# Characterization of breakfast habits among Portuguese school-aged children - Missão Continente School Program 2021/2022

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## Introduction

Breakfast is a crucial component of a healthy diet for children necessary for their growth and development [1]. Research on the frequency of breakfast consumption shows varying results depending on factors such as age, gender, population, and the definition of breakfast [2]. However, some studies suggest a link between skipping breakfast and childhood obesity/overweight [3,4]. Portuguese children tend to consume breakfast cereals and dairy products [5]. The location where children eat breakfast should also be considered, as it affects food availability and context, with most children eating breakfast at home [6].

## Objective

This study aims to evaluate and understand the breakfast habits of children who participated in the Program Escola Missão Continente (EMC) [7] in relation to frequency, place, and composition, and to determine if there is a correlation with their nutritional status based on Body Mass Index (BMI) classification taking into account the World Health Organization (WHO) Growth Reference for children aged 5 to 19 years old [8].

## Methodology

As part of the EMC Program, a cross-sectional analysis was conducted in the 2021/2022 school year, with a sample of 573 children (51,5% male, ages 6-8) from 35 schools in all districts of mainland Portugal and the autonomous regions of the Azores and Madeira. Anthropometric data (weight and height) were collected to assess nutritional status, using the classification of BMI according to the growth curves reference from the WHO for children aged 5 to 19 years. Characterization of breakfast habits was done through a questionnaire applied to guardians with questions related to life style of the children and household. The *Chi-Square* $x^2$ statistical test was applied for hypothesis testing, with statistical significance when $p<0,05$.

## Results

### Frequency

**Table 1.** Relationship between frequency of breakfast consumption and nutritional status | Pearson's Chi-square test χ2.

| | | Frequency | | |
|---|---|---|---|---|
| | | Eat breakfast every day of the week (n=530) | Don´t eat breakfast every day of the week (n= 31) | *p Value* |
| Nutritional status, n (%) | Underweight | 9 (1,7) | 2 (6,5) | ***0,010*** |
| | Normal weight | 376 (70,9) | 14 (45,2) | |
| | Overweight | 90 (17,0) | 8 (25,8) | |
| | Obesity | 55 (10,4) | 7 (22,6) | |

The majority of children who consume breakfast every day of the week have a "normal weight" classification (70,9%), while children who do not consume breakfast every day have a higher prevalence of “overweight" (25,8%) and "obesity" (22,6%). This indicates that children who do not consume breakfast every day are more likely to be in a state of "pre-obesity" or "obesity“, ($p<0,05$).

### Place

**Table 2.** Relationship between the place of breakfast consumption and nutritional status | Pearson's Chi-square test χ2.

| | | Place of consumption | | |
|---|---|---|---|---|
| | | At home, n (%) | Away from home, n (%) | *p Value* |
| Nutritional status | Underweight (n=11) | 10 (90,9) | 1 (9,1) | *4,032* |
| | Normal weight (n=385) | 371 (96,4) | 14 (3,6) | |
| | Overweight (n=99) | 92 (92,9) | 7 (7,1) | |
| | Obesity (n= 61) | 60 (98,4) | 1 (1,6) | |

The majority of children consume breakfast at home, and there is a higher prevalence in all nutritional status classifications. However children who have "obesity" (98,4%) also showed a higher prevalence of consuming breakfast at home. ($p>0,05$).

