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Research

Conference on Sustainable Health and Nutrition During the Life Cycle: Keynote Sessions and Oral Presentations

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Abstract OP001

Nurturing Palates and Minds - A Gastronomic Education Initiative at the 1st International Conference on Sustainable Health and Nutrition

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At the 1st International Conference on Sustainable Health and Nutrition during the Life Cycle, held in Rio de Janeiro from March 19th to 21st, 2024, our team of undergraduate nutrition students from Rio de Janeiro State University (UERJ) led a nutritional and gastronomic education activity. Through this innovative educational activity, seamlessly integrated into the conference's coffee break, we aimed to offer participants a flavorful journey into unconventional foods and sustainable culinary practices (Figure 1).

Figure 1. Conference coffee break

The menu was carefully selected to showcase the versatility and potential of unconventional foods sourced from small local agroecological producers from the state of Rio de Janeiro. Each day, participants were offered one sweet and one savoury recipe, carefully prepared to highlight the unique flavours and textures of ingredients often overlooked in mainstream cuisine (Figure 2).

Figure 2. Ora Pro Nobis cake.

The culinary journey began with cassava and banana on the first day, followed by Ora Pronobis and three varieties of sweet potato on the second day, and culminated with corn as the key ingredient on the third day. To complement these dishes seasonal fruits and a selection of beverages, including organic coffee, flavoured water with natural fruits and herbs, and freshly squeezed juices made from locally sourced fruits were also served (Figure 3).

Figure 3. Seasonal fruits and beverages

Central to the experience were the educational components integrated into every element of the activity. Each day, a banner tracing the journey of our main ingredients from farm to fork and intriguing facts about the produce was displayed (Figure 4). This sparked conversations among their audience and the research team form of nutrition students about sustainable food systems (Figure 5). Additionally, the recipes of the food were displayed, motivating attendees to recreate the dishes in their own kitchens and embrace sustainable culinary practices.

Figure 4. Ora Pro Nobis from farm to fork

Figure 5. Fostering Dialogue: Exploring Sustainable Food Systems through Interactive Education

Behind the scenes, the students delved into extensive research to develop the material, under the supervision of two academics (DMS and FSBB) (Figure 6). This collaborative effort not only enriched their academic learning but also fostered a deeper connection to the principles of sustainability and nutrition in action.

Figure 6. Academic Collaboration and Cultivating Knowledge and Practice in Sustainability and Nutrition

Furthermore, our commitment to sustainability extended to our choices in materials and operational practices. Conscious efforts were made to minimise environmental impact aligning our actions with the principles of sustainability that underpinned the conference. Unfortunately, due to budget constraints and a lack of washing-up facilities, we were not able to use non-disposable cutleries and we had to opt for recyclable disposable materials.

The impact of our initiative extended beyond the conference venue, leaving a lasting impression on participants. Participants not only enjoyed the culinary delights but also gained a new appreciation for the richness and diversity of unconventional foods. Moreover, the educational elements inspired individuals to explore sustainable culinary practices in their personal and professional lives.

In conclusion, our nutritional and gastronomic education activity led by undergraduate nutrition students at the 1st International Conference on Sustainable Health and Nutrition stands as a testament to the transformative power of food. Through our harmonious blend of flavour, education, and sustainability, we hope to cultivate a healthier, more sustainable future.

WPHNA

Abstract OP002

Forecasting a rise in childhood obesity in Brazil

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INTRODUCTION

Brazil has conducted many surveys to estimate the growing prevalence of obesity, but only two of them included children. The most recent one is the National Child Nutrition Survey (*Estudo Nacional de Alimentação e Nutrição Infantil -ENANI*), conducted in 2019, with children up to four years of age. The estimated prevalence of obesity and undernutrition in the ENANI were almost the same, 3.9% for undernutrition and 4.0% for obesity. Between 2000 and 2019, Brazil experienced a rise in low birth weight cases, showing an annual percentage increase of 0.4 (95% CI 0.3 to 0.5) (Pereira et al. 2023).

The Brazilian National Health Survey (PNS), conducted by IBGE in 2019 (IBGE, 2020), assessed anthropometric data from a national sample of adults over 20 years old. A subsample of 7,060 households, focused on adolescents aged 15 to 17 years (Table 1). The prevalence of obesity among adolescents is below 10%, whereas among adults, it has reached 30%.

Table 1. Weight excess and obesity in Brazil. National Health Research (*Pesquisa Nacional de Saúde -PNS*), 2019

	Male	Female
Adolescents		
Overweight	16.0	22.9
Obesity	5.4	8.0
Adults		
Overweight	60.0	63.3
Obesity	22.8	30.2

Household food insecurity has significantly increased in Brazil, exacerbated by the COVID-19 pandemic. By the end of 2020, 55.2% of Brazilian households were experiencing some degree of food insecurity, with 9% facing hunger. This prevalence of food insecurity increased by almost 30% compared to levels observed in 2018 (Rede Penssan, 2022).

Thus, nutrition indicators reveal a double burden of malnutrition in Brazil. The combination of food insecurity, with a high prevalence of obesity, particularly among women underscores this challenge. Moreover, the rising of low birth weight, along with nearly equivalent rates of undernutrition and obesity among children up to four years of age, presents additional risks for obesity in later years. There is strong evidence that either undernutrition or overnutrition during development can predispose individuals to disease later in life, especially type 2 diabetes and obesity, a concept known as metabolic programming (Donato, 2023).

The double burden of malnutrition in Brazil is more frequent among children of mothers in greater social vulnerability. A cohort of children from low-income families showed that children's weight and length from Indigenous, Brown, and Black mothers were on average shorter and weighted less than White ones (Matos da Silva, 2024). The racial factor holds particular significance in Brazil, given that individuals of Brown and Black descent constitute 51% of live births in the country (IBGECensus, 2010).

The association of vulnerability and obesity among adults was also shown in an analysis of the national survey 2017-2018. In this survey, the family classification as food insecure (FI) based on the Brazilian Household FI Scale (EBIA) was associated with underweight and obesity in adults 20 to 60 years. Women with severe FI were more than twice as likely to be underweight and had a higher frequency of obesity. Among men, severe FI status was a risk factor for underweight and a protective factor for overweight, and obesity. In conclusion, FI was a risk factor for underweight and obesity among women (Domingos et al., 2022).

As a complication of this complex figure of the relation of vulnerability, metabolic programming and public policies, in a review of nutritional interventions, two studies of conditional cash transfers suggested beneficial effects on the double burden of malnutrition in children, whereas one indicated potentially harmful effects on maternal overweight (Nora et al.,2024).

Trends in food intake also indicate an increasing risk for obesity due to unhealthy eating as shown in Figure 1. Values are the difference in the mean intake of food groups by adolescents, comparing 2018 to 2008. Most traditional items of diet showed a reduction, juice replaced the sodas and fast food increased by 17 g on average.

In the Northeast region, which is the region with the highest prevalence of food insecurity in Brazil, dietary patterns identified in 2008-2009 and 2017-2018 also indicate that traditional dietary pattern is combined with unhealthy items. Thus, in the period, patterns were quite similar and traditional patterns based on rice/beans and meat were almost as important as a pattern called snacks, in which most contributing food groups were: snacks, bread, juices and sodas, sweets and candies (Machado et al, 2024).

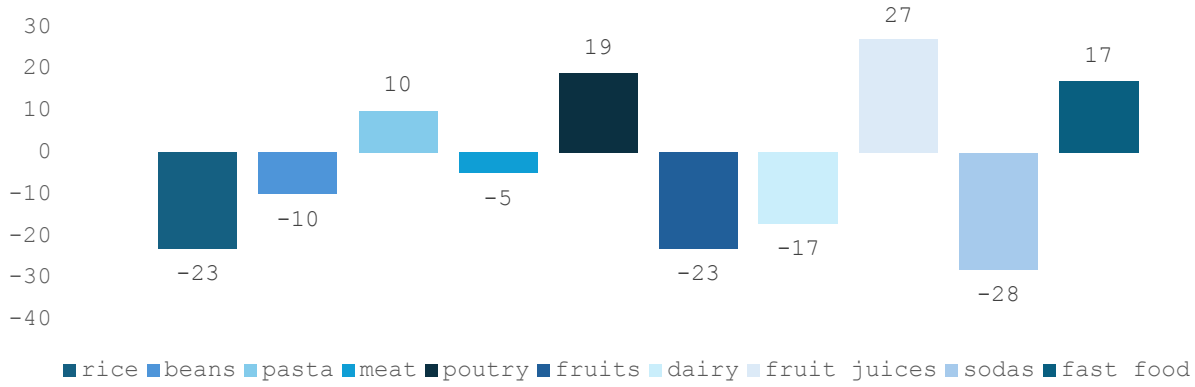

Figure 1. Mean difference in g of food groups intake by Brazilian adolescents, from 2008 to 2018. National dietary surveys
Source: Rodrigues et al., 2021

CONCLUSION

In conclusion, the convergence of high rates of food insecurity, a rising frequency of low birth weight, over half of children born to mothers facing greater social vulnerability, and a shift away from traditional dietary patterns in Brazil all point towards an increase in obesity, potentially extending into the next generation.

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Graduated in Medicine from the Faculty of Medical Sciences of Botucatu (1976), specialization in Public Health from the University of São Paulo (1978), Master's degree in Science (Human Physiology) from the University of São Paulo (1981) and PhD in Nutrition in Public Health from the University of São Paulo (1988). She completed a post-doctorate in Epidemiology in 1990 at the NIH-USA and in 2002 and 2012 at the Harvard School of Public Health. She is currently a full professor at the State University of Rio de Janeiro (UERJ). She has experience in the area of Nutrition, with an emphasis on Population Nutritional Analysis, working mainly on the following topics: obesity, adolescents, overweight, nutrition and food consumption.

Abstract OP003

Prevention of childhood obesity – is it Possible?

