



## SENSORIAL ANALYSIS OF FUNCTIONAL PREPARATIONS DEVELOPED FOR 9 TO 15 YEARS OLD STUDENTS FROM CAMPINAS / SP

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### Abstract

The objective of this work was to evaluate the acceptance of functional food preparations developed for school-age children, confirming the possibility to insert them in school menus and contribute to the "Programa Nacional de Alimentação Escolar" (PNAE). The preparations were elaborated in the "Departamento de Alimentação Escolar da CEASA/CAMPINAS", being: orange cake with green banana biomass, avocado cream with cacao, gelatin with whole grape juice and fruit salad with yacon potato. The centesimal composition was determined and functional activity was evaluated analysing the prebiotic capacity, total phenolic compounds and antioxidant activity. In the sensorial analysis, it was observed that two functional preparations were accepted. As a conclusion, food and nutrition education combined with the introduction of functional preparations is indispensable to encourage the creation of healthy eating habits.

**Key words:** School feeding; Functional foods; Sensorial analysis.

### Introduction

The "Programa Nacional de Alimentação Escolar" (PNAE) recommend the construction of healthy eating habits to increase the learning capacity<sup>2</sup>. The Hedonic Scale (HS) and Rest Ingestion (RI) in indicated to evaluate the food acceptability of schoolchildren, to impact on the quality of food served and to reduce wastage<sup>1</sup>. The supply of functional foods represents an interesting strategy to increase the health of the PNAE menus. Therefore, the present study evaluates the acceptance and functional activity the preparations of children in school-age of Campinas/SP, aiming replace the conventional preparations that have been served.

### Results and Discussion

The table 1 represents the results of centesimal composition of the functional preparations.

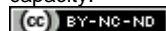
Preparations	Humidity	Ashes	Carbohydrates	Lipids	Proteins
Orange cake with green banana biomass	32,62%	0,85%	72,48%	24,7%	2,82%
Fruit salad with yacon potato	85,04%	0,32%	98,93%	0,3%	0,77%
Gelatin with whole grape juice	89,91%	0,46%	96,35%	0%	3,65%
Avocado cream with 32% cacao	73,7%	0,69%	84,87%	14,06%	1,07%

**Table 1.** Centesimal composition of functional preparations

The *Folin-Ciocalteu* spectrophotometer method was applied to analyzed the total phenolic compounds and the ABTS, FRAP and DPPH to determine the antioxidant capacity. The results were compared with the conventional preparations and shows no significant difference between the orange cake and the fruit salad samples, except for the orange cake in DPPH. However, in all the analyzes, the grape gelatin and the avocado cream samples proved a significant difference (P value <0,1) compared to conventional preparations.

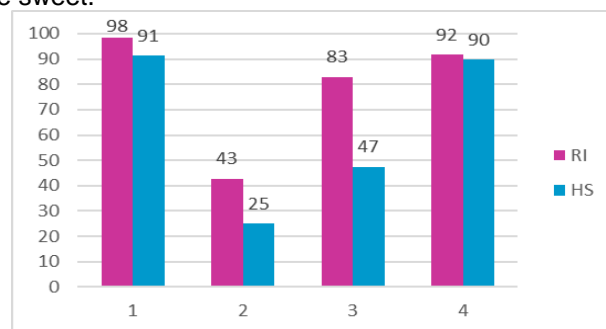
Preparations	Analyzes	Conventional	Functional	P value
Orange cake	Total Phenolics (mg Eq AG/g)	0,42±0,04	0,57±0,12	0,09
	ABTS (mM Trolox/g)	1,83±0,25	1,90±0,18	0,6
	FRAP (mg Eq FeSO4/g)	3,86±0,23	5,05±1,06	0,13
	DPPH (mM Trolox/g)	0,48±0,03	0,72±0,02	<0,1
Fruit salad	Total Phenolics (mg Eq AG/g)	1,74±0,31	1,65±0,15	0,7
	ABTS (mM Trolox/g)	4,64±1,05	4,92±0,18	0,7
	FRAP (mg Eq FeSO4/g)	17,37±0,62	15,73±1,20	0,1
	DPPH (mM Trolox/g)	3,0±0,84	3,55±0,16	0,32
Grape gelatin	Total Phenolics (mg Eq AG/g)	0,60±0,18	1,88±0,20	<0,1
	ABTS (mM Trolox/g)	4,26±1,79	9,26±1,01	<0,1
	FRAP (mg Eq FeSO4/g)	11,37±0,20	25,05±2,23	<0,1
	DPPH (mM Trolox/g)	2,85±0,09	6,21±0,72	<0,1
Avocado cream	Total Phenolics (mg Eq AG/g)	1,17±0,03	2,80±0,51	<0,1
	ABTS (mM Trolox/g)	6,85±0,09	18,48±1,37	<0,1
	FRAP (mg Eq FeSO4/g)	9,73±0,30	34,67±4,27	<0,1
	DPPH (mM Trolox/g)	4,02±0,19	8,50±0,66	<0,1

**Table 2.** Determination of total phenolic compounds and antioxidant capacity.



To determine prebiotic capacity, MRS agar were formulated with green banana biomass and yacon potato replacing the carbohydrate source. The growth of *Lactobacillus spp* and *Bifidobacterium spp* was evaluated and both ingredients allowed the growth of the probiotics, confirming their prebiotic activity.

The Figure 1 represents the results of the sensory analysis, demonstrating that orange cake with green banana biomass and fruit salad with yacon were sensorial approved by students, while avocado cream with 32% cocoa and the gelatin with whole grape juice were disapproved. In addition, in the comments of the HS showed that the students have a paladar conditioned to the sweet.



**Figure 1.** Acceptability percentage: orange cake with green banana biomass (1); avocado cream with 32% cacao (2); gelatin with whole grape juice (3); fruit salad with yacon (4); Rest Ingestion (RI); Hedonic Scale (HS).

### Conclusions

The functional preparations with addition of prebiotics and phenolics sources demonstrated nutritional benefits when compared to conventional preparations. Thereby, the inclusion on student's food can lead improvements in health, learning capacity and disease prevention. However, this inclusion in recipes that the students were already familiar, did not secured the acceptability of all formulations. Food and nutritional education strategies added by healthy food are necessary to ensure the formation of healthy eating habits.

### Acknowledgement

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<sup>1</sup> BRASIL. Ministério da Educação. Fundo Nacional de Desenvolvimento da Educação (FNDE). Programa Nacional de Alimentação Escolar, 2005.

<sup>2</sup> PHILIPPI ST. Guia alimentar para o ano 2000. In: Angelis RC de. **Fome Oculta**. São Paulo: Atheneu; 2000. cap. 32, p. 160-76.