### Composition

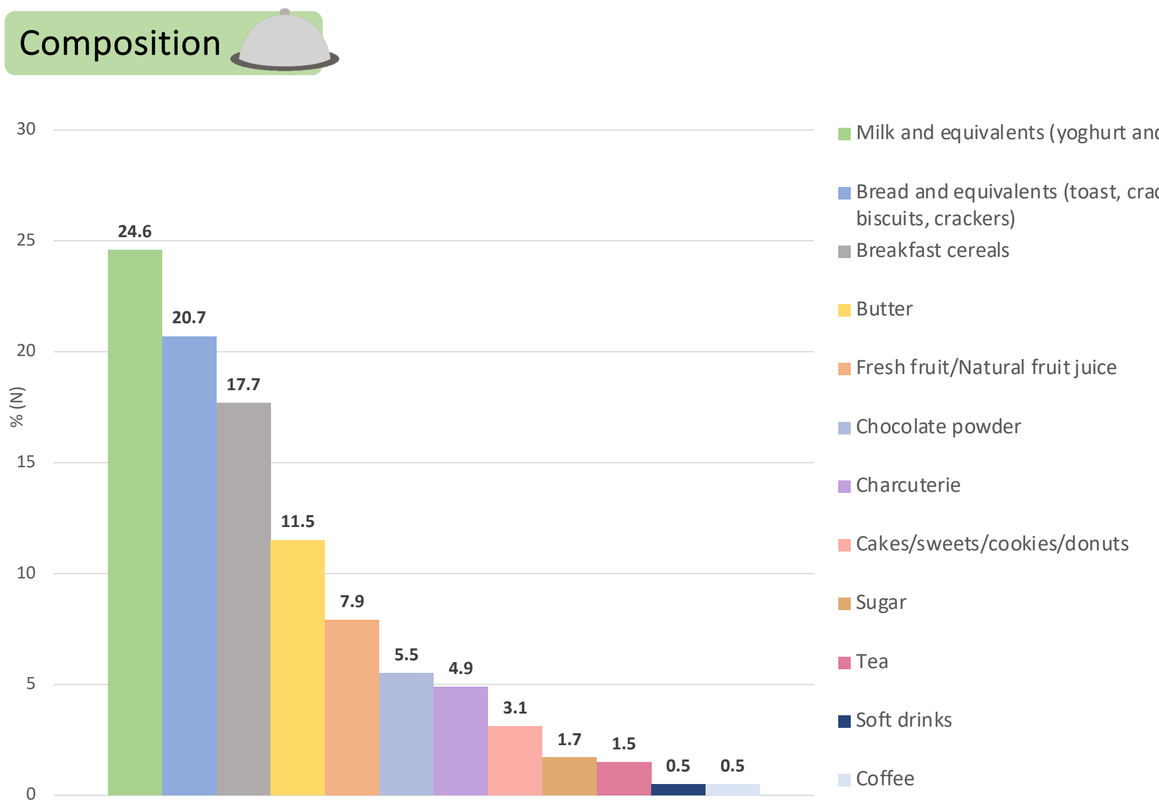


**Figure 1.** Food products consumed at children breakfast.

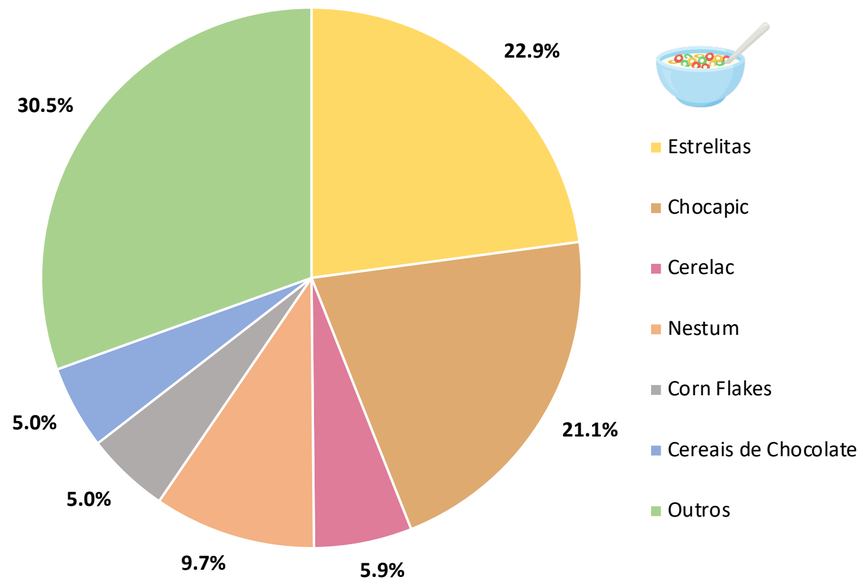


**Figure 2.** Types of Breakfast Cereals consumed at children breakfast.

The most consumed foods in breakfast among children are milk and equivalents (24,6%), followed by bread and equivalents (20,7%), and breakfast cereals (17,7%). As regards “Breakfast cereals” the most consumed, excluding the "Other" category due to its diversity or lack of identification, were "Estrelitas" (22,9%) followed by "Chocapic" (21,1%) among children who consume cereals. Children with a “overweight" nutritional status had a higher frequency of cereal consumption at breakfast (60,2%).

**Table 3.** Relationship between cereal consumption and nutritional status | Pearson's Chi-square test χ2.

| | | Consumption of breakfast cereals | | |
|---|---|---|---|---|
| | | Yes, n (%) | No, n (%) | *p* Value |
| Nutritional status | Underweight (n=11) | 6 (54,5) | 5 (45,5) | *0,938* |
| | Normal weight (n=396) | 230 (58,1) | 166 (41,9) | |
| | Overweight (n=103) | 62 (60,2) | 41 (39,8) | |
| | Obesity (n=63) | 35 (55,6) | 28 (44,4) | |

## Conclusion

The frequency of breakfast consumption has been shown to be a predictor of health, since children who reported a daily consumption, presented normal weight and in contrast, children who didn’t consume this meal on a daily basis showed overweight. Regarding the location and composition of breakfast weren’t statistical related to nutritional status, further studies are necessary with regard to the location, in order to better identify whether it has an influence on the food choices and consequent changes in nutritional status. On the other hand, with regard to composition, this needs to be assessed not only qualitatively, but also quantitatively, so that a better understanding can be achieved whether it is the food or the quantity of food that is consumed that causes changes in children's nutritional status.

