

EGEA edition 10
International conference

EGEA CONFERENCE POSTERS' ABSTRACTS

OCTOBER 7-9, MONTPELLIER, FRANCE

CAN DIETARY RECOMMENDATIONS FOR FRUIT AND VEGETABLE INTAKE BE MET WITHIN SUSTAINABLE FOOD SYSTEMS?

Co-chairs: **Boitshepo BIBI GIYOSE & Joël DORÉ**

Scientific Committee: **Ramya AMBIKAPATHI, Sylvie AVALLONE, Malek BATAL, Jean-Pierre CRAVEDI, Sophie DROGUE, Rémi KAHANE, Sophie NICKLAUS, Christian REYNOLDS, Mphumuzi SUKATI, Roberto UGAS**

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WEDNESDAY 7 OCTOBER

PROGRAMME

12:30 - 14:00 WELCOME (FREE LUNCH) – REGISTRATION – POSTER DISPLAY

14:00 - 14:30 OPENING SESSION

Christel Teyssèdre, *APRIFEL (FR)*
Joël Doré, *INRAE (FR)*
Bibi Giyose, *FAO (ZA)*

14:30 - 15:40 KEYNOTE LECTURES

Co-chairs: Boitshepo Giyose & Joël Doré

• From Evidence to Action: Building the Bridge Between EGEA 2023 and EGEA 2026
Boitshepo Giyose, *FAO (ZA)* & **Joël Doré**, *INRAE (FR)*

• Overview of food systems, their evolution over recent years, and the role of fruit and vegetables
Patrick Caron, *CIRAD (FR)*

• Current dietary recommendations: Global overview
Francesco Branca, *Université de Genève (IT)*

15:40 - 16:10 NETWORKING BREAK AND POSTER VISIT

16:10 - 18:20 SESSION 1 : The impacts of meeting fruit & vegetable recommendations

Co-chairs: Malek Batal & Ramya Ambikapathi

16:15 - 17:45 KEYNOTE LECTURES

• Relationship Between Plant-based Diets, Fruits & vegetables, and Health
Christine Feillet-Coudray, *INRAE (FR)*

• Cultivating response-ability at the margins: smallholder farmers as agents of climate mitigation and ecosystem repair
Stephen Sherwood, *EkoRural/Granja Urkuwayku/University of Wageningen (EC/NL)*

• How does promotion of fruit and vegetable intake in rural and urban consumers link to agroecology, agrobiodiversity conservation and resilience?
Céline Termote, *Alliance Biodiversity & CIAT (KE)*

• Equity, cultures, and food justice
Shakuntala Haraksingh Thilsted, *CGIAR (MY)*

• Risk-benefit analysis and evidence for change
Sara Monteiro Pires, *Institut national de l'alimentation DTU (DK)*

17:45 - 18:15 ORAL COMMUNICATIONS

• Dietary patterns based on the intake of plant or animal ultra-processed and non-ultra-processed food: associations with cardiovascular diseases risk from two different approaches in the NutriNet-Santé cohort
Benjamin Allès, *EREN (FR)*

• Can global dietary recommendations be met within sustainable food systems?
Charlotte Chemarin, *CGIAR (FR)*

• Fruit, vegetable and nut content of meals and its association with combined nutritional value and environmental impact score
Leona Lindberg, *Queen's University Belfast (UK)*

18:15 - 20:00 WELCOME COCKTAIL (FREE)



THURSDAY 8 OCTOBER

PROGRAMME

08:30 - 09:00 **WELCOME COFFEE**

09:00 - 11:10 SESSION 2 : Behaviors and levers for change

Co-chairs: Sophie Nicklaus & Roberto Ugas

09:05 - 10:35 KEYNOTE LECTURES

• Technology & Digital Tools to Guide Consumers Toward Better Food Choices: Pros & Cons of Social Media
Frans Folkvord, *Tilburg University (NL)*

• Social and cultural influences on food choices
Almudena Claassen, *Max Planck Institut (GE)*

• Using psychological insights to change behaviour: The BIG potential of making small changes
Gareth Hollands, *University College London (UK)*

• Overview of public policies for healthier and more sustainable diets: What lessons can be learned?
Céline Bonnet, *Toulouse School of Economics/INRAE (FR)*

• Fruit and vegetable consumption in Peru: Policy and real-world practices
Katherine Curi Quinto, *Instituto de Investigación Nutricional (PE)*

10:35 - 11:05 **NETWORKING BREAK AND POSTER VISIT**

11:05 - 11:35 ORAL COMMUNICATIONS

• Association of acculturation with diet quality, food consumption and weight status among migrant students from French Overseas regions after relocation to mainland France
Mélanie Antoine, *Université de Montpellier (FR)*

• Fruit in the Desert: Assessing Student Access and Consumption, and Barriers and Opportunities for Improvement in the University Environment
Temilade W Arulogun, *University of Ibadan (NG)*

• Promotion of opportunity vegetables in urban Ethiopia: Cost-effectiveness of face-to-face cooking demonstrations versus digital media messages to increase intake of pumpkin and okra
Ilana Cliffer, *World Vegetable Center (TH)*

11:45 - 12:15 **POSTER SESSION AWARD (PRESENTATION OF TOP 5 POSTERS - SOP1)**

12:15 - 13:45 **LUNCH BREAK AND POSTER VISIT**

13:45 -16:00 SESSION 3 : Collaborative multistakeholders projects aiming to support consumers in adopting healthier and more sustainable diets with increased fruit and vegetable intake

Co-chairs: Jean-Pierre Cravedi & Sophie Drogué

13:50 -15:20 KEYNOTE LECTURES

• PASSERELLE PLUS (2024-2025) – Exploring new approaches to address food insecurity in France: evaluation of a Cash-Plus programme combining unrestricted cash transfers, social work support, and a sustainable diet workshop
Marlène Pérignon, *INRAE (FR)*

• MARIGO – (2021-2024) Promotion of Agroecological Transition in Tropical Areas: The Challenges of Market Gardening in Côte d'Ivoire
Rahim Ouedraogo & Thibaud Martin, *CIRAD (SN/FR)*

• Co-FRESH (2020-2024 ; Europe) - Co-creating Sustainable and Competitive Fruit and Vegetable Value Chains in Europe
Inés Echeverría Goñi, *CNTA (ES)*

• MoreMedDiet (2023-2026 ; 7 mediterranean countries) – More on the adoption of a healthy Mediterranean diet
María de Guía Córdoba Ramos, *University Institute for Research in Agricultural Resources (ES)*

• FutureFoods
Véronique Lhoutellier, *INRAE (FR)*



THURSDAY 8 OCTOBER

15:20 - 15:50 **ORAL COMMUNICATIONS**

• GINO! Let's play not to waste food! A multistakeholder initiative to reduce food waste and foster plant-based diets in school canteens
Alice Minichini, *Fondazione Compagnia di San Paolo (IT)*

