitol solution in young children: Implications for otitis media prophylaxis. *Int J Pediatr Otorhinolaryngol*. 2007;71:89-94
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