

Enhancement of Sweet Taste by Salts

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Summary

Sweet taste of sugars (such as sucrose, fructose, and glucose) is enhanced by adding small amounts of NaCl in humans. Therefore, the phenomenon has been explained as contrast (integration) between sweet and salty sensations occurred in the brain. However, recent studies of mouse experiments demonstrated involvement of sodium-glucose cotransporter (SGLT) expressed in the sweet cells on the tongue. Here we investigated if SGLT hypothesis was also supported in humans. Fifteen healthy University students (female, 21-22 years-old) were used for sensory evaluations. Addition of 0.1% (17 mM) NaCl enhanced sweetness of all natural and artificial sweeteners tested (glucose, galactose, sucrose, fructose, and sucralose) with the most effectiveness for glucose. Effects of NaCl reached the maximum at 0.1%. The enhancement was reduced, but not abolished, by phlorizin (a nonselective inhibitor for SGLT1-6) as well as a SGLT1-selective inhibitor mizagliflozin. Effects of Na or Cl salts on enhancement of sweetness for glucose was limited compared to NaCl. Sucrose in the oral cavity for 3 min did not produce detectable concentration of glucose. These results suggest that not only SGLT, especially SGLT1, but also other mechanisms are involved for the enhancement of sweet taste by NaCl in humans.