• School-Based Intervention for more sustainable and healthy diets: a primary school case study
Leire Osuna-Galisteo, *Basque Culinary Center (ES)*

15:55 - 16:25 **NETWORKING BREAK AND POSTER VISIT**

16:30 - 18:50 **SESSION 4: Challenges and future perspectives for meeting fruit & vegetable recommendations in sustainable food systems**

Co-chairs: Mphumuzi Sukati & Christian Reynolds

16:45 - 18:15 **KEYNOTE LECTURES**

• Assess to transform: improving measurement of nutritional, economic, and environmental dimensions
Wendy Gonzalez, *The Global Alliance for Improved Nutrition (CH)*

• Encouraging committed food choices without sacrificing pleasure: a cultural and sensory challenge from childhood onwards
Sandrine Monnery-Patris, *INRAE (FR)*

• Designing Inclusive Pathways to Fruit and Vegetable Consumption for Families Under Constraints: When motivation is not the problem
Vicky Drapeau, *Laval University (CA)*

• Improving communication and engagement: educational strategies for behavior change
Sylvie Avallone, *Institut Agro Montpellier (FR)*

• Health Professionals as Key Intermediaries: Addressing the Adult Nutrition Safety Net Gap in Sustainable Food Systems
Chi-Chi Ekhator, *Chi-Chi Ekhator (UK)*

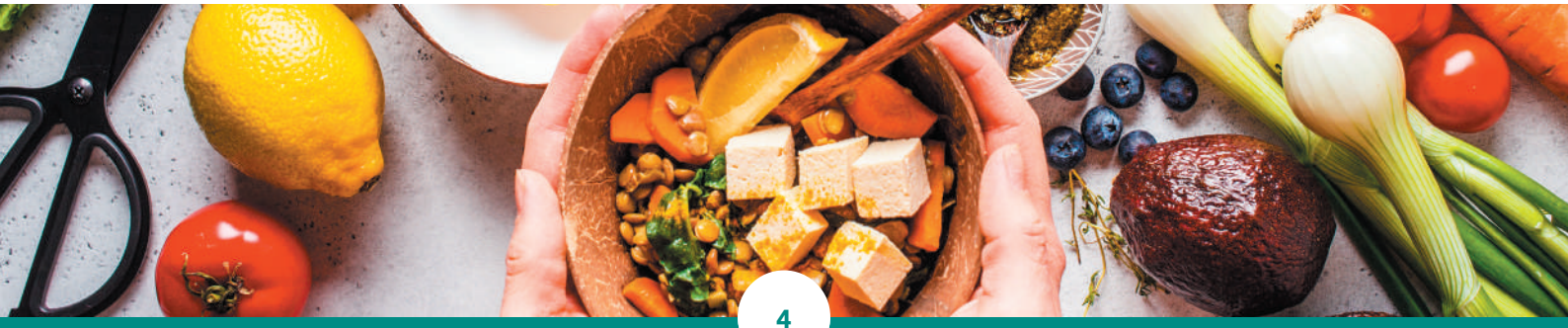
18:15 - 18:45 **ORAL COMMUNICATIONS**

• MATILDA - a global assessment tool for mapping demographic patterns and priorities across nutrition and sustainability
Oliver Taherzadeh, *Leiden University (NL)*

• The dietary footprints and transition priorities of over 12,000 cities
Hongyi Cai, *Leiden University (NL)*

• Pursuing dietary transitions requires reshaping global food production and trade networks
Shruti Jain, *Leiden University (NL)*

20:00 - 22:00 **GALA DINNER**





FRIDAY 9 OCTOBER

PROGRAMME

08:30 - 09:00 **WELCOME COFFEE**

09:00 - 11:40 **SESSION 5**: **Round table: From expectations to action: consumer perspectives on tomorrow's food system**

Co-chairs: Rémi Kahane et Sylvie Avallone

09:05 - 10:30 **PANEL DISCUSSION**

Aleksandra Nicolle, *SNRC (FR)*
Fabrice Declerck, *CIAT, Chief Science Officer at EAT (FR)*
Ana Isla Ramos, *FAO (IT)*
Marie Massart, *Mairie de Montpellier (FR)*
Pierre-Yves Romelaerre, *La nouvelle cantine (FR)*
Thouraya Tabbassi, *Consumer defense organization (TN)*

10:30 - 11:00 **ORAL COMMUNICATIONS**

• Retail access and Fruit and Vegetable acquisition choices: Implications for food Waste among Supplemental Nutrition Assistance Program (SNAP) participants
V. Chebolu-Subramanian, *Drexel University (USA)*

• Mind the Agriculture-Health-Gap: Aligning European Food Supply with National Dietary Guidelines and Planetary Health Diet
Anna-Lena Klapp, *ProVeg International (GE)*

11:10 - 11:40 **SHORT ORAL PRESENTATION SESSION**

• Gender differences in eating habits and lifestyles of young students: results from MaestraNatura program
A. Silenzi, *Italian National Institute of Health (IT)*

• Measuring consumers' acceptability of dietary change scenarios: experimental evidence from France
S. Teyssier, *Grenoble Alpes University (FR)*

• Optimization of dietary patterns for reducing non-communicable disease burden using dose–response-based DALY minimization
A. Parlesak, *University of Copenhagen (DK)*

• Does migration from French overseas regions to mainland France affect diet quality and fruit and vegetable consumption? The case of students from overseas regions
M. Antoine, *Montpellier University (FR)*

11:40 -12:00 **CONCLUSIONS OF THE CONFERENCE**

Christel Teyssèdre *(FR)*
Joël Doré & Bibi Giyose *(FR/ZA)*

12:30 - 17:00 **FIELD VISIT TO LA CAISSE ALIMENTAIRE DE MONTPELLIER**

Vegetable consumption patterns among patients with obesity and their association with ional and dietary habits

AUTHORS AND INSTITUTIONS J. Gligorijević[(1,2)]*, J. Todorović[(3)]

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Unpublished

Conflict of Interest: J. Gligorijević is a consultant for Foundation for Fresh Produce. J. Todorovic has no conflict of interest.

OBJECTIVES

Given their low energy density and high micronutrient and fiber content, vegetable consumption plays an important role in the prevention and management of obesity. In clinical settings, we have observed that patients with obesity often report inadequate vegetable intake. This study aims to examine vegetable consumption habits among patients with obesity, as well as the association between vegetable intake, lifestyle factors, and broader dietary patterns.

METHODOLOGY

This cross-sectional study analyzed data from consecutive patients with obesity seen for the first time at the Outpatient Unit of Dietetics, University Clinical Center of Serbia, between September and December 2025. Data from 100 patients were included in the analysis. The outcome variable was the total number of servings of vegetables consumed on the day prior to the visit, obtained by a 24-hour dietary recall.

RESULTS

A total of 76 patients (76%) were female, with a mean age of 46.50 ± 12.25 years. The majority of patients lived in urban areas (86%). The mean Body Mass Index (BMI) was 39.40 ± 5.99 kg/m². A total of 50% of patients had hypertension and 22% had diabetes.

