Do artificially sweetened beverages affect hunger and energy intake? A systematic Review

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Background Sweetener is a collective name for substances added to foods to provide sweetness. There are nutritive sweeteners and non-nutritive intense sweeteners. The latter has a stronger effect of sweetening than sugar and is used to reduce the energy content in, for example, soft drinks and juices. It is debated whether the consumption of non-nutritive artificially sweetened drinks can lead to increased hunger and energy intake compared to ingestion of water or sugar-sweetened beverages. However, there are few trustworthy sources as to whether these sweeteners have an effect on appetite or not.

Objective To study the scientific basis whether non-nutritive artificially sweetened drinks provide increased sensations of hunger and/or increases the energy intake ad libitum compared to water or mineral water.

Search strategy The literature search was made in the databases PubMed and Scopus. The keywords used in the search were "sweetening agents AND nutrition AND hunger," "sweetening agents AND nutrition AND appetite", "sweetening agents AND hunger," and "sweetening agents AND appetite".

Selection criteria The study had to be a RCT, conducted on human subjects and on a healthy population including overweight/obesity persons without any complications. The study had to be written in English, and including one or both endpoints of subjective hunger and/or ad libitum energy intake.

Data collection and analysis Five articles met the inclusion criterias and these were analyzed with "Granskingsmall för randomiserad kontrollerad prövning" made by the Swedish Council on Health Technology Assessment (SBU). As a method to summarize the strength of the evidence for each endpoint GRADE was used.

Main results None of the five studies got a difference that was statistically significant in the results on the intake of non-nutritive drinks sweetened with artificial sweetener and if these increased feeling of hunger compared with the intake of water. None of the three studies, which examined whether energy intake increased after ingestion of non-nutritive drinks sweetened with artificial sweeteners compared with water, found differences that were statistically significant. The strength of evidence was moderate for the two endpoints.

Conclusions According to the reviewed literature, there is moderate evidence strength that artificially sweetened drinks do not provide increased sensations of hunger or increased energy intake in the short term compared to water or mineral water. Nevertheless, we need further RCT's with long term follow up, in order to make long term judgements.