

THE IMPACT OF THE NON-ADDED SUGAR CLAIM ON CHILDREN ACCEPTANCE TOWARDS ORANGE JUICE ENRICHED WITH STEVIA. THE IMPORTANCE OF PARENTS AND CHILDREN FOOD NEOPHOBIA

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Abstract: The impact of nutritional claims and Food Neophobia (FN) trait on consumers' hedonic evaluation in food products is well documented. However, there is scarce information regarding the relevance of these claims on children acceptance in the beverage. The main objective is to analyse how the non-added sugar claim and the children food Neophobia trait and that of their parents play an important role in the acceptance of orange juice enriched with Stevia. Data was collected using the Children Food Neophobia scale in a face-to-face environment of 175 parents with a hedonic evaluation test of 175 primary school students (9-10 years) from three school centres. Three commercial juices (from nectar, concentrate and 100% squeezed) and three own prepared orange juice (100% recently squeezed, 100% recently squeezed with added sugar and 100% recently squeezed with added stevia) were analysed. Results showed the importance of information on children expectation and the relevance of the nutritional claims and FN on juice acceptance, highlighting the relevance of these marketing strategies in targeting children.

Keywords: Children Food Neophobia, hedonic evaluation, assimilation model, orange juice.

1. Introduction and Objectives

Innovations in food and beverages that introduce improvements of healthiness attributes are increasingly gaining relevance at market place. In the beverage sector, the use of natural and non-caloric sweeteners such as Stevia as innovative option compared to the non-added sugar traditional alternative is gaining relevance. This is because consumers are not willing to compromise on taste of foods and beverages for eventual health benefits (Realini *et al.* 2014). The acceptance of innovative health attribute is related to Food Neophobia (FN) personality trait which involves the rejection of unfamiliar food, in particular in children population. The Food Neophobia (FN) is a personal and heritable trait (Knaapila *et al.*, 2007) that describes human unwillingness to consume unknown food and that has been extensively studied in consumers and children research.

The juice sector for children in Spain is characterized by the use of nutritional claims on packaging as an advertisement strategy to cope children attention (European Fruit Juice Association, 2018), in particular in nectar products. According to the Spanish Agency for Food Safety and Nutrition, children aged between 9 to 11 years are the most intensive sugar consumers and thus, they represent an attractive population to be targeted for promoting healthier beverages. In this context, the main objective of this study is to analyse the children acceptance towards orange juice with added Stevia using two nutritional claims: non-added sugar and with sweetener. Furthermore, to analyze the impact of Food Neophobia measured both at children and parents levels on juice acceptance.

2. Methodology

Data was collected using three open-ended questionnaires completed in three different stages. The sample consisted of 175 children from primary schools in Castelldefels (Barcelona). The experiment was conducted during March 2019. Parents were informed about the general aspects of the experiment and agreed with the participation of their children in the experiment to at the university facilities. They were also informed that the data collection is anonymous and the analysis ensures the statistical confidentiality.

2.1. The hedonic evaluation test in sensory laboratory

In the **first stage**, a hedonic evaluation was carried out using six types of orange juice. Three commercial: Nectar (NEC), from concentrate (CON), 100% squeezed (SQU) and three own-prepared using fresh orange from Navelina variety: 100% recently squeezed (NAT), 100% recently squeezed with added sugar (SGR) (15g/l) and 100% recently squeezed with Stevia (STV) (5g/l at 2%). The hedonic evaluation was performed in controlled environment using individual tasting booths of the School of Agricultural Engineering of Barcelona (Castelldefels). The Sensory evaluation was carried out on seven days. Fourteen sensory sessions were conducted with 12-13 children. Each session lasted approximately one

hour and was performed in the morning between 10:00 and 12:00 a.m. For each session, the juice samples were prepared shortly before analysis. The children liking was elicited using 9-points Likert scale using face icons. The liking of the sweetness, bitterness and global acceptability were evaluated.

The liking test is based on the expectancy-disconfirmation model to analyze the impact of information (juice types and nutritional claims) on acceptance. Accordingly, the sensory test was carried out in three steps:

- Firstly, children were offered the six juice types in random order and asked to taste them in blind condition without information (Blind liking, B).
- Secondly, children received a sheet that contains the description of the juice and were asked to carefully read the information and state their “Expected liking” (E) without tasting. Expectations were differentiated using two nutritional claims in the case of NEC and STV juices; “Non-added sugar” (NEC_NO and STV_NO) and “with sweetener” (NEC_SWE and STV-SWE).
- Thirdly, children were given the juices to taste but with the information that allowed them to identify the juices tasted (Actual liking, A).

2.2. The children’ questionnaire at school

In the **second stage**, children answered an additional questionnaire in their classroom with the support of their teachers (afternoon in the same day of the sensory tasting). The questionnaire collected data regarding children consumption behaviour, opinions about healthiness of juice beverages, if they read food label, time spent on videogames, sports activities, number of hours watching TV, weight and height (Body Mass Index). In this Stage, the Food Neophobia was also collected using an adapted form of the Children Food Neophobia Scale proposed by Laureati *et al.*, (2015). The scale consists of 8 items with four positive and four negative statements towards FN. The FN indicator was calculated by summing all the ratings of positive statements with reversed scores of the negative one.

2.3. The parents’ questionnaire at home

In the **third stage**, parents of children answered a third questionnaire (at home) received the same day of the experiments. Parents evaluated the FN of their Children and answered the Children’s Eating Behavior Questionnaire Scale (CEBQ) which is designed to investigate the early precursors of obesity (Wardle *et al.*, 2001). The CEBQ is a parent-report measure consisted of 35 items with eight dimensions: Food responsiveness, Emotional over-eating, Enjoyment of food, Desire to drink, Satiety responsiveness, Slowness in eating, Emotional under-eating, and Food fussiness. Parents were asked to score on a 7-points Likert type scale the different items that better describe the eating behaviour of their children.

3. Results

Results of the hedonic evaluation in blind condition showed the highest global acceptance for STV juice and the lowest for the NEC. The highest sweetness scores were given to the fresh squeezed juices compared to the commercial one. This was related to the Navelina variety and sweeteners added. Juices that do not include additional unfamiliar ingredients (SQU, NAT and SGR) received the highest expectations for all sensory attributes. The lowest expectations were obtained for the NEC juice. The proposed nutritional claims had a significant impact on the expectation scores of NEC juice. The NEC-NO received higher expectation than the NEC-SWE, showing that the claim “non-added sugar” played a relevant role affecting expectations in the case of nectar juice. However, non-statistical difference were found between STV-NO and STV-SWE, showing positive expectation of using Stevia as a natural plant sweetener whatever the claim used.

According to the expectancy-disconfirmation model, results showed negative disconfirmation of the NEC and the STV juices. Children had lower expected liking than the blind one, confirming the importance of the information, in this case the sweetener information, in creating the sensory perceptions. Results of the FN showed that children were on average not neophobic, with similar outcome of that extracted from their parents which was positively and significantly correlated. In this context, results showed that the expected acceptance of STV juice was highly related to FN, confirming their unfamiliarity with the Stevia ingredient as sweetener.

4. Conclusions

Results showed that the use of the “non-added Sugar” claim was superior to “with sweetener” for nectar juice enriched with *Sucralose* sweetener (E-955). However, this superiority was non-significant in the case of Stevia as natural plant sweetener. This outcome offers to juice companies the opportunity to improve the perception of their nectar products. Our results showed the sensibility of children between 9

and 11 years to the information provided on label. Their Food Neophobia was a conditioning personality trait that affected their expected acceptance of unfamiliar ingredient in juice.

5. Reference

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