Average vegetable consumption on the day prior to the visit was 1.61 ± 1.12 servings. Specifically, 11% of patients did not consume vegetables, 7 % consumed less than 1 serving, 38% consumed 1 to 1.5 servings, 27% consumed 2 to 2.5 servings, 11% consumed 3 to 3.5, and 6% consumed ≥ 4 servings. Legumes (beans) were consumed by 5% of patients. Starchy vegetables, primarily potatoes, accounted for 30% of intake (0.47 ± 0.84 servings).

The number of daily vegetable servings was negatively correlated with work-related physical activity ($r = -0.218$, $p=0.029$), number of servings of grains per day ($r = -0.221$, $p = 0.027$), and use of dairy products ($r = -0.220$, $p = 0.028$).

CONCLUSION

Only 17% of patients with obesity consumed the recommended three servings of vegetables on the day preceding their initial examination, and only 5% consumed legumes (beans). Non-starchy vegetable intake (excluding legumes) was very low, at 1.1 ± 0.79 servings.

Patients engaged in physically demanding occupations consumed fewer vegetables; this correlation may be attributed to lower-income roles and lower educational attainment, as well as the consumption of ultra-processed and fast-food during work hours. Additionally, patients with a higher intake of dairy products and grains - most notably bread and pastries - exhibited lower vegetable consumption. Further research is needed to investigate the long-term impact of these dietary patterns on weight management and to develop targeted interventions for high-risk occupational groups.

Changes in the FODMAP content of onions during long-term cold storage

AUTHORS AND INSTITUTIONS C. Aubert[(1)] *, P. Sanvicente[(1)] , G. Chalot[(1)]

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Unpublished

OBJECTIVES

Irritable bowel syndrome (IBS) is a common functional gastrointestinal disorder characterized by abdominal pain, bloating, diarrhea and/or constipation. Fermentable dietary carbohydrates, collectively known as FODMAPs (Fermentable Oligo-, Di-, Mono-saccharides, And Polyols), are recognized as dietary triggers that can exacerbate symptoms in sensitive individuals. Onions are among the most widely consumed vegetables worldwide and represent a major contributor to total dietary FODMAP intake, primarily due to their high fructan content. However, information regarding changes in the FODMAP composition of onions during long-term storage remains limited. The aim of this study was therefore to determine, using UPLC-MS, the levels of sugars, fructans, fructooligosaccharides (FOS; kestose and nystose), galactooligosaccharides (GOS; raffinose, stachyose, and verbascose), and polyols (sorbitol and mannitol) in two onion varieties (*Allium cepa L.*) during long-term storage.

METHODOLOGY

Two varieties of mature onions (Allium cepa L. cv. Hybound and Hybelle) were harvested in September 2025 near Béthune (Pas-de-Calais, France). Following harvest, the bulbs were cured at 25°C for one month and subsequently stored at 1°C for up to nine months in total, including the curing period. Analyses were performed at harvest and after 6 and 9 months of total storage. Hybound was also analyzed after 1 and 3 months. Sugars, polyols, FOS and GOS were determined as described by Jaime et al. (2001) with some modifications. Total fructan content was determined following enzymatic hydrolysis with an inulinase (E-FRLQPU; mix of exo-inulinase (EC 3.2.1.80) and endo inulinase (EC 3.2.1.7); ratio of 25:1) from LIBIOS (Vindry-sur-Turdine, France). UPLC-MS analyses were performed on an ACQUITY UPLC system coupled to a mass single-quadrupole detector (QDa, Waters, Milford, MA, USA), which is a compact detector with an electrospray ionization (ESI) interface. Chromatographic conditions were as described by Benvenuti et al. (2016) with some modifications. Separation was carried out at 70°C using a Waters Acquity BEH Amide column (100 mm × 2.1 mm i.d., 1.7 µm). Mobile phase was ACN/H2O/NH3 (65/34/1) with 10mM of ammonium formate and 500 ppb of guanidine hydrochloride. Flow rate was 0.8 ml/min. Injection volume was 1 µL.

RESULTS

The results mainly showed that total fructan and FOS levels drastically decreased after 6 and 9 months of total storage period. They also indicated that fructose concentrations were systematically lower than those of glucose and therefore does not represent a major FODMAP contributor in our samples. Sorbitol and mannitol were not detected in this study. As regards GOS, only traces of raffinose were detected in both cultivars after 6 and 9 months of storage.

CONCLUSION

This study clearly shows that prolonged storage significantly reduces the FODMAP content of onion bulbs and suggests that stored onions could be a more suitable alternative for consumers with IBS than freshly harvested onions.

References

Benvenuti, M. ; Cleland, G. ; Burgess, J. Profiling mono and disaccharides in milk and infant formula using the ACQUITY Arc system and ACQUITY QDa detector, Waters application note 720005767en; Waters Corporation, 2016.

Jaime, L., Martín-Cabrejas, M. A., Mollá, E., López-Andréu, F. J., & Esteban, R. M. (2001). Effect of storage on fructan and fructooligosaccharide of onion (Allium cepa L.). Journal of Agricultural and Food Chemistry, 49(2), 982-988.

Fruit purées can preserve the antioxidant quality of fresh fruits

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Unpublished

OBJECTIVES

Fruit consumption contributes to chronic disease prevention through the intake of antioxidant compounds. Processed fruit products such as purées are widely consumed, yet their nutritional equivalence to fresh fruits remains debated. This study aimed to compare antioxidant-related nutritional markers in fresh fruits and industrial fruit purées and to evaluate their stability during refrigerated storage.

METHODOLOGY

Four fruits (strawberry, raspberry, apricot, and pear) were analyzed as fresh products and as industrial purées obtained through two thermal processes, with or without the addition of ascorbic acid. Purées were assessed at 0, 45, 90, and 120 days of storage at 4°C. Samples were freeze-dried and ground prior to analysis. Total phenolic content was quantified using the Folin–Ciocalteu method and expressed as gallic acid equivalents. Antioxidant capacity was determined using the DPPH assay and expressed as Trolox equivalents. Carotenoid content was estimated spectrophotometrically as β-carotene equivalents. All analyses were carried out in triplicate, and statistical analyses were performed using Dunn's test of multiple comparisons following by a significant Kruskal-Wallis test ($p < 0.05$) with RStudio software.

RESULTS

Phenolic content showed minimal variation between fresh fruits and purées and remained largely stable during storage. Antioxidant capacity followed similar trends, indicating that processing and refrigerated storage up to 120 days had limited effects on global antioxidant activity. In contrast, carotenoids exhibited greater sensitivity to processing and storage, with losses ranging from approximately 20% to 60% depending on fruit type, particularly in pear samples. However, variations were often modest and partly attributable to natural sample variability.

