Frequently Asked Questions

Nonnutritive sweeteners: current use and health perspectives: a scientific statement from the American Heart Association and the American Diabetes Association.

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What are nonnutritive sweeteners (NNS)?
NNS is the term used to describe very low-calorie sweeteners, artificial sweeteners, no caloric sweeteners, and intense sweeteners. These sweeteners have a higher intensity of sweetness per gram than sweeteners that add calories (added sugars) such as sucrose, corn syrups, and fruit juice concentrates. As a replacement for added sugars, NNS are added in smaller quantities; hence, they provide no or few calories.

What foods contain NNS?
Today, NNS are widely used in thousands of beverages and other food products such as diet soft drinks, yogurts, desserts, and gum. Food manufacturers often use a blend of NNS or use a blend of a caloric sweetener such as sucrose and NNS to improve the flavor acceptability of NNS. NNS are most commonly used in diet soft drinks, otherwise known as diet carbonated beverages or diet soda pop.

Regular soft drinks are the No. 1 source of added sugars in Americans’ diets. 12-ounces of regular soda (1 can) has an estimated 130 calories (or 8 teaspoons) of added sugars.

How can I identify NNS?
There are six NNS that are described in the table below. Aspartame, acesulfame-K, neotame, saccharin, and sucralose are regulated as food additives by the US Food and Drug Administration (FDA) and therefore had to be approved as safe before being marketed. Regarding stevia, at this time, the FDA has not made a determination as to its Generally Recognized As Safe (GRAS) status, but has issued no objection letters for a number of Generally Recognized As Safe notifications for stevia sweeteners.
<table>
<thead>
<tr>
<th>Sweetener</th>
<th>Chemical structure</th>
<th>Common Brand names</th>
<th>ADI&lt;sup&gt;1&lt;/sup&gt;- JECFA&lt;sup&gt;2&lt;/sup&gt; Toxicology Monograph #</th>
<th>Year FDA Approved</th>
<th>Representative amount of sweetener in 12 oz. soft drink&lt;sup&gt;3&lt;/sup&gt;</th>
<th>Number of servings = to ADI for a 150# (68 kg) person</th>
<th>Amount of sweetener in a packet (mg) (equivalent to 2 tsp sugar)&lt;sup&gt;4&lt;/sup&gt;</th>
<th>Number of packets = to ADI for 150# (68 kg) person</th>
</tr>
</thead>
<tbody>
<tr>
<td>Acesulfame-K</td>
<td>potassium 6-methyl-2,2-dioxo-oxathiazin-4-olate</td>
<td>Sweet One</td>
<td>15 mg/kg bw #28 (1991)</td>
<td>1988</td>
<td>40 mg (blended with aspartame)</td>
<td>25, 12 oz. servings</td>
<td>50</td>
<td>20 packets</td>
</tr>
<tr>
<td>Aspartame</td>
<td>N-(L-α-Aspartyl)-L-phenylalanine, 1-methyl ester</td>
<td>NutraSweet Equal</td>
<td>40 mg/kg bw #15 (1980)</td>
<td>1981</td>
<td>187 mg</td>
<td>14, 12 oz. servings</td>
<td>40</td>
<td>68 packets</td>
</tr>
<tr>
<td>Neotame</td>
<td>N-[N-(3,3-dimethylbutyl)-L-aspartyl]-L-phenylalanine 1-methyl ester</td>
<td>Neotame</td>
<td>2 mg/kg bw #52 (2004)</td>
<td>2002</td>
<td>Not in carbonated beverages</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Saccharin</td>
<td>1,1-Dioxo-1,2-benzothiazol-3-one</td>
<td>Sweet’N Low</td>
<td>5 mg/kg bw #32 (1993)</td>
<td>Prior to 1958</td>
<td>144 mg maximum</td>
<td>2, 12 oz. servings</td>
<td>40</td>
<td>8.5 packets</td>
</tr>
<tr>
<td>Sucralose</td>
<td>1,6-Dichloro-1,6-dideoxy-β-D-fructofuranosyl-4-chloro-4-deoxy-α-D-galactopyranoside</td>
<td>Splenda</td>
<td>15 mg/kg bw #28 (1991)</td>
<td>1999</td>
<td>68 mg</td>
<td>15, 12 oz. serving</td>
<td>11</td>
<td>30 packets</td>
</tr>
</tbody>
</table>

**Plant Based Sweeteners**

| Stevia, as (steviol glucosides)<sup>5</sup> | Truvia PureVia Sweet Leaf | 4 mg/kg bw # 60 (2009) | 2008 | 17 mg | 16 – 12 oz. Servings | 9 | 30 packets |

1. Acceptable Daily Intake (ADI) is a measure of the amount of a specific substance in food or drinking water that can be ingested over a lifetime without an appreciable health risk. Measurement is usually expressed in milligrams of sweetener per kilogram of body weight (mg/kg bs). The amount is usually set a 1/100 of the maximum level at which no adverse effect was observed in animal experiments.


3. The amount of sweetener if the product is exclusively sweetened with one sweetener. Very frequently more than one sweetener is used in soft drinks or other products. Usually this information is proprietary and is not available to the public.