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INTRODUCTION

At the age of seven, most children have a healthy weight. Indeed, in Europe for instance, about 3-5% of children have obesity, and 12-18% have overweight (1). By the age of 50, 50-70% of the same population is expected to have developed overweight or obesity (2) (Figure 1). While we know that parental obesity, low socioeconomic status, a high and a low birthweight as well as smoking during pregnancy are strong risk factors for offspring obesity at age 7 years (3), we are generally unable to predict, based on children's diet and physical activity level, who among those children with a healthy weight will develop overweight and obesity later in life (4)

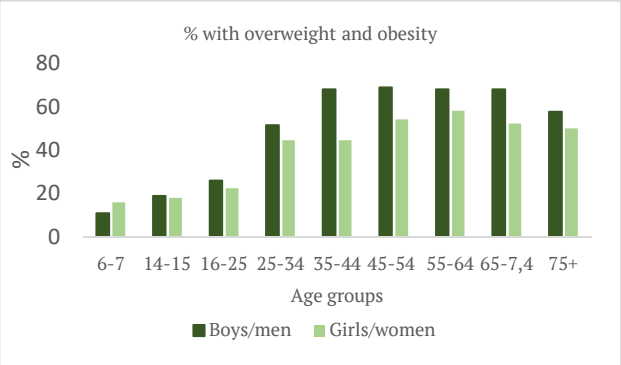

Figure 1. Prevalence of overweight and obesity in Denmark by age group.
Footnote: Adapted from (1) and (2).

OVERWEIGHT AND OBESITY PREVENTION IN CHILDREN

Primary obesity prevention aims to prevent excessive weight gain among individuals with a healthy weight, while tertiary prevention focuses on treating obesity to achieve weight loss. Secondary prevention involves halting and reversing excessive weight gain among those who are overweight. Interestingly, there have been few primary prevention initiatives undertaken to prevent overweight among healthy-weight children or adults (4). While one such study exists (5), there do not currently seem to be results from other published studies (4). This can seem paradoxical given the numerous randomized obesity prevention interventions that have been published aiming to prevent overweight and obesity in children, as summarized by the Cochrane Group and others (6). Although 75-80% of the summarized interventions found no effects (4), meta-analyses suggested small intervention effects of a 200-300 g difference between intervention and control groups over 1 year (6). Many reviews, including those from the Cochrane group, have concluded that diet and/or physical activity interventions, compared with control, can reduce the risk of overweight and obesity in different age groups of children (6).

However, none of the previously summarized interventions were restricted to targeting children with a healthy weight (4, 7). Instead, the trials were conducted among mixed groups of children, some with a healthy weight and others with overweight or obesity. It can therefore be questioned whether the previous studies that were effective, prevented overweight from developing among children with a healthy weight or rather treated those children already overweight or obese.

There is some support for the latter. For instance, the IDEFICS intervention, a controlled, non-randomized, community-oriented intervention conducted in eight European centres involving 16,228 boys and girls aged 2-10 years (8). This 2-year intervention focused on increasing consumption of water, fruit, and vegetables, reducing sedentary screen time, increasing physical activity, increasing family time, and improving sleep quality and duration. While there was no overall effect of the IDEFICS intervention among the 11,041 boys and girls who completed it, secondary analysis showed that intervention effects differed among the approximately 9,000 children initially of a healthy weight and those approximately 2,000 with overweight or obesity (9). The emerging picture was a treatment effect seen in those children initially with overweight or obesity who lost weight during the 2-year intervention period to become leaner, while the healthy weight children, on average, remained at a healthy weight over the 2 years, suggesting no intervention effect in the 9,000 children with a healthy weight. The authors concluded that while there was evidence of a differential effect of the IDEFICS intervention, in which children with obesity may have benefited without being specifically targeted, there was no overall primary preventive effect observed in children without initial overweight or obesity. It is similarly possible that the 20-25% of previous interventions that were effective treated those already overweight or obese rather than prevented excessive

weight gain among those initially healthy weight (4).

CONCLUSION

We clearly need interventions conducted solely among children with a healthy weight and targeting this specific population to prevent overweight development. We also need primary prevention interventions to target factors other than diet and activity, as there is little evidence to suggest such interventions will be successful in healthy-weight children. Finally, with the several hundred well controlled randomized intervention studies already conducted among children, there does not seem to be a need for more intervention studies to prevent overweight and obesity in mixed-weight population groups of children and adolescents.

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WPHNA

Abstract OP004

Impact of a multi-behavioural obesity prevention intervention in early childhood

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Keywords: intervention, dietary and movement behaviours, obesity prevention, early childhood

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INTRODUCTION

Lifestyle behaviours including dietary intake, physical activity, and sedentary behaviours are well-known risk factors for obesity (Woo Baidal et al., 2016). Compelling evidence suggests lifestyle behaviours originate in early life and are tracked across the lifespan (Zheng et al., 2021). Promoting healthy lifestyle behaviours from early life is imperative for early obesity prevention and health promotion (Weng, Redsell, Swift, Yang, & Glazebrook, 2012)

OBJECTIVE

To evaluate the impact and sustainability of an infancy multi-behavioural intervention to improve lifestyle behaviours and obesity outcomes in early childhood.

METHODOLOGY

The Melbourne INFANT program (n=542) is a 15-month cluster randomised controlled trial involving mothers and their 3-month-old infants. First-time mothers and infants were recruited from first time parent groups from Melbourne, Australia. The intervention involved dietitian delivered education sessions to promote healthy lifestyle behaviours (healthy eating and active play) from infancy. The control group received usual care. Participants were followed up at the end of the intervention when infants were age 1.5 years and post-intervention when they were 3.5 and 5 years of age. Three 24-hour dietary recalls, accelerometers, and parental questionnaires measured lifestyle behaviours and demographic variables. Child length/height and weight were objectively measured by standardised protocols. Body mass index (BMI) z-scores were calculated from age- and sex-specific WHO growth charts. Principle component analysis identified integrative unhealthy and healthy lifestyle patterns. Random effect linear regression models were conducted to assess the impact of the intervention on lifestyle behaviours and obesity outcomes.

RESULTS

Relative to the control group, the intervention group had a lower sweet snack intake at ages 1.5, 3.5 and 5.0 years ($P<0.05$). Intakes of fruits, vegetables, and water at age 3.5 years were higher in the intervention group than in the control group($P<0.05$). Infants from the intervention group watched less television at age 1.5 years and consumed less sweet snacks at age 5 years($P<0.05$). Two integrative lifestyle patterns were identified: a healthy lifestyle pattern characterised by intakes of fruits and vegetables, and outdoor playtime; and an unhealthy lifestyle pattern characterised by intakes of energy-dense and nutrient-poor discretionary foods and television viewing time. The intervention group had a lower unhealthy "discretionary food and television" lifestyle pattern score at ages 1.5 and 3.5 years than the control group ($P<0.05$). No evidence of between-group differences was found for savoury snack intake, physical activity, the healthy "fruit, vegetable, outdoor play" lifestyle pattern, and BMI z-score.

CONCLUSION

A low-dose multi-behavioural intervention delivered in infancy is effective at improving lifestyle behaviours, particularly unhealthy behaviours including intake of discretionary foods and television viewing time, and effects are sustained after the conclusion of the intervention. The study highlights the importance of initiating multi-behavioural interventions to promote the establishment of healthy lifestyle behaviours from the start of life.

FUNDING

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Dr Zheng is a senior research fellow at the Institute for Physical Activity and Nutrition (IPAN), Deakin University. She is an Accredited Practising Dietitian and Nutrition Epidemiologist with in-depth knowledge in dietary assessment and biostatistics. Dr Zheng's current research focuses on applying innovative statistical and machine learning approaches to understand the role of dietary and behavioural factors in the early origins of health and diseases including obesity, cardiovascular disease, and emotional behavioural problems. Her research is supported by an Australian National Health Medical Research Council (NHMRC) Early Career Research Fellowship and an Australian Research Council Discovery Early Career Researcher Award (ARC DECRA) fellowship. She is the co-lead of the "Promoting health in the first 2000 days" research group within IPAN.

Abstract OP005

Relationship between maternal sociodemographic characteristics and children's intake of ultra-processed Food

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Keywords: Food consumption; Mothers; Ultra-processed foods; Sociodemographic factors.

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INTRODUCTION

Over the past few decades, there has been a shift in people's eating habits away from traditional home-cooked meals towards a diet characterized by readily available ultra-processed foods (UPFs) (IBGE, 2020). This trend is not limited to Brazil alone but is also observed worldwide (Monteiro et al., 2019). Studies have shown that UPF consumption is often influenced by the social and family environment. Mothers play an important role in shaping their children's eating habits, and the environment that mothers create for their children can either promote healthy eating habits or negatively affect their nutrition, leading to unhealthy eating behaviours and weight gain (Vila et al., 2015; Brito et al., 2024). Studies have investigated the factors that influence children's consumption of UPF (Silva et al., 2019; Cainelli et al., 2021). However, it is important to understand how maternal sociodemographic factors influence children's eating habits. This knowledge may help to establish guidelines to promote healthy eating habits during childhood.

OBJECTIVE

To explore how maternal sociodemographic factors correlate with increased consumption of ultra-processed foods (UPF) in children

METHODS

A cross-sectional and descriptive study was conducted among 154 mothers of children aged 2–5 years registered in a primary health care unit in Rio de Janeiro, Brazil. Data were collected using a questionnaire on children's UPF consumption on the previous day and maternal sociodemographic factors. Children's UPF consumption score was derived from the sum of all positive responses (yes) to a list of 11 UPF groups. Based on the distribution of UPF consumption scores, children were classified as having "higher consumption" if the UPF consumption score was above the 75th percentile (> five food groups). The questionnaire also included questions on maternal sociodemographic factors. Descriptive statistics are presented as relative frequency (%) or as mean and standard deviation (SD). Associations between maternal sociodemographic factors and children's UPF consumption in children on the previous day were investigated using a Poisson regression model with robust variance adjustment. Crude and adjusted prevalence ratios (PR) and their respective 95% confidence intervals (95% CI) were estimated.

RESULTS

Most mothers tended to be younger (75.3%), had more than nine years of education (74%), had two or more children (52.6%), were more likely to live with a partner (73.4%), less likely to be employed (72.4%), more likely to receive social benefits (51.9%), and more likely to have overweight BMI (66%). The children were an average of 3.9 (SD = 0.9) years old. We found that 84.5% of the children consumed at least one UPF on the previous day. Furthermore, the frequency of high consumption of UPFs (> 5 food groups) was 46.8% among children. The most frequent UFPs were sweetened or savoury biscuits (83.2%), followed by margarine (61.3%), and yoghurt (59.4%) (Figure 1).