CONCLUSION

Industrial fruit purées retained most total phenolic content and antioxidant capacity found in fresh fruits, supporting their role as nutritionally relevant alternatives in fruit consumption. Although carotenoids were more affected by processing and storage, overall antioxidant integrity remained largely preserved. These findings support the inclusion of fruit purées within healthy diets, particularly where access, convenience, or food safety limit fresh fruit consumption.

Produce Prescriptions support diabetes management

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OBJECTIVES

Poor dietary quality contributes to risk of chronic conditions such as cardiovascular disease, hypertension, and type 2 diabetes. Low-income populations carry a disproportionate burden of diet-related diseases, in part due to limited access to healthy food and low produce consumption. Produce prescriptions, which provide fruits and vegetables (FV) to patients at no cost as a component of their healthcare services, could reduce food insecurity, increase FV consumption and improve diet-related disease management. To support access to FV, we implemented a Produce Prescription (Produce Rx) program for patients with diabetes or prediabetes. The main objective of this study was to evaluate the impact of the Produce Rx program on patients' blood glucose levels. Secondarily, we aimed to assess the program's impact on FV consumption and food security.

METHODOLOGY

We used a pre/posttest single group study design, with measurements at enrollment (baseline) and the 6th month of participation (endline). The study was conducted in three safety net community clinics that operate in California. The sample included patients with diabetes or prediabetes, who received care at one of the three study sites, were newly enrolled in the Produce Rx program and able to communicate in English or Spanish. The Produce Rx program provided patients with six months of produce ($70/month) as vouchers to be redeemed at farmers markets or as pre-loaded cards to use at a grocery store, in addition to the standard clinical care provided at the community clinics.

The main study outcome was HbA1c in % of total hemoglobin units and extracted from electronic medical records. Secondary outcomes included self-report of FV consumption (calculated as number of cups from responses to a 10-item food frequency questionnaire), direct measurement of skin carotenoid levels (measured in triplicate with the VeggieMeter®), a biomarker for FV intake, and food security (assessed using the six-item US Department of Agriculture scale).

We analyzed the data using mixed effects linear or Poisson regression with long data, time (endline vs. baseline) as fixed effect, and subject nested within site (community clinic) as random effect. We visually inspected the distribution of residuals to confirm the suitability of the models.

RESULTS

Out of 184 participants with baseline data, 161 (88%) completed the endline survey. At endline, HbA1c values were lower than at baseline (-0.60; p=0.003), while skin carotenoid values (p=0.005) were higher. The number of cups of fruits or vegetables consumed at endline did not differ from that at baseline (p=0.603 and p=0.728). Food insecurity was significantly lower at endline vs. baseline (p=0.004).

CONCLUSION

Interventions that increase access to fruits and vegetables can support diabetes management and food security for patients from low-income households.

Urban farming improves dietary diversity of caregivers and children in informal settlements in Nairobi

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Unpublished

OBJECTIVES

To assess the effectiveness of urban farming in improving dietary diversity and quality, among women and girls (12-49 years) and their children aged between 6 and 23 months in Korogocho and Viwandani informal settlements, Nairobi.

METHODOLOGY

We conducted a before-and-after quasi experimental study to assess the impact of small space crop and livestock farming on dietary diversity in the two informal settlements working with community organized groups between April 2021 and May 2024. Korogocho and Viwandani were our intervention sites while Mathare was the control site. Baseline and end line household surveys were used to collect quantitative data on socio-demographics, household food security and farming practices ; women's and children's dietary practices.

RESULTS

Repeated cross-sectional data was collected from 414 (302= intervention group) and 423 (205=intervention group) caregiver-child pairs at baseline and endline respectively. Only (19.2% intervention, 29.5% in the control) of children consumed a diverse diet (at least 5 of 8 food groups) at baseline. At endline, there was an increase in the proportion of children who consumed a diverse diet in the intervention group (28.3% intervention, 20.6% control) and the dietary diversity score. The proportion of caregivers who attained the minimum dietary requirements increased by more than 20%, rising from 5% pre-intervention to 27.3% after follow-up in the intervention arm; while the proportion also increased from 5.4% to 13.8% among caregivers in the comparison group.

CONCLUSION

This study shows that practicing urban farming in informal settlements can improve dietary diversity among women and children.

Promotion of consumption of fruits and vegetables among Romanian children

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Unpublished

The author has no conflict of interest.

OBJECTIVES

This study aims to present strategies, educational approaches and materials as well as learned lessons with regard to promotion of consumptions of fruits and vegetables among Romanian children from Romania.

METHODOLOGY

The presentations will include several examples of educational activities implemented in schools from different counties of Romania between 2016-2026, paying attention to their development, implementation, evaluation and dissemination.

RESULTS

In 2016 the program STIVIA was developed with the aim to facilitate school based education for promotion of healthy nutrition and active lifestyle, one important educational objective being promotion of consumption of fruits and vegetables as part of a comprehensive nutritional education for elementary and secondary school children from Romania. The program proposes 9 structured lessons, one of them being dedicated to consumption of fruits and vegetables. In order to facilitate its implementation educational materials using videos, books for children, posters were prepared, while parents were informed and motivated to further discuss and apply the advices offered at school through newsletters and educational activities for parents at school. Educational approaches for pupils included presentations, active involvement of pupils through discussions, individual and group activities, contests, creative activities, guided practice, degustation of fruits and vegetables. There were used several approaches to facilitate implementation and dissemination of the program or some of the lessons, with a special focus on the activities promoting consumption of fruits and vegetables: presentation of the program at different scientific and educational events, partnership with schools from different counties, taking advantage of the interest of schools to organize health education activities during 2 weeks when schools are encouraged to implement extra-curricular activities, some of the topics of interest being health and environmental education, involvement of medical und PhD students in implementation of activities, combing research and health promotion activities, offering easy to implement, well prepared plans and educational materials for teachers, offering the videos also in sign language for children with hearing deficiencies. Process and effect evaluations of activities performed in different formats showed positive effects.

CONCLUSION

The paper presents strengths and limitations of the activities and approaches used and based on the lessons learned makes recommendations for future health promotion activities to promote consumption of fruits and vegetables among Romanian children.

Tomato powders as sustainable processed products of nutritional interest

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Unpublished

OBJECTIVES

Tomato consumption is associated with a significant reduction in cardiovascular risk factors [1]. Although tomato is a recognized source of vitamin C, carotenoids and phenolic compounds, glycoalkaloids and triterpenoids were only recently taken into consideration although evidences of their in vitro bioactivity are accumulating [2,3]. Because composition alone does not fully capture a fruit's nutritional value, this study aimed at evaluating the effect of tomato processing on product composition and in vitro bioaccessibility of phenolic compounds, carotenoids, glycoalkaloids and triterpenoids. Bioaccessibility is defined as the fraction of a phytoconstituent ready for absorption or the exercise of a health benefit directly in the GI tract. o-diphenolic compounds were previously demonstrated to protect □-6 PUFA from oxidation during digestion [4]

METHODOLOGY

Cold- and hot-break processings (CB, HB) of the Sailor genotype were led at the pilot scale for the production of a juice and the corresponding concentrate after evapo-concentration. Tomato powders were next obtained after juice freeze-drying and concentrate spray-drying using maltodextrin and a coacervate carriers. The bioaccessibility of tomato phytoconstituents was assessed in an in vitro model of gastrointestinal digestion using standardized conditions [5]. Metmyoglobin-initiated lipid oxidation of a sunflower oil-in-water emulsion simulated the digestion of a Western-type meal rich in ω-6 PUFA and red meat [6]. Analyses of polyphenols and glycoalkaloids were performed by LC-DAD-MS^n, carotenoids by LC-DAD and triterpenoids by GC-MS.