4. One packet has the sweetness of 2 teaspoons of sugar. One packet of sweetener has less than 4 calories compared to 32 calories in 2 teaspoons of sugar.

5. Another plant-based sweetener, Lo Han Gau, has recently been approved by the FDA.

References:


Source: [http://circ.ahajournals.org/lookup/doi/10.1161/CIR.0b013e31825c42ee](http://circ.ahajournals.org/lookup/doi/10.1161/CIR.0b013e31825c42ee)
Does using NNS help to reduce added sugars intake?
Limiting added sugars is an important strategy for supporting optimal nutrition and healthy weights, as concluded in the 2009 AHA Scientific Statement “Dietary Sugars Intake and Cardiovascular Health.” In addition, monitoring carbohydrate intake, which includes limiting added sugars, is also a key strategy to achieve glycemic control as published in the American Diabetes Association Clinical Practice Recommendations.

There are some data to suggest that NNS may be used in a structured diet to replace sources of added sugars and that this substitution may result in modest energy intake reductions and weight loss.

Successful reduction in energy intake requires that there is incomplete compensation of energy reduction from the use of NNS-containing beverages and/or foods. Research suggests that when used judiciously, NNS could facilitate reductions in added sugars intake, thereby resulting in decreased total energy and weight loss/weight control, and promoting beneficial effects on related metabolic parameters. However, these potential benefits will not be fully realized if there is a compensatory increase in energy intake from other sources.

Will the substitution of NNS for added sugars in beverages and other foods help people attain and maintain a healthy body weight?
Using NNS is one of many strategies to help people move towards a healthier eating pattern. Research suggests that when NNS are used judiciously, NNS can help reduce added sugars intake, thereby resulting in decreased total energy and weight loss/weight control. However, these potential benefits will not be fully realized if there is a compensatory increase in energy intake from other sources. In other words, if you add more calories to make up for what you saved by using low and no-caloric sweeteners, there won’t be any weight loss.

Food and beverage products containing NNS may help people attain or maintain a healthy body weight when used in place of full-calorie products, if not compensated for otherwise; that is, the previous NNS choice might be deliberate in anticipation of a known future selection of a higher caloric snack, meal or beverage. For example, selection of a diet/0 calorie soda to accompany a hot fudge sundae; the selection of a high caloric content food exceeds the benefit of the zero calories in the diet soda.

More research and data are needed from well-designed human trials exploring the potential role of NNS in achieving and maintaining a healthy body weight and minimizing cardiometabolic risk factors.

Is it better to choose sugar sweetened beverages over diet sodas/soft drinks because some of the data are inconclusive about weight gain associated with sugar sweetened beverages?
Over the past 30 years, total calorie intake has increased by an average of 150 to 300 calories per day, and approximately 50% of this increase comes from liquid calories (primarily added sugars from sugar-sweetened beverages). At the same time, there has been no apparent change in physical activity. Hence, it is likely that weight gain over the same period is related in part to increased intake of added sugars, even though research tools thus far have been insufficient to confirm a direct link.
Should I use NNS to improve my health?
It is smart to reduce caloric intake from added sugars by substituting diet or sugar free sodas, sugar free soft drinks and water for sugar-sweetened beverages. The American Heart Association recommends that individuals limit intake of sugar-sweetened beverages to 450 kcal (36 oz) per week or less.

Will the use of diet sodas and NNS in foods and beverages prevent or help treat obesity?
Obesity is a multifactorial condition and because it is extremely difficult to identify, much less quantify, the relative contributions of each factor. Some of these factors include energy imbalance, food choices, physical activity, and “built environment.”

Because overweight and obesity are complex metabolic conditions, it is unlikely that a single food or food group is the primary cause of the problem. Using diet sodas and NNS in foods and beverages is only one way to reduce energy intake from added sugars and decrease total calories.

Treating obesity is complex and includes assessment of health risk, assessment of current behavior and readiness to change, advice to change specific behaviors, collaborative agreement about behavior changes and goals, and assistance with barriers, support, and follow-up.

Does AHA support limiting sugar sweetened beverages (SSBs)?
Americans should limit the amount of added sugars in the foods they eat and the beverages they drink. As part of the AHA’s goal of improving the cardiovascular health of all Americans by 2020, the AHA recommends limiting SSB consumption to < 450 kcal (36 oz)/week, based on a 2000 calorie diet. The SSB metric is one way in which the AHA will gauge the improvement in diet quality and help the population achieve ideal cardiovascular health.
http://www.heart.org/HEARTORG/GettingHealthy/NutritionCenter/HealthyDietGoals/Healthy-Diet-Goals_UCM_310436_SubHomePage.jsp.

Can people with diabetes use NNS?
Although people with diabetes can substitute small amounts of sugar for other carbohydrate containing foods into their meal plan and still keep blood glucose levels on track, it requires careful carbohydrate counting and meal planning to include sugar sweetened beverages and foods in the plan. Foods and drinks that use non-nutritive sweeteners are another option for people with diabetes. Non-nutritive sweeteners (also known as, artificial sweetener, low-calorie sweeteners, or sugar substitutes) can be used to sweeten food and drinks for less calories and carbohydrate when they replace sugar.