Table 1 shows the adjusted associations between sociodemographic factors and high consumption of UPFs. Children of young mothers (PR=1.30, 95%CI=1.12-1.50), with fewer years of schooling (PR=1.26, 95%CI=1.11-1.42), who did not receive social assistance (PR=1.18, 95%CI=1.05-1.32), and who did not have an overweight BMI (⩾ 25 kg/m^2) (RP=1.13, 95%CI=1.02-1.26) were more likely to have high UPF consumption.

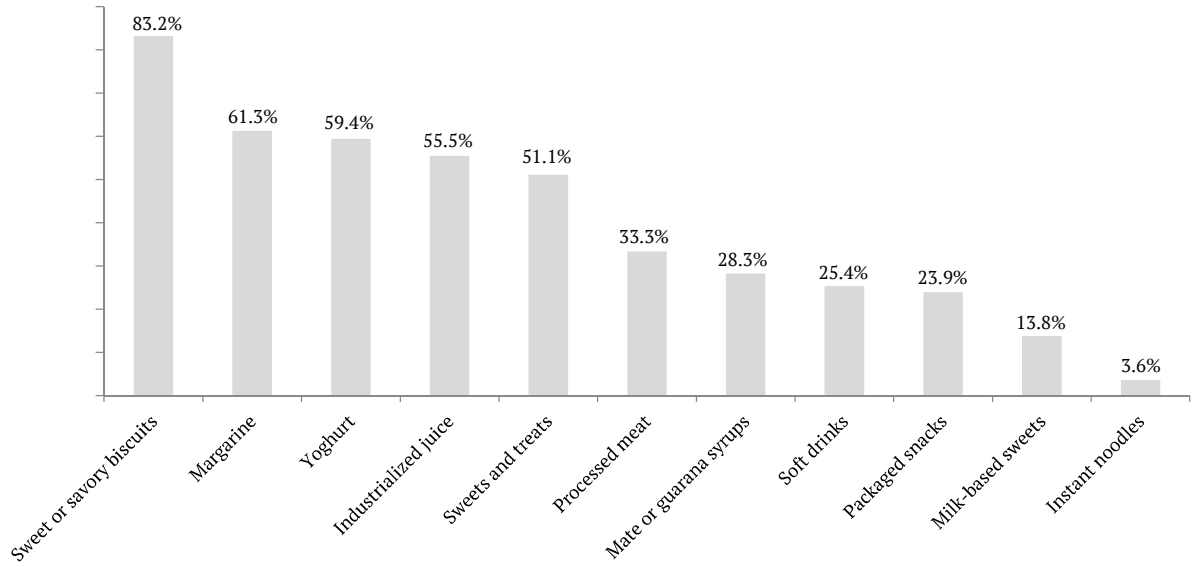

Figure 1. **Frequency (%) of consumption of selected subgroups of ultra-processed foods on the previous day among children aged 2-5 listed as users in a primary health care unit (n=154).** Rio de Janeiro, Brazil, 2017.
Source: Adapted from Brito et al., 2024

Table 1. Adjusted analyses between maternal sociodemographic factors and high ultra-processed food consumption (⩾ 5 food groups) among young children in a primary health care unit (n=154). Rio de Janeiro, Brazil, 2017

Variables	Adjusted[c,d]			
	PR	95%CI		*P*
Age (years)				
⩽ 35 years	1.30	1.12	1.50	0.01
> 35 years	1.00			
Education (years)				
< 9 years	1.26	1.11	1.42	0.01
⩾ 9 years	1.00			
Receipt of social assistance[a]				
No	1.18	1.05	1.32	0.01
Yes	1.00			
Overweight [b]				
No	1.13	1.02	1.26	0.02
Yes	1.00			

Source: Adapted from Brito et al., 2024
[a] *Nationwide conditional cash transfer program known as Bolsa Família.*
[b] *According to the World Health Organization Body Mass Index cut-off points: BMI ⩾ 25 kg/m2.*
[c] *The model included the child's age as a covariate.*
[d] *Omnibus test: P < 0.001.*

CONCLUSION

Our results show that high consumption of UPF was prevalent in this population of children and that younger mothers with fewer years of education, who do not receive social benefits, and who have a normal BMI are more likely to contribute to this increase. It highlights the need to implement intervention measures in primary health care to provide more educational information for mothers, including dietary guidelines, and promote healthy diets for their children. These findings also highlight the need for targeted policy strategies to improve the availability and accessibility of healthy and minimally processed foods.

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Abstract OP006

Dietary guidelines for Brazilian children up to 5 years of age and their current dietary intake according to the ENANI-2019 data

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INTRODUCTION

The Ministry of Health's guidelines on infant feeding include: continued breastfeeding for up to 2 years, being exclusively up to 6 months; at 6 months, start complementary feeding; diet should contain the various food groups; consumption of ultra-processed foods should be avoided in the first 2 years of life; juices should be avoided up to 1 year and limited after this age; and sugary foods should be avoided up to 2 years of age (Ministry of Health of Brazil, 2021).

The National Child Nutrition Survey (ENANI-2019) is a survey of 12,524 households with children < 5 years and 14,558 children (123 municipalities). Food intake on the previous day was assessed by a structured questionnaire with 41 questions. We calculated the prevalences of the "Indicators for assessing infant and young child feeding practices" from the World Health Organization (World Health Organization, 2021), and other indicators created based on Brazilian guidelines. The prevalences of the indicators and 95% confidence intervals were calculated for the 6–23 and 24–59 months age groups. The stratifiers analyzed were macro-region; household situation (urban/rural); quintiles of the National Economic Indicator (express a socioeconomic gradient); and skin color (no statistical differences found) (Federal University of Rio de Janeiro, 2021).

The prevalence of minimum food diversity, consumption of iron-rich foods (CIF), and consumption of flesh foods and eggs (CFE) were lower in the North and Northeast regions. The prevalences of CIF, CFE and plain water consumption were lower in the poorest children. The prevalence of consumption of vitamin A-rich foods was lower in rural areas. The prevalence of consumption of ultra-processed foods was higher in the North (6–23 months) and in the Southeast and among the richest children (24–59 months). The prevalence of zero consumption of fruits and vegetables was higher in the North, among poorer children and in rural areas. The prevalence of exposure to sugar was higher in the North region (Table 1).

The prevalence of unhealthy food markers (ultra-processed foods, zero fruits and vegetables and sugar exposure) was considered high and the prevalence of healthy food markers (minimum diversity of details, vitamin A and water consumption) was low. Children from the most vulnerable and poorest regions have the worst prevalence of indicators. ENANI-2019 serves as the basis for future comparisons and provides insights into adherence to infant feeding recommendations.

Table 1 – Prevalences of the child feeding practices indicators according to age groups (Brazil, 2019)

Indicators	Prevalences of the indicators (%)	
	6 – 23 months	24 – 59 months
Minimum dietary diversity	57,1	54,8%
Consumption of iron-rich foods	84,6	94,9
Consumption of vitamin A-rich foods	38,6	29,7
Consumption of flesh foods and eggs	71,4	88,9
Intake of plain water	72,1	66,9
Consumption of ultra-processed foods	80,5	93,0
Zero consumption of fruits and vegetables	22,2	27,4
Exposure to sugar	68,4	87,3

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WPHNA

Abstract OP007

The prevention of adverse pregnancy and birth related outcomes by periodontal treatment (PROBE) intervention study - A controlled intervention study: protocol paper

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Keywords: periodontitis, adverse pregnancy outcomes, low-grade systemic inflammation

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INTRODUCTION

Periodontitis is an oral disease characterized by inflammation and caused by bacteria. Scientific evidence is accumulating for associations between periodontitis during pregnancy and the development of pregnancy and birth-related complications. The systemic inflammation caused by periodontitis (Jain & Mulay, 2014) has in some studies been found as a potential risk factor for preterm birth, low birth weight (Bi et al., 2021; Le et al., 2022), development of preeclampsia and gestational diabetes (GDM) (Chambrone et al., 2011; Daalderop et al., 2018; Matevosyan, 2011). The mechanisms behind maternal periodontitis and these adverse pregnancy and birth-related outcomes are not fully known but seem to involve inflammation and altered hormone levels. The female sex hormones, progesterone and estrogen, stimulate key factors involved in the inflammatory response by changing the immune response and increasing the sensitivity towards periodontitis-associated pathogens and toxins within the periodontal tissue. An accompanying increased gingival vascular permeability in combination with the gingival inflammation may enhance the leakage of periodontitis-associated pathogens and proinflammatory cytokines from the infected periodontal tissues to the blood circulation. This may induce a low-grade systemic inflammation, which is shown as enhanced production and release of C-reactive protein and fibrinogen that is associated with both preterm birth and preeclampsia (Bobetsis et al., 2020). Also, an increased level of inflammatory mediators, cytokines and adipokines such as tumour necrosis factor (TNF)-a, interleukin (IL)-6, adiponectin and leptin, which are secreted by the adipose tissue, cause a systemic inflammatory state. The inflammatory pathogens increase the production of uterine stimulating factors, which affect the function of the placenta and the risk of adverse birth-related outcomes (Stødle et al., 2021).

AIM

The overarching aim of the PROBE study is to determine, whether periodontal treatment during pregnancy can reduce systemic inflammation and influence complications during pregnancy and fetal growth.

METHODS AND ANALYSIS

The PROBE study is a non-randomized controlled intervention study conducted among 600 pregnant women with periodontitis. Approximately 1200 pregnant women will be approached from two Danish hospitals in Region Zealand during their nuchal fold scan and subsequently screened for periodontitis. The intervention group includes 300 pregnant women, who will be offered state-of-the-art periodontal treatment during pregnancy. The control group includes an additional 300 pregnant women, who will be offered periodontal treatment after giving birth. Outcome measures include periodontal measures and inflammatory, hormonal and glycaemic markers, that will be collected from all screened women and further during pregnancy week 20 and pregnancy week 35 for women enrolled in the intervention. The prevalence of preterm birth risk, low birth weight and risk markers of gestational diabetes mellitus (GDM) and preeclampsia will be collected from medical journals. Inflammatory markers include interleukin (IL)- 1β, IL-6, IL-10, IL-17α, high-sensitivity C-reactive protein (hs-CRP) and tumour necrosis factor (TNF)-α, hormones (insulin, leptin, growth differentiation factor (GDF)-15, adiponectin, resistin) and glycemic marker haemoglobin A1c (HbA1c) will be measured and analyzed. Saliva samples will be collected at baseline in gestational week 11-13 from all recruited participants and again at

gestational week 35-37 from the included women. Procedures are the same for all women in both the intervention and the control group.