RESULTS

Cold- and hot-break processings did not significantly affect the contents in carotenoids, triterpenoids and phytosterols in the concentrate while the content in phenolic compounds was more drastically decreased by CB (- 46%) than HB (- 17%) with the difference being assessed to a superior flavanone loss in CB compared to HB.

Freeze-drying further decreased phenolic compounds by ca. 20% for CB and HB juices, glycoalkaloids by 50%, carotenoids by 75% and triterpenoids by 90% without affecting phytosterols. Spray-drying had similar effects although being more degrading for carotenoids.

Phenolic compounds, rutin, naringenin and chlorogenic acid, displayed close bioaccessibilities in the gastric phase (20-40%) and in the intestinal phase (10-28%) for all the products. The bioaccessibility of glycoalkaloids was greatly improved for powders (35-80% in the gastric phase) compared to tomato juice and concentrate (< 10%). In line with literature data, the in vitro intestinal bioaccessibility for carotenoids was low (< 1%) and increased to 4% for the spray dried powders.

Finally, these powders could inhibit lipid oxidation in the in vitro digestion of a Western-type meal.

CONCLUSION

Hot-break processing appears more protective of health beneficial phytoconstituents than cold-break processing. Besides, freeze-drying and spray-drying decreased most phytoconstituent's contents although improving their in vitro bioaccessibility. Tomato processed products may thus be sustainable and health beneficial alternatives to seasonal fresh tomato and could advantageously contribute to the five portions of F&V per day.

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Ready meals: nutritional quality, connection with dietary risk factors for non-communicable diseases, and environmental impacts

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Conflict of Interest: All authors declare no conflicts of interest

BACKGROUND

Convenience foods are common in Western diets, driven by time poverty and deskilling. Ready meals are industrially produced, pre-cooked and pre-packaged, sold at retail stores, and require heating only. Ready meals, including pizzas, are frequently consumed in the UK, observing 1.0% market growth in 2025 (Withers, 2025). Typically low in fibre and high in salt and saturated fat, ready meals contribute to poor diet quality where few adults meet the 5-a-day or 30g fibre recommendations and obesity prevalence remains high. From a planetary health perspective, the food system contributes significantly to greenhouse gas emissions. Ready meal reformulation, through incremental increases in vegetable and legume content, could generate health and environmental co-benefits. Yet, research rarely integrates these dimensions. This systematic review aimed to consolidate evidence on health- and environmental-related outcomes associated with ready meal consumption.

OBJECTIVES

1. To assess current evidence on the ingredient and nutritional composition of ready meals worldwide.
2. To assess evidence on the association between ready meal consumption and health-related outcomes (BMI, waist circumference, and obesity) and dietary-related patterns.
3. To identify the environmental impacts associated with the production and consumption of ready meals.

METHODOLOGY

This review combined the PRISMA and FLAVIA-LCT frameworks. The protocol was registered with PROSPERO: CRD42024504545 (Eagles et al., 2024). Searches were conducted in PubMed, Science Direct, and Web of Science in September 2024, October 2025, and July 2026. Searches combined MeSH and key terms for ready meals and outcomes, including ingredient and macronutrient composition, dietary-related patterns, BMI/waist circumference, overweight/obesity, and environmental impacts. Titles, abstracts, and full texts were screened against predetermined criteria. Findings will be synthesised narratively due to heterogeneity. Fifty-two studies (55 articles) met the inclusion criteria. 47% reported nutrient content, although several were limited to single nutrients and 29% examined dietary-related patterns. Only two studies reported BMI or obesity outcomes, and six included environmental impact indicators.

RESULTS

Salt and saturated fat content frequently exceeded recommended intake, while ingredient composition, including vegetable servings, was rarely reported. Dietary behaviour findings were mixed and not directly comparable, but ready meals were often consumed within convenience-oriented patterns. Evidence for BMI/obesity associations was limited: one study reported no association, while another observed a positive association with obesity among women only. Environmental impact indicators varied, with global warming potential most frequently reported. Animal-based ingredients contributed the largest share of environmental impacts.

CONCLUSION

Ready meal studies are scarce, highlighting the need for research integrating nutritional, environmental, and food systems science to evaluate structural interventions such as mandatory reformulation. This review provides knowledge to help identify how the nutritional profiles and environmental footprints of ready meals may be improved. Further, research gaps will inform future research into synergies and trade-offs between nutritional quality and environmental impacts when adjusting ready meal ingredient composition.

How do current meat reducers in the action stage, those in the maintenance stage and former meat reducers differ from one another?

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Unpublished

OBJECTIVES

Despite recent advance of knowledge about stages of change in meat reduction, most empirical studies focused on the comparison between the (pre-)contemplation stage and the combined stages of action and maintenance (e.g., Hielkema & Lund, 2021; Strassner & Hartmann, 2021; Strässner & Wirth; 2024). This practice has made it difficult to explore how some flexitarian consumers develop their low-meat meal routines while others find it difficult to do so. Given that many individuals who have begun to reduce meat consumption end up giving up the attempt to do so within a few months (Grassian, 2024), it is important to fill the gap of research and compare current meat reducers in the action stage, those in the maintenance stage and the individuals who have given up the meat reduction goal (i.e., former meat reducers). Thus, the purpose of the study is to compare the three subgroups of meat reducers in their meat reduction goal setting, goal pursuit and how they deal with occasional lapses and feelings of demoralization.

METHODOLOGY

We conducted a cross-sectional online survey with Canadian university students who have recently tried to reduce meat consumption and are currently reducing meat intake (N=289). Adapting the Stages of Change framework (Prochaska & DiClemente; 1983), we divided participants into three groups: former meat reducers, current meat reducers in the action stage and current reducers in the maintenance stage. Instead of following the arbitrary 6 month cut-off for distinguishing people in the action stage versus those in the maintenance stage, we assigned participants who indicated having found and followed their routines in low-meat meals to the maintenance stage and those who were going through trials and errors to the action stage.

RESULTS

Our hypothesis that diet identity as unrestricted meat eaters would be lower among meat reducers in the maintenance stage than those in the action stage, in turn followed by former meat reducers (H1) was supported. Furthermore, the hypothesis that meat attachment would be lower for flexitarians in the maintenance stage than for those in the action stage, followed by former meat reducers (H4a) received partial support. Lastly, the hypothesis that meat ambivalence in the action stage would be higher for flexitarians in the action stage than those in the maintenance stage or former meat reducers (H4b) received partial support.

