

<S1-4>

Alternative Sugar Consumption: Its Effect on Metabolic Changes and Inflammatory Response

Yuri Kim

Ewha Womans University, Korea

Sugar consumption has been dramatically increased worldwide, in particular with added sugars in foods and beverages. The high consumption of sugar and fructose is one of the risk factors for developing both obesity and related metabolic diseases. Excessive intake of high-calorie and high-glycemic index foods or beverages leads to hormonal changes and increase of body fat accumulation. In addition, consumption of sucrose rapidly increases the blood glucose levels and controlling the level of blood glucose is helpful for managing inflammatory responses and related numerous diseases, including cardiovascular disease, arthritis, and metabolic diseases. Studies have been conducted to develop alternative sweeteners or sugar substitutes to reduce these side effects of sugar and to give health beneficial effects by alleviating the complication caused by obesity and diabetes. As a natural pentose sugar, D-xylose

and its dimer, xylobiose have been reported their anti-diabetic and anti-metabolic diseases effects. Several sucrose isomers, including turanose, leucrose, and isomaltulose which exerted their anti-adipogenic and anti-lipogenic effects in in vitro and in vivo studies. In particular, replacement of leucrose instead of sucrose suppressed inflammatory response in dextran sulfate sodium-induced colitis mice model. Furthermore, it has reported that natural high intensity sweeteners, stevia and phyllodulcin regulated obesity-related metabolic changes and hyperglycemia in diabetes. In conclusion, many alternative sweeteners possess therapeutic potential against sugar-induced metabolic diseases. Development of functional sweeteners with low side effects would be beneficial to combat obesity and related metabolic diseases.