ETHICS AND DISSEMINATION

Approval was granted by the regional ethical committee and reported to the Danish Data Protection Agency. The study will be conducted in accordance with the Helsinki Declaration and guidelines for Good Clinical Practice. PROBE is designed to provide evidence as to whether periodontal treatment during pregnancy can reduce the prevalence of preterm birth, low birth weight and risk of preeclampsia and gestational diabetes. Early prevention by treating periodontal disease during pregnancy is believed to have beneficial consequences for both the mother and child. The idea and ambition of the proposed PROBE project is to treat periodontal disease and the related systemic inflammation during pregnancy to reduce the risk of birth-related outcomes. Reducing the risk of these outcomes is expected to limit the risk of later development of metabolic disturbances during childhood. As our primary goal, we hope to start a debate on whether periodontal treatment during pregnancy should be offered for free as a natural part of antenatal care.

CLINICAL TRIALS REGISTRATION

The study was registered on clinicaltrials.gov (NCT06110143)

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Abstract OP008

Early introduction of ultra-processed foods (UPF) and low dietary diversity in children aged between 6 and 23 months

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Keywords: child, food intake, ultra-processed foods, public health surveillance.

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INTRODUCTION

In line with international recommendations for adequate complementary feeding at 6 months of age[1], the Dietary Guidelines for Brazilian Children Under 2 Years of Age suggest a diversified complementary feeding, based on natural or minimally processed foods, and not offering ultra-processed foods, as sweetened beverages, that is associated with an increase in body fat[2]. Besides, overweight, other forms of malnutrition such as wasting, stunting, underweight and micronutrient deficiencies can also be prevented with adequate complementary feeding from the earliest years of life[1,2]. The evaluation of food markers consumption and complementary feeding indicators is recommended to track unhealthy habits and to figure out the progress of complementary feeding in Brazil and around the world[3].

AIM

To describe ultra-processed food consumption and minimum dietary diversity in Brazilian children aged 6-23 months attending primary health care services.

METHODS

Cross-sectional study with secondary data from 189,706 children assisted by primary health care services in Brazil and registered in the Brazilian Food and Nutrition Surveillance System (SISVAN) in 2019. Data about food consumption were collected by the SISVAN's Form which evaluates the consumption of food markers on the day before the interview. Two complementary feeding indicators were calculated based on the Brazilian Ministry of Health method[3]: i) minimum dietary diversity (MDD): Percentage of children aged 6–23 months who consumed the six food groups [breast milk or dairy products; fruits, vegetables, and greens; orange-coloured vegetables/fruits or dark green leaves; meat/eggs; legumes; and cereals/tubers (rice, potatoes, yams, cassava, flour or noodles-not instant)], and ii) ultra-processed food consumption (UFC): Percentage of children aged 6–23 months who consumed at least one out of the four food groups [hamburgers/sausages (ham, mortadella, salami, sausage); sweetened beverages (soda, juice, powdered juice, coconut water, guarana syrup, fruit juice with added sugar); instant noodles, packaged snacks, or crackers; and stuffed cookies, sweets or candies (candies, lollipops, chewing gum, caramel, jelly)]. Prevalence and 95% confidence intervals were calculated for MDD and UFC according to the children's gender, age and macroregion of residence. The most food markers consumed were also calculated for each indicator.

Table 1. Prevalence and 95% confidence intervals (95%CI) of minimum dietary diversity and ultra-processed food consumption indicators of children aged 6–23 months (n= 189,706), according to gender, age and macro-region. Data from the Brazilian Food and Nutritional Surveillance System (SISVAN), 2019.

Minimum dietary diversity (MDD)	% (95%CI)
Total sample	45.8 (45.5; 46.0)
Gender	
Female	45.7 (45.4; 46.1)
Male	45.8 (45.4; 46.0)
Age	
6–11 months	37.9 (37.5; 38.3)
12–17 months	49.7 (49.3; 50.1)
18–23 months	50.3 (49.9; 50.7)
Brazilian macro-regions	
North	25.7 (25.0; 26.5)
Northeast	35.5 (35.1; 35.8)
Southeast	54.0 (53.7; 54.3)
South	48.4 (47.7; 49.2)
Centre-West	49.8 (48.4; 51.2)
Ultra-processed food consumption (UFC)	**% (95%CI)**
Total sample	50.6 (50.4; 50.8)
Gender	
Female	50.8 (50.5; 51.2)
Male	50.4 (50.0; 50.7)
Age	
6–11 months	33.0 (32.6; 33.3)
12–17 months	54.7 (54.3; 55.1)
18–23 months	65.1 (64.7; 65.5)
Brazilian macro-regions	
North	52.6 (51.7; 53.5)
Northeast	49.1 (48.7; 49.5)
Southeast	49.8 (49.5; 50.1)
South	55.8 (55.1; 56.5)
Centre-West	59.3 (57.9; 60.6)

RESULTS

The national database showed that less than 46% of the children with 6–23 months reached the MDD indicator in 2019. Lower frequencies of MDD were observed between children with 6–12 months and residents of the North (25.7%) and Northeast (35.5%) regions.

The proportion of continued breastfeeding for children All children (100%) that reached MDD consumed beans, rice and tubers, meat/eggs, and orange-coloured vegetables/fruit or dark green leaves in the previous day. with MDD was 50.9% (Table 1). The frequency of UFC was 50.6% and it was higher according to age (33.0% at 6–12 months and 65.1% at 18–23 months) and in the South (55.8%) and Centre-West (59.3%) regions compared to the other regions.

Sweetened beverages were the food marker with higher proportions (65.8%) among children with UFC (Figure 1).

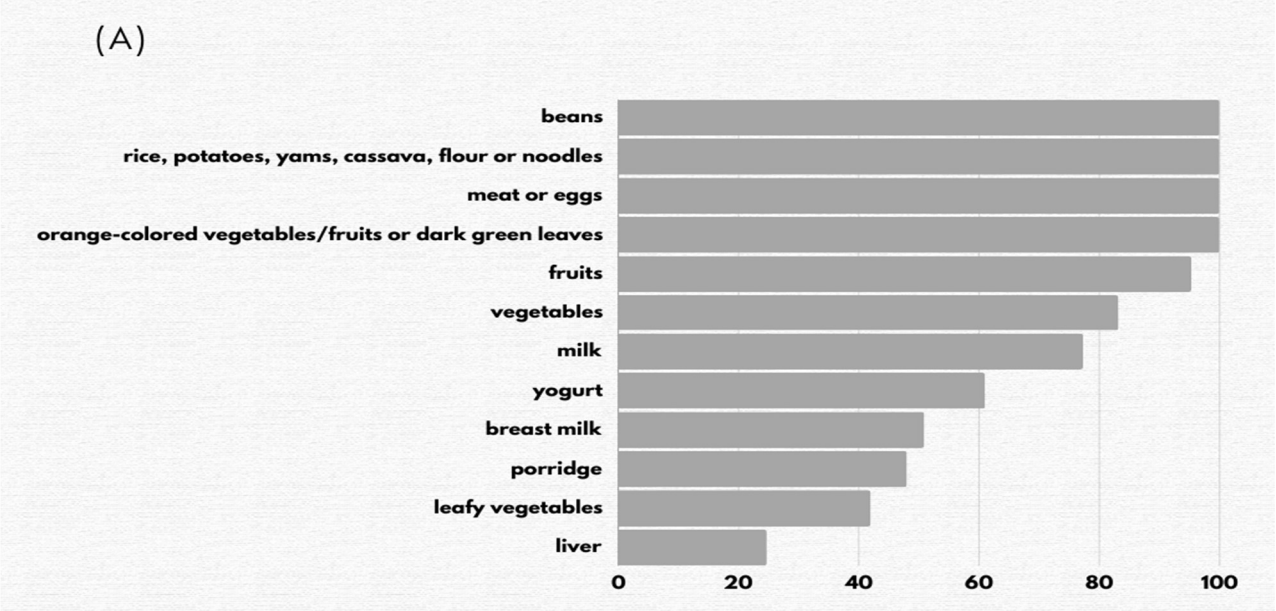

Figure 1. Food markers that contributed most to the minimum dietary diversity (a) and ultra-processed food consumption (b) indicators.

CONCLUSION

Despite the current recommendations for healthy complementary feeding practices, the results showed a worrying situation. Less than half of the children population had complementary feeding with basic and traditional foods. Most of the diet was poorly diversified. Except for beans, rice/potato, meats/eggs, and orange vegetables/green leaves, all the other food markers were not consumed the day before. Also, ultra-processed foods are being introduced precociously for children aged 6–23 months. Besides, only 50% of children that achieved MDD were breastfed while sweetened beverages were the ultra-processed food most introduced. Government intervention is necessary to guarantee access to healthy food and information for caregivers to promote the human right to adequate food.

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Abstract OP009

Agroecology and Nutrition

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INTRODUCTION

This session is aimed at identifying links between the fields of Agroecology and Nutrition in the context of challenges and opportunities for Sustainable Health and Nutrition. Understanding how we are (or not) "nourishing the planet and ourselves" is a priority debate of this century. Agriculture and food are artificialized daily, leading us to a climatic, civilizational, and sanitary collapse. However, glimpsing the path "from farm to fork" puts us before a dangerous shortcut since it omits important stretches of a long and tortuous road.

The design of food systems is essential to identify and establish links between Agroecology and Nutrition. Compared to two decades ago, when it was common and acceptable that dietary advice would focus only on food composition and related foods, we are facing a relevant turning point. Firstly, we are reminded that foods encompass not only nutrients but also their cultural and symbolic significance (CONTRERAS; GARCIA, 2011). Therefore, what we eat connects us to who we are, to our origins, identities, and ways of living. The paradigms of "*nutritionism*" – that is, nutritional reductionism – that have guided knowledge development in the field of nutrition (SCRINIS, 2021) are impregnated with conflicts of interest that are camouflaged by the alleged scientific neutrality. Ten years after the publication of the Dietary Guidelines for the Brazilian Population, we must reaffirm its first principle: "Diet is more than intake of nutrients" (BRASIL, 2014).