CONCLUSION

Our findings indicate nuanced differences among the three subgroups of meat reducers although some between-group differences were overshadowed by relatively large within-group variation. Our findings offer practical implications for increasing the intake of fruits and vegetables as well as other plant-based food among flexitarian consumers. However, given the nature of our exploratory study, we call for more systematic empirical research on subgroup differences among former and current met reducer subgroups.

From Sender to Receiver: Investigating Children's Roles in Food Communication Through a Randomized Controlled Trial

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OBJECTIVES

The shift toward healthier and more sustainable diets is a major societal concern, with public policies increasingly targeting childhood overweight and obesity. Many interventions focus on children because dietary habits are still forming and remain relatively malleable at young ages (Capacci et al., 2012). Since 2001, France's national nutrition strategy has combined regulation with large-scale information campaigns, notably the MangerBouger program (2007), which mandates standardized health messages in food advertising. These messages are now widely recognized by the population. Despite their visibility, such top-down informational approaches have shown limited long-term effectiveness in changing food behaviors or reducing nutritional inequalities (Kim et al., 2019). Peer education offers an alternative pathway by leveraging social proximity, shared norms, and imitation processes within classrooms. Experimental and quasi-experimental evidence shows that children respond to both incentives and peer behavior and can transmit nutritional messages to their families, generating spillover effects beyond schools (Griffith et al., 2018; Belot et al., 2016; Fortin and Yazbeck, 2015; Maurice, 2018). The present study proposes a randomized controlled trial (RCT) to investigate how the source of nutritional messages, teacher versus peer, affects children's food consumption and related preferences.

METHODOLOGY

Conducted during the 2025–2026 school year, the experiment involves 298 pupils aged 8 to 10 recruited from ten different schools. The design compares two treatments featuring distinct message providers and one control group receiving no message. Data collection proceeds over four phases: (i) a baseline period prior to the intervention (November 2025), (ii) the intervention period (January 2026), (iii) an immediate post-intervention phase (February 2026), and (iv) a follow-up conducted three months later. The primary outcome is the quantity of fruits and vegetables consumed in the school canteen. Using an app, which relies on AI, consumption is measured objectively by photographing each child's tray at the beginning and end of each meal, allowing us to capture both intake and waste. We also collect detailed data on children's social networks using a nominative method, enabling the identification of friendship ties and peer exposure within classrooms.

EXPECTED RESULTS

Beyond estimating average treatment effects, the study aims to explore behavioral mechanisms. Network mapping will enable comparisons between structural peer influence. As data collection is ongoing and the intervention took place in January/February, no results are available at this stage. Nevertheless, we expect to present preliminary findings at the conference.

CONCLUSION

This RCT aims to inform the design of more effective and scalable nutritional interventions targeting young people by comparing message providers and embedding analysis within classroom social structures. The findings have potential implications not only for school-based nutrition programs but also for broader strategies promoting sustainable and healthy food practices across households and communities.

From policy to practice: A multinational analysis to identify factors that influence the implementation of food-based dietary guidelines by health and nutrition professionals

AUTHORS AND INSTITUTIONS

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Unpublished

Conflict of Interest statement: A-LK and VG are employees of ProVeg International, a non-governmental organization. A-LK and JPS are affiliated with the University of Göttingen. AR holds a professorship at the University of Applied Sciences in Fulda and leads a BMBF-FONA research group at the University of Göttingen. This research was conducted independently of organizational influence, and the design, data analysis, and conclusions presented are exclusively those of the authors. The authors declare no other potential conflicts of interest.

OBJECTIVES

Food-based dietary guidelines (FBDGs) are essential tools for promoting healthy, sustainable diets, yet global adherence is low. Health and nutrition professionals are key to translating these policies into practice, but the factors influencing their implementation efforts remain under-researched. This study aimed to identify factors influencing FBDG implementation from the perspective of health and nutrition professionals and to explore opportunities for strengthening implementation.

METHODOLOGY

Using a socio-ecological framework, this study employed an exploratory sequential mixed-methods design. Phase 1 involved 20 semi-structured qualitative interviews exploring global professionals' experiences with the use, design, and implementation of FBDGs, alongside the role of governmental and institutional stakeholders. Insights from Phase 1 were operationalized into Likert-type scale items and multiple-choice questions to develop Phase 2, a quantitative online survey ($n = 118$). The 43-item questionnaire evaluated five core dimensions: professional background, FBDG usage patterns (e.g., in counseling or lectures), perceived design characteristics (e.g., underrepresented food groups), specific barriers to implementation, and critical policy or community-level support factors. Data were analyzed using deductive content analysis and descriptive statistics.

RESULTS

While 80.5% of professionals use FBDGs in practice, 57.6% rate them as only «somewhat» or «slightly» helpful in promoting healthy, sustainable food choices. Major barriers include perceived food industry influence (83.0%) and public misinformation. Facilitators include the «plate» visual format (77.1%) and the inclusion of more plant-based options. Critically, professionals advocate for systemic change, identifying fiscal policies - such as subsidies for healthy foods and tax reductions on vegetables and legumes - as essential to address cost barriers and create supportive food environments. Furthermore, inclusive designs that account for diverse cultural and nutritional philosophies are viewed as vital for increasing professional implementation.

CONCLUSION

Health and nutrition professionals encounter multiple barriers and facilitators in implementing national FBDGs. Policy makers and scientific committees should address these barriers and leverage facilitators to improve FBDG development and implementation. Findings provide initial valuable insights for future research and policy efforts aimed at promoting healthy and sustainable diets.

ETHICAL APPROVAL

The study protocol was reviewed and cleared by the University of Goettingen Research Ethics Committee (Qualitative phase: 13.07.2023; Quantitative phase: 28.02.2024). All participants provided informed consent prior to participation.

Comparative effects of immediate vs. delayed financial incentives on fresh fruit and vegetablepurchases among low-income households

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Unpublished

Conflict of interest: The authors declare that they have no conflicts of interest in relation to this article.

OBJECTIVES

In France only 13% of adults and 19% of young people meet the National Nutrition and Health Program (PNNS) recommendations (Nutrimetrie Study 2024). Income and price are major barriers to purchasing fruits and vegetables (Darmon & Drewnowski, 2008; Drewnowski & Specter, 2004). Low-income households in France purchase approximately 26% fewer fresh fruit and vegetables than the national average (Kantar, 2024). Financial incentives have been shown to increase consumption in the short term (French et al., 2001; Huangfu et al., 2024). However, several gaps remain: few studies compare different incentive mechanisms, although their effectiveness depends on the mechanism (Olsho et al., 2016; Brownback et al., 2023); most experiments are conducted in North America, limiting transferability to the French context; and post-intervention effects are rarely evaluated, despite their importance for long-term behavioral change. This study aims to identify a short-term effective incentive mechanism that also fosters internalization of purchasing behaviors in France.

