

Public Abstract

Author: Wen ZHANG

Advisor: Ingolf Gruen

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Title: Application of natural, non-nutritive, high-potency sweeteners and sugar alcohols individually and in combination in an acidified protein beverage model

An acidified protein beverage was formulated with 5% (w/v) whey protein isolate and 0.33% (v/v) phosphoric acid, which allows a claim of “more/plus protein” in a commercial application. Due to the food-matrix dependent properties of sensory profiles, especially for sweetness intensity, the study investigated the application of sugar alcohols and natural, non-nutritive, high-intensity sweeteners individually and in combination in this acidified whey protein beverage model by sensory methodologies, with a purpose of developing a naturally sweetened sugar-free product in this category.

The ideal sucrose concentration was determined to be 10.1%. The required concentrations of selected sweeteners to achieve sweetness equivalent to the 10.1% sucrose, were 0.0876% for rebaudioside A, 0.130% for monk fruit extract, 15.5% for erythritol, 26.7% for lactitol, and 9.53% for xylitol.

By investigating sensory profiles of protein beverages with selected sweeteners individually and in combination (sweetness ratio of 50/50), results showed that sugar alcohols (erythritol, lactitol, and xylitol) had a similar sensory profile to sucrose, whereas rebaudioside A and monk fruit extract had “off-flavors” (bitterness, metallic and anise tastes), and showed differences in sweetness intensity and temporal profiles. In sweetener combinations, sugar alcohols could cover the “off-flavors”, as well as improve the sweetness temporal profile. Results indicated that it is possible to achieve both a sensory profile that is close to that of sucrose and a “natural” status, by combining sugar alcohols and natural, high-intensity sweeteners. It is also valuable to investigate different sweetness ratio to optimize the sensory profile in the future study.