Secondly, it should be noted that what will reach the plates is the object of decision (or omission) of human beings. Deciding on whether we, as humanity, will have the right to full and equitable access to adequate and healthy food is part of political decisions. Thus, it is necessary to examine Food and Nutrition as a political field that requires the State to act on strategic issues (such as Food and Nutrition Security, human rights, and Agroecology, among others) and that also has differentiated and unequal opportunities to make choices in daily activities. As Portilho et al. (2011) state: "In addition to practices related to the satisfaction of nutritional needs, shaped by culture and essential for human life and survival, 'eating' also becomes a political and ideological act."

Thus, farms are very small parts of a global food system composed of diverse actors and processes, with decision-making capacity closely related to the amount of political and economic power they have. We are dealing with production, transportation, distribution, and storage as well as trade, losses, and waste of food. In this context, decisions about how much poison and ultra-processed foods are on our plates are often made far from our homes.

American biologist Raquel Carson wrote the book *Silent Spring* in the 1960s. Faced with the rapid transformations of the world, she found the impacts of the significant increase in human power to change nature and the environment, the most alarming developments being the contamination of air, soil, rivers, and seas. She tried to identify the risks of the use of pesticides, called by the author as a "man's war against nature" (CARSON, 2010; p.23). At that moment, in the face of the rise of the so-called Green Revolution, she anticipated the challenges of the future of healthy eating in the Anthropocene and marked the beginning of what today constitutes agroecological knowledge and practices.

From Carson's (2010) farms to Michael Pollan's farms – treated in his book *The Omnivore's Dilemma* – humanity's challenges have only increased. Pollan (2007) describes farms in the North American corn production belt as "food deserts", which have basically inedible crops, that is, they are intended to be processed or to feed animals. What is produced "can no longer feed the farmer's family" (p.43), as in the past. In January 2024, Brazil celebrated a record of agri-food exports, with special attention to soybeans and sugar. These data are relevant to remember that our farms also do not produce food, they produce commodities.

Let us return to the possible links and paths. In 2012, Brazil approved the National Policy on Agroecology and Organic Production (PNAPO) whose objective is to "integrate, articulate and adapt policies, programs, and actions that induce the agroecological transition and organic and agroecological-based production, contributing to the sustainable development and quality of life of the population, through the sustainable use of natural resources and the supply and consumption of healthy foods" (BRASIL, 2012). The approval process was closely articulated with the pressure of social movements in the agroecological field and Food and Nutrition Sovereignty and Security. At that time, a relevant connection between Agroecology and Nutrition was recognized from the

perspective of the Human Right to Adequate Food, understood as a field of knowledge, practices, and political action. It is fair and necessary to guide again their agricultural systems to agroecological production recognized as highly productive, sustainable, and a guarantee to the progressive realization of the Human Right to Adequate Food (DE SCHUTTER, 2012). Since 2023, programs, public policies, and plans related to Food and Nutrition Security and Agroecology have been resumed with the potential to impact the current and future contexts.

In the context of the Obesity, Malnutrition, and Climate Change Syndemic and the need for fairer, healthier, and more equitable food systems, we are challenged to take concrete actions that are more carefully thought out for human beings and nature. We have important links to be built between Agroecology and Nutrition in the face of the current paradoxes created by the global food system. More collaborative spaces and transdisciplinary construction of knowledge are needed to broaden the understanding of the challenges and strategies to face this complex crisis of crises. It is possible, it is necessary, and spaces like this roundtable contribute to this path.

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Abstract OP010

The Challenges of Front-of-package Labelling in Brazil

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INTRODUCTION

Brazil has been at the forefront of adopting a nutritional labelling model for foods, pioneering its implementation globally in the 1990s. Since the early 2000s, packaged foods have been required to provide comprehensive data on nutritional composition and ingredient lists. However, in 2014, the Brazilian Health Regulatory Agency (ANVISA) initiated a review process of the labelling regulations due to consumer challenges in effectively utilizing the existing labelling system. The review conducted by ANVISA identified several key difficulties faced by consumers, including low levels of consumer education and nutritional knowledge, confusion regarding the nutritional quality of foods under the national labelling model, inadequacy of the current model to meet consumer needs, concerns about the accuracy of declared information, and a lack of nutritional information on many food products.

By the beginning of the 2010s, some countries had already introduced alternative models of front-of-pack food labelling, such as Australia's five-star model in 2014, Ecuador's traffic light system in 2013, and Chile's octagonal warning labels in 2016. Between 2014 and 2018, ANVISA spearheaded a working group to reassess the Brazilian labelling model. This group examined various aspects including the nutritional table's list of nutrients, portion sizes, values per 100g, ingredient lists, frontal labelling, nutrients to be displayed, and thresholds to classify products as "high in" certain nutrients. In 2020, ANVISA published the new Brazilian nutritional labelling model (RDC 429/2020). The implementation schedule mandated that new products should adhere to the new model within 24 months of standard approval while existing products were given 36 to 60 months for compliance depending on various factors such as packaging type and producer size. The upgraded standard incorporated additional information such as total and added sugar content, nutritional details per 100g and by portion, percentage of daily value per portion, number of servings per package, portion size in grams, and homemade measurements. The front-of-package warning labels were approved for three key ingredients: added sugar, saturated fat, and sodium, with specific cutoff points to classify products as "high in" these components for both solid and liquid foods, respectively: added sugar 15g/100g and 7.5g/100ml, saturated fat 6/100g and 3g/100ml and sodium 600mg/100g and 300mg/100ml.

The new Brazilian labelling model represents significant progress, introducing front-pack warnings, a description of the added sugar content, and providing information per 100g to enhance data clarity. However, challenges remain, including the need to expand frontal alerts to include sweeteners, high-calorie content, and total fat. Additionally, there is scope to revise cutoff points for classifying products as "high in" and consider adopting the model proposed by the Pan American Health Organization to cover a wider range of products. Moreover, there's a need to reevaluate the implementation timeline, which currently appears overly lengthy. Furthermore, investments in research are crucial to assess consumer reception and effectiveness while incorporating new labelling elements into food and nutritional education initiatives. Above all, it's imperative to disseminate the guiding principle of the Brazilian Food Guide: "Avoid ultra-processed foods" among the population.

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Abstract OP011

Digital marketing of breast milk substitutes: regulation is needed!

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Keywords: Breastfeeding; Marketing; Regulation; Infant formula.

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INTRODUCTION

Babies in the first two years of life are vulnerable and can die from diarrhoea or pneumonia when fed improperly. Breastfeeding is a cultural practice that protects babies' and mothers' health. The International Code of Marketing of Breast Milk Substitutes was adopted by the World Health Assembly in 1981 to defend this practice. Brazil has adopted this Code, and the "Norma Brasileira de Comercialização de Alimentos para Lactentes e Crianças de Primeira Infância, Mamadeiras, Bicos e Chupetas" became a Law in 2006. It regulates the marketing of infant formulas, baby bottles, teats, pacifiers, milk, and processed complementary food by multinational corporations and retail stores. However digital environments are becoming the major source of exposure to promotion of breastmilk substitutes globally (Figure 1). Digital marketing practices evolve constantly and amplify the reach and power of advertising. Exposure to digital marketing increases the purchase of breast milk substitutes. Infant formula sales have increased to about US$55 billion annually, and less than half of babies globally are breastfed in accordance with WHO's recommendations: exclusive breastfeeding during the first six months of life, and breastfeeding complemented by family food until two years or more. Regulation of digital marketing of breast-milk substitutes is urgent and must cover a large range of situations, such as data management and search engine platforms, content creators, influencers, internet service providers, agency holding companies, social media platform providers, online retailers, streaming services, app owners and gaming service providers. Regulatory measures should establish a range of sanctions, such as fines, restrictions on licensing and product recalls, to deter the misleading digital marketing of infant and young child feeding products aimed at pregnant women, parents, young children, and health workers. To conquer the regulation of digital marketing of breastmilk substitutes, civil society organizations need to face the lobby of the baby food industry, acting jointly, to strengthen their fight.

Figure 1. Example of Digital Marketing

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Abstract OP012

Food Environments: Popularizing the Concept through Active Methodologies

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Keywords: food environments; sustainable food systems; active methodologies; education; capacity building.

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INTRODUCTION

Ensuring Food and Nutritional Security requires sustainable food systems. However, certain geographical territories hinder access to healthy foods. These food environments contribute to the development of non-communicable chronic diseases. Thus, it is necessary to observe the types and locations of food outlets, as well as accessibility and sales methods. The food supply chains, food environments, and consumer behaviour are fundamental elements for assessing sustainable food systems. Regarding the food environment, it refers to the physical space where consumers access food (GLANZ et al, 2005; HPLE, 2017).

To achieve Food and Nutritional Security while prioritizing food and environmental sustainability, healthcare professionals must grasp the complex nature of food selection processes. Moreover, they need to recognize the significant influence wielded by three key stakeholders in this realm: civil society, governments, and large corporations (SALLES-COSTA et al, 2022). Therefore, it is crucial for students to have a comprehensive understanding of the concept and classification of food environments.

Digital technologies have a significant impact on the organization of our society. The constant stimulus to perform different tasks within the same timeframe promotes the normalization of alternating or divided attention, which hinders the learning process and performance of activities. (RAMOS & VIEIRA, 2020). Based on this, the following guiding question was formulated: would it be possible to use digital technologies to improve attention and knowledge construction?

AIM

The aim of this study was to describe an educational activity on the concept of food environments for nutrition undergraduates.

METHODS

This is a descriptive study of the experience report type on an educational activity using active methodologies about food environments. Video conferences were held for planning meetings between students and the professor. A literature review was conducted to select the classification of food environments to be used in the activity. Potential issues were identified, learning objectives were developed to minimize them, and based on these objectives, the most suitable methodologies were chosen.

The educational action took place during a nutrition event at a university in Macaé, Rio de Janeiro, in June 2023. Microlearning techniques were used with interactive digital tools and group dynamics. The resources used included: a projector, table, and the NOVA food groups (unprocessed and minimally processed, processed, and ultra-processed foods).