METHODOLOGY

We conducted an online randomized controlled experiment with 450 French households, assigned to three groups: (i) control, (ii) immediate financial incentive, and (iii) delayed financial incentive. The immediate-incentive treatment received a voucher for fresh fruit and vegetables, which was deducted directly from the amount payable. The reimbursement group paid the full amount and received a refund for their fruit and vegetable purchases after the transaction, upon delivery of their order. The experiment took place on an experimental online shopping platform simulating a realistic purchase environment. Incentive's amounts were calibrated to cover the equivalent of two servings of fruits and vegetables per person per day. The budgets allocated during the experiment were based on household size and average Kantar purchases.

The study was approved by the Research Ethics Committee at the University of Paris-Nanterre (France) (Approval No.: 2025-07-2).

RESULTS

The delayed rebate significantly increases fresh fruit and vegetable purchases compared with the control group, while the effect of the immediate voucher is only marginally significant. No significant difference is observed between the two financial incentives during the intervention period. Furthermore, there is no evidence that individual present bias influences responsiveness to the incentives. In terms of motivation, the delayed rebate is associated with lower controlled motivation and a higher relative autonomy index, whereas the immediate voucher has no significant effect. For both incentive schemes, the increase in fresh fruit and vegetable purchases remains smaller than the value of the incentive received, suggesting a redistribution effect. Finally, although a few reductions are observed in specific food subcategories, there is little evidence of a substitution effect, as expenditures in most non-targeted food categories remain unchanged or even increase.

CONCLUSION

This research aims to provide insights into the comparative effectiveness of financial incentive mechanisms applied to fruits and vegetables in the French context, considering both immediate purchase effects and the internalization of consumption behaviors for sustained impact.

Fruit and vegetable deconsumption, factors of evolution and levers for recovery in France

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Published: La déconsommation des fruits et légumes frais : facteurs d'évolution et leviers d'action - CTIFL

Conflicts of interest: The authors declare that they have no conflicts of interest in relation to this article.

OBJECTIVES

Faced with the decline in the purchase (volumes) of fresh fruit and vegetables observed in recent years on the French market, the objective of this study is to analyze the factors explaining the decline, through the evolution of purchasing and consumption behavior, and to identify levers of action to reverse the tendency.

METHODOLOGY

Analysis of the evolution's factors of purchases and consumption through socio-demographic changes and food consumption behaviors, by a state of the art (data INSEE, Kantar, etc).

Synthesis of studies carried out by the CTIFL on the consumption of fresh fruit and vegetables. A quantification of the factors driving the evolution of household purchases of fresh fruit and vegetables in recent years (2022-2024) (Kantar study).

The definition of 10-year development scenarios and the identification of action levers to boost consumption.

The levers found by this study were then presented and discussed through foresight workshops with professional actors of the sector.

RESULTS

Socio-demographic and lifestyle changes include changes that go against the consumption of fresh fruit and vegetables. Furthermore, other factors such as food supply, including industrial products (eg prepared meals, frozen food), public policies, climate change have contributed to lower the purchase of those fresh products. The analysis of purchasing behavior shows that this evolution is the result of both a decrease in the frequency of purchases and a reduction in the quantities purchased for each act. In an inflationary context, some households, especially the most modest, are arbitrating to the detriment of items where they still have room for maneuver, including food. Lifestyles are also changing individualization of meals, development of non-meal meals (snacking), simplification of the plate with the gradual disappearance of the starter – often composed of raw vegetables – and loss of culinary know-how. However, levers of action exist to reverse the tendency: Improving the quality of the offer, its visibility, and adapting it to climate change; better knowledge, at all stages, of the product offer and consumer expectations; Valuing the pleasure of eating fresh fruit and vegetables.

CONCLUSION

Reviving the consumption of fresh fruit and vegetables requires the improvement of the offer from the field to the point of sale, to allow the pleasure of consuming products of optimal quality, linked to a better knowledge of the products and the best ways to buy, conserve, cook, from all the actors of the sector to the consumers, at home and out of home.

Sensory Evaluation and Determinants of Consumer Choice for French Pears

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Unpublished

OBJECTIVES

The French pear sector is undergoing renewed development through orchard replacement, the introduction of new varieties, and efforts to reduce dependence on imports. In this context, the Poire COCO project aimed to improve alignment between market supply and consumer expectations. The objectives were to characterize the organoleptic diversity of French pears throughout the season and to identify the main determinants of preference and choice among adults and young consumers, with particular attention to the emerging "crunchy pear" category. The project also addressed food education, as familiarity and positive sensory experiences may contribute to increasing fruit consumption among younger consumers.

METHODS

A multidisciplinary approach combined physicochemical measurements, sensory profiling, and consumer studies. Pears representative of the French commercial offer were monitored throughout the season for firmness, soluble solids content, titratable acidity, and weight. A trained sensory panel evaluated 11 texture, taste, and flavour descriptors, enabling the construction of sensory maps and the identification of distinct pear typologies.

Consumer studies involved 100 adults and 85 young consumers aged 10–18 years, all at least occasional pear consumers. Participants completed two tasting sessions including hedonic evaluations, together with questionnaires on purchasing habits, consumption patterns, and expectations.

RESULTS

Sensory profiling identified six pear typologies differing mainly in firmness, juiciness, sweetness, acidity, and aromatic intensity, demonstrating the broad sensory diversity of the French offer. Firmness was the most discriminating attribute, whereas soluble solids content showed limited correspondence with sensory perception.

The ideal pear was consistently described as juicy, sweet, melting, and aromatic. Adults and young consumers displayed very similar preference patterns, with Comice, Conference, and Angys® receiving the highest ratings. Contrary to expectations, young consumers did not show a stronger preference for firm pears.

Responses to crunchy pears were more segmented, but differences were not explained by age or gender. Purchasing decisions were mainly driven by visual appearance and price, while varietal information played a limited role. Immediate consumption after purchase also suggested limited knowledge of ripening and optimal eating stages.

CONCLUSIONS

The main barriers to pear consumption appear to be related less to intrinsic sensory quality than to limited familiarity with varieties and poor understanding of fruit maturity. New varieties combining extended consumption windows with satisfactory eating quality across different firmness levels could help diversify the offer, simplify consumption, and encourage pear intake, particularly among younger consumers.

How Children Think About Eating Fruits and Vegetables

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The authors declare no conflicts of interest.

OBJECTIVES

Adequate consumption of fruits and vegetables is associated with a lower risk of obesity and chronic diseases later in life, including cardiovascular disease, type 2 diabetes, and certain cancers (Dauchet et al., 2006; Van duyn & Pivonka, 2000). Encouraging children to eat enough fruits and vegetables is therefore a key strategy in disease prevention and in promoting lifelong health. Prevention relies on public health promotion campaigns. Regarding fruit and vegetable consumption, these campaigns may include messages related to well-being or sustainability. The present study aims to address a gap in the literature by examining children's representations of fruit and vegetable consumption in relation to health and sustainability, to ensure that the analytical framework is anchored in themes that are empirically meaningful and relevant to the child population. The data obtained were analyzed to propose intervention recommendations based on these representations, which may help encourage healthier choices in the school cafeteria.

