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Fructose Consumption May Accelerate Aging:

Skin's Elasticity And Softness May Be Affected HAIFA, Israel, November 24 , 1998 --

Researchers at the Technion-Israel Institute of Technology have shown in animal studies that excessive consumption of fructose, a sweetener, accelerates processes related to aging. Dr. Moshe Werman and Boaz Levi of the Faculty of Food Engineering and Biotechnology published their findings in the September 1998 Journal of Nutrition. Fructose, which occurs naturally in honey and sweet fruits, is produced in crystalline and syrup forms for commercial use. Its use in processed foods has greatly increased over the last 20 years. "Americans are eating more and more processed foods such as carbonated drinks, baked goods, canned fruits, jams and dairy products that contain fructose," said Werman. The researchers' laboratory tests found that rats fed fructose for a year showed significantly greater age-related alterations, manifested in their skin and bone collagen. Collagen is the protein that makes up the connective tissue in skin, tendons, bone and cartilage. Its physical, mechanical and chemical properties provide good indications of aging processes taking place in the body throughout the life span. Earlier research showed that fructose decreases [glucose tolerance](#), increases insulin resistance and speeds up the process of glycation -- a reaction of sugar and proteins which contributes to the development of normal aging as well as to some complications of diabetes. Werman's and Levi's tests proved that blood fructose, cholesterol and glycated hemoglobin were significantly higher in fructose-fed rats. Fructose also affects skin collagen crosslinking by increasing the amount of stable chemical bonds both within (intra) and between (inter) collagen molecules which in turn may reduce skin's elasticity and softness, the hallmarks of youthful skin. Since the tests were done on rats, visual aging on their skin was difficult to assess. However, Werman and Levi explain that increased cross linking leads to loss of elasticity, which in turn may lead to wrinkles. "Too much crosslinking reduces elasticity and makes the skin stiff and rigid, and these are the conditions that encourage wrinkled skin," Werman explains. Levi and Werman measured age-related alterations in rats fed a balanced commercial diet, water or a fructose solution for one year. They compared these rats to others given either glucose or sucrose solutions with their diet, instead of fructose. The rats' average daily fructose intake was 12.5 g/kg (grams per kilogram of body weight.) By comparison, a person drinking a quart of cola consumes about 45 grams fructose, which amounts to approximately .6 g/kg in an adult weighing 70 kg., and 1.2 g/kg in a child weighing 35 kg. Fructose content in a cup of yogurt with fruit is approximately 8-10 grams, and in a cup of canned fruit averages 13 grams, depending on the sweetness of the syrup. (Provisional nutrient figures supplied by the Agricultural Research Service in the U.S. Department of Agriculture.) The extent to which aging processes in laboratory animals may reflect on similar processes in humans requires more studies and guidelines for its safe consumption by both healthy and [diabetic](#) individuals. The Technion-Israel Institute of Technology commands a world-wide reputation for its pioneering work in communications, electronics, computer science, biotechnology, water-resource management, materials engineering, aerospace and medicine, among others. The majority of Israel's engineers are Technion graduates, as are most of the founders and managers of its high-tech industries. The university's 11,000 students and 700 faculty study and work in the Technion's 19 faculties and 30 research centers and institutes in Haifa. The American Technion Society (ATS) is the university's support organization in the United States. Based in New York City, it is the leading American organization supporting higher education in Israel. NOTE TO EDITORS: Color photo available. Please call or download from www.ats.org