RESULTS

The classification of food environments used was: (1) Food oases: limited access to unhealthy foods to promote a healthy lifestyle; (2) Food deserts: socially vulnerable environments that lack or have limited physical access to healthy foods (unprocessed or minimally processed); (3) Food swamps: environments that where physical access is facilitated for unhealthy foods (processed and ultra-processed).

From the challenges encountered in planning the educational activity, the short duration for the dynamic and the physical arrangement in the auditorium format could interfere with the engagement of all participants. Therefore, the learning objectives as well as the active tools and methodologies used are shown in Figure 1.

Following an introduction to obesogenic environments by a student at the event, the action unfolded in three stages: (1) 70 students answered a question about types of food environments through an online interactive platform. (2) Three geographically distant locations were represented, each one having foods with different NOVA food groups. Three volunteers per shift were selected to simulate the purchase of four foods available in their region, aiming for a complete and balanced meal. (3) During interaction with the audience, information regarding which food environment each volunteer was in (oasis, swamp, desert) was revealed and how it influenced their food choices. Most students showed no knowledge of the concept of food environment or ways to classify it.

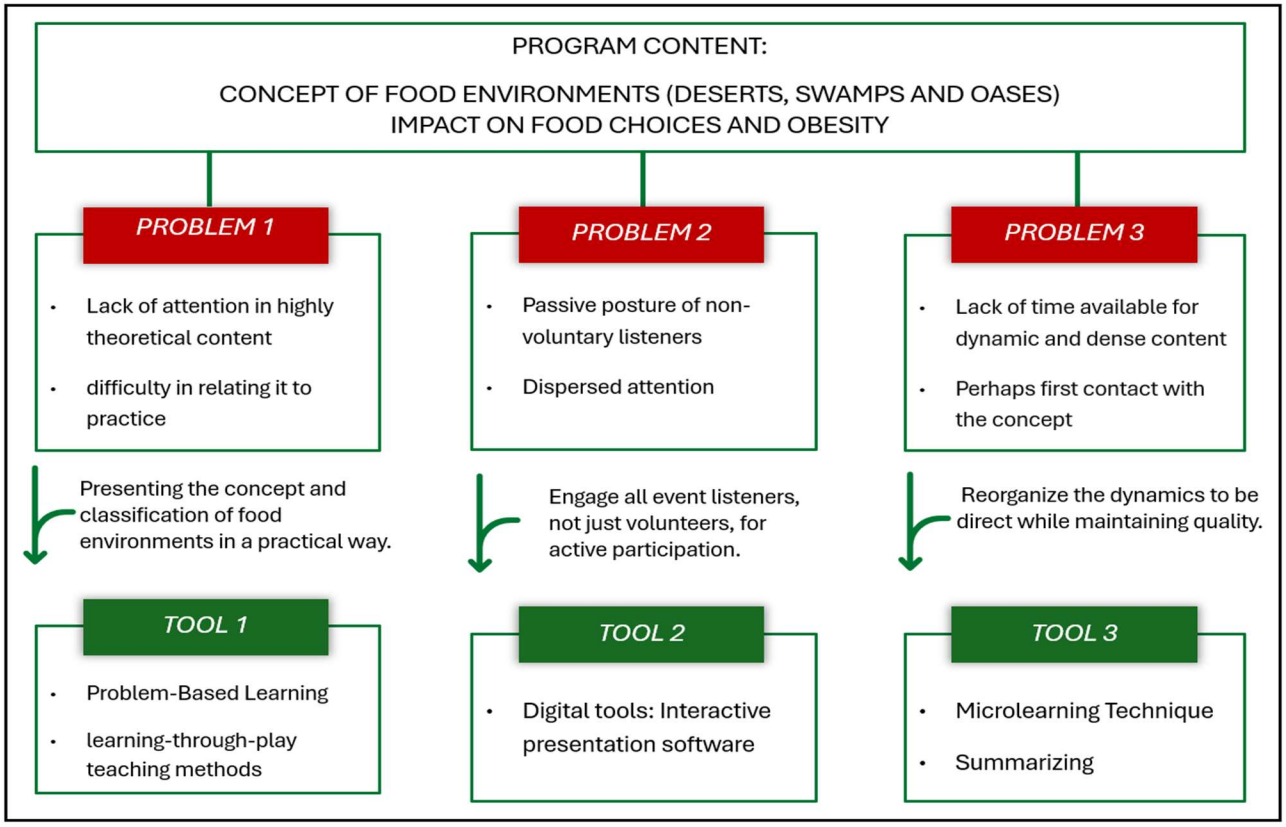

Figure 1. **Schematized map of the active methodologies' selection process.**
Source: authors' own elaboration

According to HPLE (2017), the food environment is related to physical, economic, political, and sociocultural contexts. In the dynamic described here, we simulated different physical spaces from a geographical perspective, but with the same purchasing power at that specific moment. Nevertheless, the possibilities offered by each environment determined the type of meal that could be composed.

Ramos and Vieira (2020), upon analyzing various studies on the topic, highlighted that digital technologies can be part of active methodologies, favouring greater involvement and motivation of learners, provided they are well employed. This corroborates with the experience reported here, as students actively participated, from the moment they became part of the knowledge construction process and completed summarizing on food environments.

Furthermore, Alias & Razak (2023) emphasize that microlearning contents, which are small, easily digestible pieces of information, contribute to the student applying knowledge in their daily lives. As the activity occurred in two moments, it was possible to carry out a formative assessment and readjust the instructional flow of the lesson so that the content could be better understood.

Conclusion: The action allowed students to become familiar with the concept of food environments and active methodologies. Digital tools engaged not only the volunteers but also all students. Therefore, the action contributed to educating nutrition students and raising awareness of their role as future educators in disease prevention through sustainable food environments.

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Abstract OP013

Exploring the Impact of the Green Child Intervention on Consumption of Non-Conventional Food Plants and Markers of Healthy Eating Habits in School Children

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Keywords: Malnutrition, biodiversity, ultra-processed food, non-conventional food plants, garden, sustainable and adolescents.

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INTRODUCTION

Currently, malnutrition, in all its forms, including undernutrition, overweight, obesity, and nutritional deficiencies coexist, and they are worsened by climate change. This synergy of pandemics, called the Global Syndemic, is a challenge for the future of the population and it is aggravated by the unsustainability of the actual food system. Low biodiversity, low access and poor food quality, high consumption of ultra-processed foods and Food Insecurity are some of the nutritional and health consequences. In Brazil, social and economic inequalities and the fragility of environmental policies worsen these conditions.

AIM

To describe the preliminary findings of the Green Child school-based Intervention to promote the intake of non-conventional food plants (NCFP) and *in natura* and minimally processed food, and to reduce the consumption of ultra-processed foods.

METHODS

This intervention study was conducted with 234 adolescents aged between 10 and 15 years old and from 6th and 7th grades in two public schools [intervention (IS) and control (CS) schools] in Rio de Janeiro city. The activities in IS were based on the PANC identification and creation of a mural with drawings produced by students; reading the garden chapter of the project book; gardening activities with NCFP cultivation; culinary workshop; and playing a game about the Food Guide for the Brazilian Population. Information about age, gender, weight (kg), stature (cm), vulnerable communities (residence yes or not), skin color, participation in the national Bolsa Família cash transfer program – (BFP), guardian's job, maternal parity and the number of home dwellers were collected for both IS and CS. We assessed dietary habits by collecting data on the consumption of both healthy (HFM: beans, fruits, legumes and vegetables) and unhealthy (UFM: sugar-sweetened beverages, sausages/hamburgers, chips/ instant noodles, candies and cookies) food markers on the day before the interview. The participants were also queried about their prior consumption of non-conventional food products (NCFP), including identification of specific items consumed. Chi-square (or Fisher's exact test) and t-tests were conducted to evaluate disparities in NCFP, traditional food, and ultra-processed food consumption, as well as sociodemographic characteristics, both before and after the intervention.

RESULTS

Except by having residence in vulnerable communities (78.5 vs 90.4; p=0.014), all other anthropometric and socio-demographic characteristics were equally distributed between intervention and control schools at baseline (Table 1).

It was found that the frequency of knowing UCFP was higher at the IS than CS (23.1 vs 12.5; 0.038) at baseline and post-intervention (68.2 vs 18.5; p<0.01). It was not observed any difference in the prevalence of HFM and UFM at baseline (P>0.05) and at post-intervention (P>0.05) between schools (Table 2).

The study revealed a higher prevalence of awareness regarding UCFP at the intervention school (IS) compared to the control school (CS) both at baseline (23.1% vs. 12.5%; p = 0.038) and post-intervention (68.2% vs. 18.5%; p < 0.01). No significant differences were observed in the prevalence of HFM and UFM between schools, neither at baseline (p > 0.05) nor at post-intervention (p > 0.05), as indicated in Table 2.

The subsequent findings revealed a significant enhancement in both awareness of NCFP (23.1% to 68.2%; p < 0.001) and their consumption (13.1% to 39.8%; p < 0.001) from baseline to post-intervention at IS (Table 3).

Table 1. Anthropometric and socio-demographic characteristics at baseline (T0) according to a school-based intervention study.

Variables	**Public School**		
	T0		
	Intervention (N=130)	Control (N=104)	
	Mean (SD)		p-value*
Age (*years*)	12.2 (1.00)	12.0 (0.09)	0.214
Weight *(kg)*	50.2 (1.09)	48.3 (1.17)	0.248
Stature *(cm)*	155.8 (0.75)	154.1 (0.77)	0.108
Maternal parity *(n)*	2.56 (0.11)	2.57 (0.12)	0.681
Home dwellers *(n)*	3.97 (0.13)	3.95 (0.16)	0.932
	N (%)		p-value**
Gender			0.106
Female	65 (50.0)	63 (60.6)	
Male	65 (50,0)	41 (39.4)	
Skin color			0.572***
Black or brown	81 (62.3)	59 (56.7)	
White	46 (35.4)	41 (39.4)	
Other	03 (02.3)	04 (03.9)	
Guardian's job			0.618
Yes	83 (64.5)	66 (64.7)	
Not	40 (35.5)	36 (35.3)	
BFP‡			0.083
Yes	42 (33.1)	45 (44.1)	
Not	62 (48.8)	35 (34.3)	
Do not know	23 (18.1)	22 (21.6)	
Vulnerable community			**0.014**
Yes	102 (78.5)	94 (90.4)	
Not	28 (21.5)	10 (9.6)	

Student. **Chi-square. * Fisher.‡Bolsa Familia Program cash transfer.*

Table 2. Non-conventional food plants (NCFP), healthy (HFM) and unhealthy (UFM) food markers according to school-based intervention study at baseline (T0) and post-intervention (T1).

