

REPORT 3 OF THE COUNCIL ON SCIENCE AND PUBLIC HEALTH (A-08)
The Health Effects of High Fructose Syrup

EXECUTIVE SUMMARY

Objective: To review the chemical properties and health effects of high fructose corn syrup (HFCS) in comparison to other added caloric sweeteners and to evaluate the potential impact of restricting use of fructose-containing sweeteners, including the use of warning labels on foods containing high fructose syrups.

Methods: Literature searches for articles published through December 2007 were conducted in the PubMed database and the Cochrane Database of Systematic Reviews using the search terms “high fructose corn syrup” and “high fructose syrup.” Web sites managed by federal and world health agencies, and applicable professional and advocacy organizations, were also reviewed for relevant information. Additional articles were identified by reviewing the reference lists of pertinent publications.

Results: HFCS has been increasingly added to foods since its development in the late 1960s. The most commonly used types of HFCS (HFCS-42 and HFCS-55) are similar in composition to sucrose, consisting of roughly equal amounts of fructose and glucose. The primary difference is that these monosaccharides exist free in solution in HFCS, but in disaccharide form in sucrose. The disaccharide sucrose is easily cleaved in the small intestine, so free fructose and glucose are absorbed from both sucrose and HFCS. The advantage to food manufacturers is that the free monosaccharides in HFCS provide better flavor enhancement, stability, freshness, texture, color, pourability, and consistency in foods in comparison to sucrose. Concern about HFCS developed after ecological studies, using per capita estimates of HFCS consumption, found direct correlations between HFCS and obesity. In addition, human and animal studies have found direct associations between fructose and adverse health outcomes. However, the adverse health effects of HFCS, beyond those of other caloric sweeteners, most of which contain fructose, are not well established. Consumption of added caloric sweeteners in general has increased over the last 30 years, as has total calories. Likewise, rates of obesity have risen even in countries where little HFCS is consumed. Only a few small, short-term experimental studies have compared the effects of HFCS to sucrose, and most involved some form of industry support. Epidemiological studies on HFCS and health outcomes are unavailable, beyond ecological studies, because nutrient databases do not contain information on the HFCS content of foods and have only limited data on added sugars in general.

Conclusions: Because the composition of HFCS and sucrose are so similar, particularly on absorption by the body, it appears unlikely that HFCS contributes more to obesity or other conditions than sucrose. Nevertheless, few studies have evaluated the potentially differential effect of various sweeteners, particularly as they relate to health conditions such as obesity, which develop over relatively long periods of time. Improved nutrient databases are needed to analyze food consumption in epidemiological studies, as are more strongly designed experimental studies. At the present time, there is insufficient evidence to restrict use of HFCS or other fructose-containing sweeteners in the food supply or to require the use of warning labels on products containing HFCS.

RECOMMENDATIONS

The following statements, recommended by the Council on Science and Public Health, were adopted by the AMA House of Delegates as AMA directives at the 2008 Annual Meeting:

1. That our American Medical Association (AMA) recognize that at the present time, insufficient evidence exists to specifically restrict use of high fructose corn syrup (HFCS) or other fructose-

containing sweeteners in the food supply or to require the use of warning labels on products containing HFCS. (Directive)

2. That our AMA encourage independent research (including epidemiological studies) on the health effects of HFCS and other sweeteners, and evaluation of the mechanism of action and relationship between fructose dose and response. (Directive)

3. That our AMA, in concert with the Dietary Guidelines for Americans, recommend that consumers limit the amount of added caloric sweeteners in their diet. (Directive)