



Study of intentional and unintended consumption of non-nutritive sweeteners by brazilians

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Abstract

A survey of the partial or total substitution of sugar by non-nutritive sweeteners (NNS) was carried out in 14 classes of sweetened processed foods (SPF) available in Brazilian trade. For each product class were determined the percentages of: (i) regular, reduced and sugar-free products; (ii) label claims (LC) used for express partial or total sugar reduction; (iii) products added by NNS without LC; (iv) NNS used, and (v) comparison of nutritional profile between regular, reduced and sugar-free products. Subsequently, Brazilian's consumers perception about SPF was assessed through an online questionnaire, which determined the: (i) NNS and SPF consumption; (ii) perception of natural and artificial NNS and sugar in foods through the Check-all-that-apply (CATA) test and (iii) ability to understand different FPC.

Key words:

Non-nutritive sweetener, processed sweetened foods, consumers

Introduction

Sugar consumption is highly correlated with the increase in chronic non communicable diseases, which account for 60% of all deaths worldwide¹. Therefore, the WHO has strongly recommended reducing the intake of this nutrient. One of the strategies to achieve this goal is the partial or total added sugars substitution in food by NNS, in order to guarantee the sweetness desired by consumers². This study aimed to evaluate the NNS use in processed foods, the adequacy of the label claims in sweetened food with partial or total sugar replacement by NNS and the perception and consumption of these products by Brazilian consumers.

Results and Discussion

The results showed that 90% of the NNS used were artificial and that 19% of the products added by NNS did not have food label claim on the front panel (most within the powdered dessert classes, powdered drink mix and whey protein). Compared to regular ones, the products with NNS had carbohydrate and calories reduction, but an increase of up to 414% in sodium concentration, which may negatively impact human health.

The 5 most frequent label claims were "no sugar", "light", "no sugar added", "diet" and "low calorie" (94% of the total), being the "no sugar" the most representative. Considering the expected sugar content according to the Brazilian regulation for food label claims, the claims "contains only sugars from the ingredients", "no sugar", "no sugar added" and "diet" were correctly used for at least 78% of the SPF. On the other hand, the claim "light" had the higher incorrect usage (38%). In relation to the SPF classes evaluated, those that had wrong use of the food label claims were: soft drinks/ flavored waters (10%), dairy (18%), ready to eat desserts (25%), tea/ cappuccinos/ chocolate powdered (29%), cereal bar (60%), ice cream (67%) and chocolate (100%).

The online questionnaire results showed that meaning food claims "does not contain" and "diet" were correctly understood for > 90% of consumers. However, the claims that express "partial sugars reduction" showed high frequency of wrong interpretation by consumers, especially "light" and "low calorie", obtaining, respectively, only 51.4% and 42.8% of correct

associations. To evaluate the consumer's perception about sugar and SSN, the CATA test responses were separated and agglomerated into clusters (3 clusters formed, containing 1177, 852 and 157 participants). The artificial NNS was similarly described with negative terms by the 3 clusters. Sugar was associated with diabetes and obesity by clusters 1 and 2 and also described by sensorial negative terms (as cloying) by cluster 3. Natural NNS was the stimuli that had the greater perception difference between the groups, being rejected by cluster 1, evaluated in a neutral way by 3 and positively by 2.

The comparison between the products availability on the market and the participant preferences indicated that the NNS unintended consumption may occurs in some products class (powdered drink mix, powdered desserts mix and whey protein) in which most of available products are added with NNS, but most consumers declare to eat these only at regular version (sweetened only with sugar, without NNS addition). The main similarities of these products classes were the powdered presentation and the absence of food label claim in front panel to advertise the NNS addition in the product.

Conclusions

There are some errors in the claims use by food industry and in their interpretation by consumers, inducing the unintended sugars consumption (partial and total reduction interpretation) and/ or sweeteners (presence in not foreseen foods). This can be improved by: (i) mandatory label claims implementation on the NNS-added products front panel (to clarify these assets use); (ii) review of food label claims permitted by ANVISA and/or consumer education campaign about their meanings and (iii) greater sweetened processed food labels adequacy oversight.

Acknowledgement

To PIBIC / CNPq and FAPESP (2018/563-5) for research grants awarded.

¹Alwan, A.; Maclean, D. R.; Riley, L.M.; D'espaignet e. T.; Mathers, C. D.; Stevens, G. A.; et al. *Lancet*, **2010**, 376, 1861-1868.

²Associação Brasileira da Indústria de Alimentos. **2017**. Disponível em: <https://www.abia.org.br/vsn/tmp_2.aspx?id=338> Acesso em: 25/03/2018.