Variables	**Public School**					
	T0		*p-value**	**T1**		*p-value**
	Intervention‡	Control‡‡		Intervention	Control	
NCFP†(know about)			0.038			<0.001
Yes	23.1	12.5		68.2	18.5	
Not	76.9	87.5		31.8	81.5	
HFM††(yes)						
Bean	83.8	86.4	0.587	71.3	76.7	0.355
Fruits	53.1	55.8	0.681	49.6	50.5	0.895
Legumes/ Vegetables	46.1	42.7	0.544	44.5	43.1	0.677
UFM††(yes)						
Hamburger/ sausage	32.6	37.3	0.456	36.4	42.7	0.411
Sweetened beverages	69.2	75.0	0.330	76.0	78.6	0.630
Chips/ instant noodles	32.3	32.7	0.950	31.8	35.9	0.399
Candies/ cookies	55.4	52.9	0.590	51.2	56.3	0.435

*‡Intervention school (IS). ‡‡Control school (CS). *Chi-square.*
†Non-conventional food plants. ††Consumption on the previous day

Table 3. Non-conventional food plants (NCFP) consumption and healthy (HFM) and unhealthy (UFM) food markers from baseline (T0) to post-intervention wave of follow-up at intervention school.

Variables	Intervention School		
	T0	T1	p-value*
NCFP‡ (know about)			
Yes	23.1	68.2	**<0.001**
Not	76.9	31.8	
NCFP‡ (previous consumption)			
Yes	13.1	39.8	**<0.001**
Not	86.9	60.2	
HFM# (yes)			
Bean	83.9	71.3	**0.016**
Fruits	53.1	49.6	0.577
Legumes/ Vegetables	46.1	44.5	0.802
UFM# (yes)			
Hamburger/ sausage	32.6	36.4	0.350
Sugar-sweetened Beverages	69.2	76.0	0.224
Chips and instant noodles	32.3	31.8	0.928
Candies and cookies	55.4	51.2	0.496

**Chi-square. ‡Non-conventional food plants. #Consumption at day before.*

CONCLUSION

The intervention successfully enhanced both the awareness/ knowledge and dietary consumption of NCFP among students from public schools. However, there was no observed change in the consumption pattern of HFM and UFM during this period. Further research and long-term initiatives are imperative to evaluate and enhance sustainable food habits and nutrition among adolescents.

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Abstract OP014

School Garden as a Sustainable Strategy for Food and Nutrition Education

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INTRODUCTION

School gardens appear in several official Brazilian documents as a tool to address topics related to food and nutritional education, health promotion and healthier school environments, with students from all segments, from early childhood education to university education. Teaching gardens at school are a suitable space for transdisciplinary dialogues on agroecology, sustainable development, food sovereignty and the human right to adequate food, configuring themselves as a field of practical experiences within the school environment.

Nowadays, it is necessary to think about food spaces beyond material and physical constructions, but rather as spaces for dialogue and exchange, between people and food, in a dynamic, constantly changing way, as a meeting place. Reflection on healthy education in contemporary society demands the articulation of educational and media environments in an education proposal. The challenge of thinking about food issues not exclusively in a physical environment, but in an educational space crossed by the media in the daily educational process in the training of young people. Below we will present some activities developed with vegetable gardens in schools.

The experience built since 2016 of the school garden project at CEFET-RJ (Federal Technology Center Celso Suchow da Fonseca) *Campus* Maria da Graça, where we present the garden as a driving force behind decolonial pedagogical practices, integrating the teaching of botany, ecology, technologies and food and nutritional education. We operate within the scope of teaching, research and extension, in order to contribute positively to the quality of science education. The Horta Escolar project aims to be a space for discovery and learning through student contact with vegetables, during the process of planting, caring, pruning, harvesting and consuming these foodstuffs (Figure 1), working with technological education and sustainability. The garden functions as a "living laboratory" and aims to be an open green space for learning, which crosses the entire curriculum in an interdisciplinary way, covering different curricular contents. When interacting with the garden, the student begins to reflect on the food production process, its origin, food culture and respect for the food environment. The garden makes it possible to treat social relationships mediated by food and places in their complexity in an integrated way.

During the period of social isolation due to the COVID-19 pandemic, it was necessary to virtualize our activities, as we did not have access to our planted space. At this moment, we expanded our experience with the mediatized vegetable garden, through the creation and maintenance of the @hortacefet profile (Figure 2), which aims to promote scientific dissemination and the popularization of science through our posts. The virtualization of school garden work has streamlined our actions and increased the number of people reached by the project. The social media of the Horta Escolar project are important tools for disseminating knowledge and connecting with the participating public.

Based on this successful experience of support, together with LADIGE/UFRJ (Digital Food Education and humanities laboratory/Federal University of Rio de Janeiro), we have created four other vegetable gardens in public schools of the state of Rio de Janeiro, through a research project financed by FAPERJ (Carlos Amparo Filho Foundation to support research in the state of Rio de Janeiro). Through action research, we collectively build these green spaces, meeting local demands. With new technologies and new sensibilities, both for technical training and for social awareness, we share a meeting space of meanings and knowledge as healthy life alternatives. School gardens showed potential for humanization and socialization. The dynamization of ideas and content went through all stages of planning and implementation. The gardens were built in a physical and mediatized way, in a unified way and operated through the link that united them, because although communication processes are accelerated today, the ancestral condition of balance between man and his food remains. As consequences of these experiences and facilitating effects, we can mention the recognition of unconventional plants, activities outside the classroom in recognition of the constructed green space, partnership with school agents, technicians, teachers and providers of kitchen service, themed interdisciplinary training for teachers, posting cultivable plants on social media and editing memes with themed content.

The pedagogical power of green meeting space for food and nutrition education at school became clear through the gardens built and the experiences shared by the agents involved in this work.

Figure 1. Food and nutritional education workshop held at CEFET-RJ

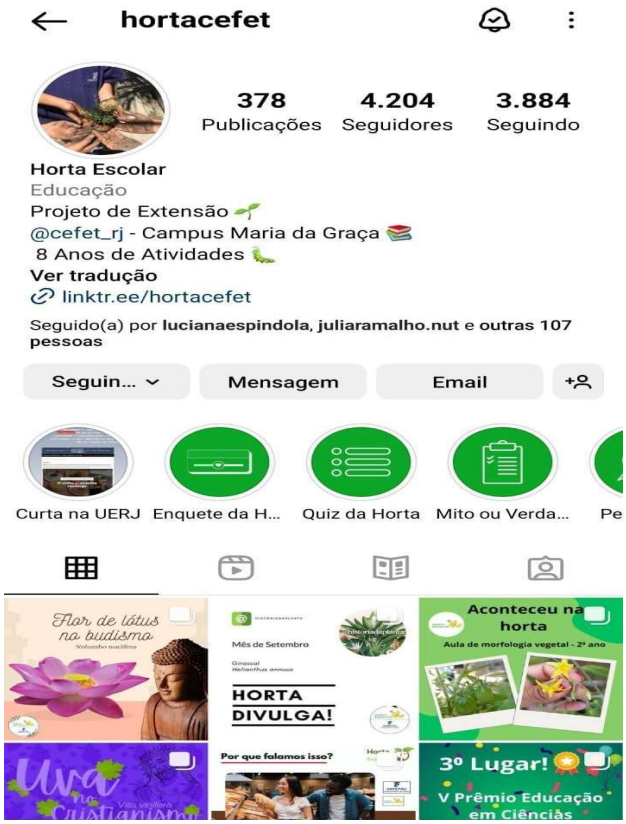

Figure 2. Screenshot of @hortacefet profile

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Abstract OP015

Food, ancestry and preservation of culinary memory: A hoop and a link!

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Keywords: culture; ancestry; memory; food; originating peoples.

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INTRODUCTION

Food serves as both a means of production and a revealing mirror of a people's traditions. With each pinch of seasoning, another layer of cultural reflection is added. Articulating the relationship between nutritional education and the food culture of indigenous communities is paramount to preserving the rich legacy that ancestral foods carry. From the profound respect for the soil to the emotions that bridge generations through shared flavors, food embodies a profound cultural continuity. Non-Conventional Food Plants (NCFP) and cocoa stand as poignant symbols of American ancestry, representing a heritage deeply rooted in the land. Cocoa, in particular, holds a special significance as one of the earliest export foods from the Americas to Europe, remaining a staple in the daily lives of indigenous peoples across the continent.

AIM

To address ancestry in food culture, maintain memory and enable culinary autonomy in schools.

METHODS

The facilitator used an adapted culinary workshop which included preparations to taste dishes based on NCFP and cocoa. The NCFP dishes included taioba (*Xanthosoma sagittifolium*) cake; malvavisco flowers (*Malvaviscus arboreus* Cav.) juice; cassava paste with wild coriander (*Erygium campestre*) and horseweed (*Conyza spp.*) and organic chocolate with cocoa (*Theobroma cacao*). NCFPs were selected based on their seasonal availability, nutritional composition, flavor, and color, with the intention of exploring alternative uses for natural dyes in culinary applications. Common flowers, fruits, and leaves were incorporated into cooking recipes to highlight plants readily accessible to everyone. This approach not only showcased the edibility of flowers but also opened discussions about the risks associated with ultra-processed foods and industrially produced chocolates. Consequently, the preparations were crafted as wholesome and sustainable alternatives to the small meals typically comprised of ultra-processed foods.

PRELIMINARY RESULTS

Bring people closer to sustainable food and bring cultural recovery to an empirical experience.

CONCLUSION

By recognizing and valuing the foods that have been part of the diet of indigenous people for centuries, we are not only rescuing an essential part of our identity but also promoting sustainability and respect for the environment. Valuing real food not only diversifies our diet but also contributes to the preservation of biodiversity and food and nutritional sovereignty and security.