## References

[1] Kawalec A, Pawlas K. Breakfast frequency and composition in a group of polish children aged 7–10 years. Nutrients 2021; 13. doi:10.3390/nu13072241.
[2] Inchley J, Currie D, Budisavljevic S, Torsheim T, Jåstad A, Cosma A et al. Spotlight on adolescent health and well-being. Findings from the 2017/2018 Health Behaviour in School-aged Children (HBSC) survey in Europe and Canada. International report. Volume 1. Key findings. WHO Reg Off Eur 2020; 1: 58.
[3] Yaguchi-Tanaka Y, Tabuchi T. Skipping Breakfast and Subsequent Overweight/Obesity in Children: A Nationwide Prospective Study of 2.5- to 13-year-old Children in Japan. J Epidemiol 2021; 31: JE20200266.
[4] Ricotti R, Caputo M, Monzani A, Pigni S, Antoniotti V, Bellone S et al. Breakfast skipping, weight, cardiometabolic risk, and nutrition quality in children and adolescents: A systematic review of randomized controlled and intervention longitudinal trials. Nutrients 2021; 13. doi:10.3390/nu13103331.
[5] Rito A, Dinis A, Rascôa C, Maia A, Carvalho I, Santos M et al. Improving breakfast patterns of portuguese children — an evaluation of ready-to-eat cereals according to the European nutrient profile model. 2018. doi:10.1038/s41430-018-0235-6.
[6] Tin SPP, Ho SY, Mak KH, Wan KL, Lam TH. Location of breakfast consumption predicts body mass index change in young Hong Kong children. 2012; : 925–930.
[7] CEIDSS. (n.d.). Escola Missão Continente. Retrieved April 23, 2022, from https://www.ceidss.com/pt/escola-missao-continente/.
[8] World Health Organization. (2007). WHO Child Growth Standards: BM1 Curves 5-19 years. Retrieved April 23, 2022, from https://www.who.int/growthref/who2007_bmi_for_age/en/.