Use of Noncaloric Sweeteners

Many people with diabetes restrict the amount of refined sugars (e.g., glucose and sucrose) in their diet. Consequently, noncaloric sweeteners are often used. There are two federally approved noncaloric sweeteners, saccharin and aspartame. Concerns related to saccharin and aspartame use have focused on their safety.

Saccharin. A small risk for bladder cancer continues to be associated with high-dose consumption of saccharin in certain laboratory animals. However, epidemiological studies show no evidence of a carcinogenic effect in humans. Although the question of carcinogenicity of saccharin for humans cannot be completely ruled out, the risk, if any, from ingestion at moderate levels is considered to be extremely small. Because saccharin can cross the placenta, heavy use during pregnancy should be avoided.

Aspartame. Aspartame (a protein sweetener composed of 2 amino acids) is technically a nutritive or caloric sweetener; however, it is so sweet that it is effectively noncaloric in the amounts normally consumed. Various safety concerns have been raised in regard to aspartame. Nonetheless, aspartame has been determined to be safe for the general population as well as for people with diabetes. This has been reaffirmed in ongoing evaluation by the Food and Drug Administration (FDA).

Based on available evidence, the American Diabetes Association (ADA) finds the use of the two commercially available noncaloric sweeteners saccharin and aspartame to be acceptable (1). The following are additional recommendations.

1. The use of both sweeteners (saccharin and aspartame) is encouraged for the particular advantages of each.

2. The use of aspartame and saccharin should be within the levels established as acceptable.

   Ingestion of 50 mg aspartame $\cdot$ kg^{-1} body wt $\cdot$ day^{-1}, which is ~1% of the amount shown in animals and humans to have no toxic effects, has been established as the lifetime ADI for aspartame by the FDA. An intake of 50 mg $\cdot$ kg^{-1} body wt $\cdot$ day^{-1} is equivalent to the daily consumption of ~17 12-oz cans of a 100% aspartame-sweetened soft drink by a 70-kg (154-lb) person. The usual level of aspartame consumption is well below this amount. For example, data indicate that <10% of adults consume aspartame in amounts >3.5 mg/kg body wt, and <10% of children 2–5 yr old consume >11 mg/kg body wt on days in which aspartame was ingested.

   As established by the 1955 GRAS (Generally Recognized As Safe) list of recommendations, an intake of 500 mg/day of saccharin for children and ~1000 mg/day for adults is acceptable. One teaspoon (1 packet) of saccharin powder, which includes a buffer, contains 14–20 mg of saccharin. Thus, a child could consume ~25–35 packets/day, and an adult could consume 50–70 packets/day. No other limitations for saccharin use have been established. Actual consumption levels of saccharin are likely to be considerably below these levels.

3. The food industry is encouraged to label products with the amounts of noncaloric sweeteners present, as it should all food ingredients. Labeling should include the amount of each ingredient in milligrams per serving and the number of servings per container.

4. We encourage continued research to rule out any suspected risks and to determine the metabolic effects of long-term individual and combined sweetener use in diabetic people. The contribution of noncaloric sweeteners to diabetes control and to weight reduction also merits further investigation.

In conclusion, the dietary needs of people with diabetes vary, and the use of any sweetener should be individualized with consideration to overall diet and nutritional adequacy. ADA recommends that people with diabetes consult a nutritionist, physician, or health-care professional knowledgeable about diabetes nutrition management concerning the amount and source of sweeteners in their daily meal plans.

ORIGINALLY APPROVED MARCH 1987. REVIEWED OCTOBER 1987 AND OCTOBER 1989.

REPRINTED FROM *DIABETES CARE* 10:526, 1987.

IN 1988, ACESULFAME-K WAS APPROVED FOR USE IN SPECIFIC PRODUCTS AS A NONCALORIC SWEETENER. THE ACCEPTABLE DAILY INTAKE (ADI) FOR ACESULFAME-K IS 15 MG/KG. OTHER NONCALORIC SWEETENERS ARE CURRENTLY UNDER FOOD AND DRUG ADMINISTRATION (FDA) REVIEW.

References

1. ADA position statement: Nutritional recommendations and principles for individuals with diabetes mellitus: 1986. *Diabetes Care* 10:126–32, 1987