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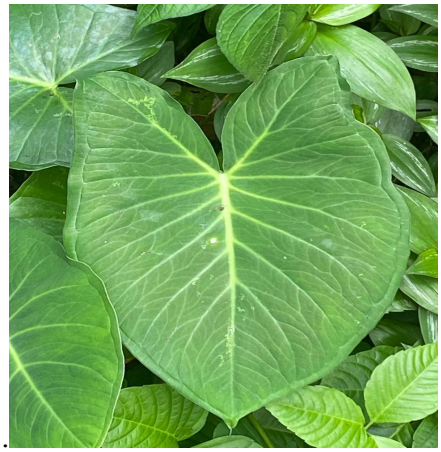
1. 
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Figures: 1) Taioba plant; 2) Malvavisco plant; 3) Taioba cake; 4) Unconventional food plants: Chaya (*Cnidoscolus aconitifolius*); 5) beldroega (*Talinum triangulare*); 6) Students during the culinary workshop; 7) Nicolau preparing the chocolate; 8) Group during the culinary workshop at school.

WPHNA

Abstract OP016

Book Launch: Non-conventional Food Plants Garden, Culture and Food: Food and Nutritional Sovereignty and Security

Maria Beatriz Trindade de Castro, Marla Ibrahim Uehbe de Oliveira, Amanda Rodrigues Amorim Adegboye, Maria Cecília Trindade de Castro, Andreia Andrade-Silva, Maria Eliza de Mattos Tobler Mastrangelo, Rute Costa, Juliana de Oliveira Monteiro Prado Ferreira, Juliana de Oliveira Ramadas Rodrigues, Fernanda Bispo dos Santos, Renata Sirimarco, Marta Maria Antonieta de Souza Santos, Marianna Almeida Cunha de Azeredo Santos, Hellen Cristine de Souza Ataliba, Giovana Nigri Cursino.

Illustration by Hannah Cunha e Dalila Santos.
Designers: Pedro Henrique Pires Melo e Nair de Paula Soares.
Editor: Maycon Dias Prado
Photos: Vanessa Ataliba, Fabiane Bernardo de Almeida.
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Original book title in Portuguese: Horta PANC, Cultura & Comida: Soberania e Segurança Alimentar e Nutricional ISBN: 978-65-00-59299-3

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The book, derived from the multidisciplinary initiative "Green Child is Cool" by the Josué de Castro Nutrition Institute at the Federal University of Rio de Janeiro (UFRJ), aims to promote food and nutrition security among children and adolescents about the importance of sustainable nutrition through interactive activities. It involves mapping the environment around schools, promoting the use of non-conventional food plants in daily meals, and discussing topics such as waste management and urban gardening.

It highlights the importance of sustainable food systems in preserving biodiversity, promoting health, and ensuring nutrition for the population. The book's purpose is to encourage the cultivation of non-conventional food plants in community gardens and provide recipes for their preparation.

Emphasising the concept of Food and Nutritional Sovereignty and Security (SSAN), the book advocates for the utilization of non-conventional food plants to address nutritional challenges and promote sustainable food practices. It stresses the need to involve children and the general population in environmental issues, particularly in achieving sustainable nutrition. The text also discusses the role of traditional communities in preserving biodiversity and sustainable food practices.

The book also addresses the significance of nutrition in child development and disease prevention, advocating for the right to adequate nutrition and condemning hunger as a crime. It emphasizes the nutritional benefits of non-conventional food plants and their role in promoting sustainable, healthy, and accessible food options.

Furthermore, the text discusses strategies for promoting Food and Nutritional Sovereignty and Security (SSAN) and fulfilling the Human Right to Adequate Food (DHAA). It critiques recent setbacks in food security policies and calls for progressive public policies to address social and environmental changes.

Additionally, the book provides guidance on establishing different types of gardens and offers recipes using PANC. It encourages readers to engage in mapping non-conventional food plants in their surroundings and share their recipes, promoting hands-on learning and community engagement in sustainable food practices. The hard and soft copies of the book have been distributed free of charge in public schools in Rio de Janeiro

BIOGRAPHY OF THE PRESENTING AUTHOR

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1]  2]  3] 

Photo 1: The project team with Professor Roberta; Photo 2: guides young people to identify, cultivate, and prepare homemade recipes with Panc; Photo 3: during the SIAC at UFRJ.

Abstract OP017

Community Actions and a Glance at Urban Food Systems: from farm to fork

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Keywords: Community Action, Nutrition, Food, Older adults, Public Health Nutrition.

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INTRODUCTION

Brazil's older adult population is experiencing a significant and rapid demographic shift. This growth is accompanied by a complex interplay of social and economic factors that exacerbate health disparities and inequalities. Unequal access to resources throughout life leads to social inequality, leaving many older adults economically vulnerable. In urban environments, fear of violence restricts mobility and social interaction, negatively impacting both physical and mental health. Furthermore, social isolation, often linked to these challenges, further increases health risks among older adults. These factors converge to create a critical situation: stark nutritional and health inequalities that disproportionately burden this growing demographic.

The urgency to address these challenges is underscored by recent government reports highlighting the need for robust public health initiatives focused on food and nutrition programs for older adults (Brazil, 2022). The COVID-19 pandemic further exposed the vulnerabilities of this population, disproportionately impacting their health. This global health crisis served as a stark illustration of the complex interplay between human biology (increased susceptibility to disease with age), social conditions (poverty, discrimination, and lack of social support worsening health outcomes), and the effectiveness of public health infrastructure (critical for mitigating infectious disease spread). This confluence of factors creates a vicious cycle where social and economic disadvantages translate into poorer health, further increasing vulnerability to future health threats (WHO, 2023; Rede PESAN, 2022).

Research underscores the multifaceted nature of these challenges, operating at both the individual and societal levels (Popkin, 2017). Effectively addressing these issues necessitates a multidisciplinary approach that leverages expertise from various fields, including nutrition, public health, social work, and even urban planning.

In this context, an examination of the historical evolution of the food system reveals the current critical situation, and to ensure the sustainability of the food system, recommended actions must address economic and structural costs, political economy, cultural diversity, equity and social justice, and governance and decision-support tools for transforming the food system (Bené et al., 2020). Therefore, interventions for older adults must take even greater account due to their specific characteristics and vulnerabilities (Brazil, 2022). Therefore, to address the complex interactions that affect the human right to adequate and healthy food in the face of environmental conditions and food systems, and to promote healthy ageing in the context of urban food systems, the Food, Nutrition and Ageing Extension Project (PROANE) develop food and nutrition assessment and education activities with older people to promote health and ensure adequate and healthy nutrition for older adults discussing the urban food system.

OBJECTIVE

To present PROANE's community actions with older adults on the promotion of adequate and healthy food in urban food systems.

METHODS

The community actions involve individuals aged 60 years and over who are members of the Community Action Centre of UERJ's Human Ageing Centre (NEH-UERJ) and who are assisted in a Primary Healthcare Centre in the community of (slum) Formiga in the city of Rio de Janeiro. This report presents community actions based on the principles of popular health education and health promotion developed between 2020 and 2023 (Menezes et al., 2020; LIS EAN ASPREDES, 2022). The PROANE project follows a participatory research approach in line with actions that include active listening, welcoming demands, clarifying doubts, respect for different types of knowledge, and searching for solutions to everyday challenges. This

includes closed group meetings which were conducted face-to-face or remotely using digital tools such as WhatsApp, Zoom, and the group's YouTube channel. These meetings took place weekly, both synchronously and asynchronously. The activities were designed to be playful, integrative, and participatory, and aimed to encourage participants to become more autonomous in resolving everyday issues related to the challenges of adopting a healthy and adequate diet as they age in the context of the urban food system (Menezes et al., 2020; FAO, 2023). Food, eating, commensality and cookery permeated the discussion about the food system from farm to fork.

RESULTS

From March 2020 to September 2021, PROANE had to adapt to the Covid-19 pandemic by moving to a fully digital format. This posed numerous challenges to maintain the theoretical assumptions of dialogue, respect for different types of knowledge, problematisation of everyday life and a focus on food and cooking (Menezes et al., 2020; Brazil, 2022). Contact with the participants from 2018 to 2021 was maintained through WhatsApp groups, and the project's Instagram and Facebook (@proaneuerj) were used to facilitate the exchange of information and foster a community sense. Education activities were conducted remotely through weekly virtual meetings on Zoom and WhatsApp messages. Topics covered from September 2020 included food, nutrition, and ageing; food marketing; oils and fats; spices; sugars and sweeteners; practical kitchen; and food systems - shopping and storage in the pandemic scenario. The pedagogical strategies used included challenges, scavenger hunts and remote celebrations, and the team had to demonstrate creativity and technical mastery in providing health and nutrition care through digital food and nutrition education activities. This innovative experience not only supported the professional qualification but also promoted a sense of welcome, belonging and digital inclusion for older people.

Face-to-face activities resumed in April 2022. However, synchronous, and asynchronous remote actions were also maintained at participants' request, and a YouTube channel was created to document the face-to-face activities. From June of the same year, face-to-face activities were also developed with older people from the Formiga´s community in the city of Rio de Janeiro. Participants were actively involved in planning the activities, maintaining existing initiatives and introducing new ones. Technological advancements and educational materials were developed to address the relationship between food, nutrition, and healthy ageing. During this period, the team increased its efforts in digital support for older people, including accessible materials and personal support. The tour of the food system included technical and social visits to retail and wholesale outlets, food production and consumption, and meal tasting. Educational materials were produced to promote information and map the places where agroecological food systems could be found.

In 2023, all the actions returned entirely to a face-to-face format. This resulted in the organisation of various events, enhancing the visits and practical actions in the discussion of food from farm to fork (Figure 1).

CONCLUSION

The participants have become increasingly involved in PROANE's initiatives. Their leadership in organising the tour to the organic producers exemplify participants' protagonism. They also state that sharing knowledge contributes to strengthening self-esteem, self-care, and the formation of a critical and reflective attitude towards food. Changes observed include an attentive attitude towards the selection, preparation, and consumption of food in line with the struggle for a healthy and adequate food system. Food and cooking serve as the main expression, improving the space for social inclusion and sharing of knowledge and experience. Together, we develop innovative coping strategies based on real challenges. Digital media and lived experience have facilitated the expansion and transformation of communication and discussion around the urban food system, from farm to fork.

Figure 1. PROANE's actions farm to fork

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