

Classical and dynamic descriptive sensory profile of whole and skimmed reconstituted powdered powder sweetened with stevia at different levels of rebaudeoside A.

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Abstract

Samples of whole and skimmed powdered milk sweetened with sugar or rebaudeoside A (75% and 95%) were analyzed by sensory profile using Napping®, the acceptance by consumers and the sweetness dynamic sensory profile by time-intensity analysis. The pH and color of the samples were also evaluated, being the whole ones more acid and brighter than the skimmed ones, but all of them with shades of green and yellow.

Key words:

Sweetener, time-intensity profile, powdered milk.

Introduction

Dietetic purpose products had gain its space in the market, especially with the search of less sugar or fat foods nowadays. A study published at Brasil Food Trends 2020 shows that 21% of Brazilian people link food consumption with health, well-being, sustainability and ethics¹. The new trend shows that there are challenges in how to reduce or substitute sugar in food formulas. To use stevia as a sweetener has been a good choice, since it can be extracted from a natural source, the plant *Stevia rebaudiana*. This study brings new sensory information about reconstituted powdered milk sweetened with sugar compared with samples sweetened with stevia. Also, it shows how the product is accepted in the market, its sensory profile and how is the sweetness intensity through the time.

Results and Discussion

Six samples of reconstituted powdered milk (sweetened with different concentrations of sucrose or rebaudeoside A) were analyzed by 60 assessors to determine the ideal sweetness in which sample. The results observed in chart 1 shows that all samples of skimmed milk need to be sweetened two times more than the whole milk, for sugar or any of rebaudeoside used.

All of the following tests were made using the samples of reconstituted powdered milk sweetened as determined by the results from chart 1.

The color and pH of the milk were analyzed using the AOAC (1984) standard methodology. According to the results in chart 2, all samples of whole milk have almost the same pH, what also occurs to the samples of skimmed milk, but this with the highest pH.

For the time-intensity analyses* of sweetness in each sample, 15 assessors were selected by triangle sensory test of whole milk added with sucrose at the percentage of 3.5% and 5%. Then, the panelists were submitted to training to use the software "TIAFT" (Time-Intensity Analysis of Flavors and Tastes). After being able to use the software, the panelists tasted all six samples in triplicate.

The descriptive profile was analyzed by Napping® method with 60 panelists who described three characteristics in the the milk.

The acceptance of samples was carry-out by 120 consumers, using a non-structured hedonic scale of nine centimeters in relation to appearance, aroma, flavor, texture and overall impression.

*The results will be analyzed by ANOVA, Tukey's Honest Significant Difference test and Internal preference mapping with softwares SAS (2018) and XLStat (2017).

Table 1. Ideal sweetness of powdered milk

Sweetener used	Type of milk	Ideal percentage of sweetener
Sucrose	Whole	3%
	Skimmed	6%
Rebaudeoside A 75%	Whole	0.011%
	Skimmed	0.0188%
Rebaudeoside A 95%	Whole	0.022%
	Skimmed	0.0375%

Table 1. pH and Lab color of sweetened powdered milk

Sweetener used	Type of milk	pH	L*	a*	b*
Sucrose	Whole	6.6	89,50	-1,36	8,46
	Skimmed	7.3	85,52	-3,29	7,42
Rebaudeoside A 75%	Whole	6.5	89,68	-1,37	8,39
	Skimmed	7.3	86,70	-3,27	7,26
Rebaudeoside A 95%	Whole	6.6	89,68	-1,33	8,55
	Skimmed	7.3	86,71	-3,27	7,25

Conclusions

Whole reconstituted powdered milk needs less percentages of sweetener than the skimmed milk, being it sugar or stevia. It is also more acid and brighter than the skimmed.

¹ Queiroz, G. C.; Rego, R.A.; Jardim, D. C. P.; Brasil bakery & Confectionery Trends 2020. Campinas: ITAL, 2014. 321 p.