METHODS

Twenty-one fourth-grade children aged between 8 and 10 years (17 girls, 4 boys) from two socioeconomically contrasted schools participated in four focus groups. Children were randomly assigned to a thematic group (health or environment). Discussions (34–58 minutes) were conducted using a structured interview guide designed to explore children's perceptions of the link between fruit and vegetable consumption and either health or the environment. Sessions were audio-recorded and transcribed verbatim. Data were analyzed using an inductive, semantic thematic analysis to identify recurring themes (Braun & Clarke, 2022).

RESULTS

A total of 169 excerpts were analyzed using NVivo (health: n = 110; environment: n = 59). Three overarching themes emerged for each condition. Health-related representations were predominantly individual and concrete, linking fruit and vegetable consumption to short-term and personally meaningful benefits (e.g., energy, attention, self-image). Environmental representations were less elaborated and more frequently framed in collective terms, emphasizing shared responsibility and altruism rather than immediate personal consequences.

CONCLUSION

The study of children's representations of fruit and vegetable consumption highlighted a shared characteristic: their association with personally meaningful experiences. In fact, the present findings indicate that long-term health or environmental outcomes (e.g., cardiovascular disease or pollution), although frequently emphasized in food education and known to children, are perceived as distant and insufficiently salient. Consequently, messages anchored in immediate benefits (such as increased energy levels) or related to their representations (reflecting an environmental imaginary centered on proximity to nature and low industrial transformation) appear more meaningful and engaging for them. Food education programs may therefore benefit from integrating knowledge with tangible experiences and interpretive frameworks rooted in children's perspectives. Overall, these findings underscore the importance of experiential and context-based educational approaches.

Opportunities for integrating locally produced and procured food into school food provision in the Pacific Islands

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Unpublished, technical report available online (https://www.aciar.gov.au/publication/hort-2021-159-final-report, published August 2024).

OBJECTIVES

Home-grown school feeding approaches that engage local producers have expanded globally, providing nutritious meals for schoolchildren while supporting smallholder livelihoods and rural economies. However, these models, and school food provision more broadly, have received limited attention in the Pacific Islands region. Given the region's geographic and cultural diversity, high rates of diet-related non-communicable disease, and the impact of climate change, it is timely to identify locally appropriate models for providing food in schools. This study explored how local food production could be integrated into school food provision across Pacific Island Countries and Territories (PICT).

METHODS

This mixed-methods study was conducted across 22 Pacific Island Countries and Territories (PICT) that are members of the Pacific Community (SPC). The first stage involved a systematic scoping review of empirical and grey literature related to school food activities across the region. This was supplemented by 41 semi-structured interviews to verify findings and collect additional information. Six countries were then selected for in-depth case studies, involving interviews with key stakeholders (n= 13) to explore current activities, opportunities and barriers. The third stage consisted of a regional validation workshop with 20 stakeholders, to assess the feasibility of home-grown school feeding approaches and identify preferred models.

RESULTS

Limited empirical and grey literature was identified (n=12 sources), primarily on school feeding, school gardens, school canteens, and school curricula. Twenty-two school feeding programmes were identified, varying in size and scope. Of these, eight required the use of local foods, and two reported sourcing local foods voluntarily. Most arrangements between farmers and schools were informal. Key challenges of using locally produced and procured foods in schools were resourcing (human, financial and physical infrastructure), limited opportunities for staff development and capacity building, and environmental conditions. Opportunities existed for using traditional farming systems and school gardens, diversifying farming practices, improving food security, providing opportunities for women, enhancing educational outcomes and improving partnerships. While most stakeholders supported the use of locally produced and procured foods in the long term, a hybrid model combining local and imported foods was considered more feasible and sustainable in the short term.

CONCLUSION

Home-grown school feeding approaches show promise across the Pacific, but current programmes remain limited in scale and formalisation. Stakeholders expressed strong support for greater use of local foods, although hybrid models are likely to be more feasible in the near term. Strengthening local supply chains, formalising farmer to school linkages, and tailoring models to diverse national contexts will be critical to scaling sustainable school food provision across the region.

Multidimensional optimization of sustainable dietary solutions for Europe

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Unpublished

Conflict of interest: This PhD project is partly funded by Arla Foods. The authors declare no other conflicts of interest.

OBJECTIVES

The rising burden of non-communicable diseases (NCDs) and the environmental pressures of current food systems call for dietary strategies that support human health and long-term sustainability. The HEAT project (name of the PhD project, and stands for Health and Environmental Assessment of Diet Transition) aims to develop a multidimensional optimization framework to identify dietary patterns that balance health, environmental impact, cultural acceptability, and economic feasibility across ten European countries. A key focus is to understand how combinations of food groups, including the role of fruits and vegetables, influence overall diet quality, disease risk, and the broader sustainability transition in European countries.

METHODS

The HEAT project integrates national dietary intake data, food composition data, multiple environmental indicators, monetary costs of food commodities and published dose-response meta-analyses into a multidimensional optimization framework. The model goes beyond focusing on individual nutrients and is instead based on food group disease relationships across twenty food groups and more than ten major NCDs that account for a substantial share of the current disease burden across European regions. Linear and nonlinear optimization techniques are used to construct dietary scenarios that reflect realistic dietary patterns while capturing trade-offs across multiple dimensions. Health impacts are quantified using comparative risk assessment, allowing identification of food group combinations associated with lower overall disease burden. Outcomes are expressed in disability adjusted life years (DALYs), enabling comparison of dietary scenarios across countries. Additional dimensions, including environmental indicators such as greenhouse gas emissions, water footprint, land use, and biodiversity, as well as monetary cost of foods and cultural feasibility, are incorporated to evaluate trade-offs and benefits across these domains and to identify realistic and sustainable dietary solutions for the selected European countries. Within this framework, the role of fruits and vegetables is evaluated in relation to human health, environmental performance, affordability and cultural acceptability in the European context.

RESULTS

Results are currently under development. Initial analyses focus on evaluating optimized dietary patterns first in Denmark, then across multiple European countries and assessing their potential to reduce disease burden while maintaining feasible dietary changes. Ongoing work aims to quantify how different dietary transitions, including shifts in fruit and vegetable intake, influence health outcomes and broader sustainability dimensions.

CONCLUSION

This work provides a multidimensional framework to identify dietary patterns that reduce disease burden while also accounting for environmental sustainability, economic feasibility, and cultural relevance. By integrating comparative risk assessment with optimization across several dimensions, the HEAT project aims to clarify the trade-offs and benefits involved in dietary transitions, including the role of fruits and vegetables within these transitions, and to support the identification of realistic and sustainable dietary solutions for European populations.

Challenging the meat–masculinity norm through the inherence heuristic: a field experiment in university restaurants

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Unpublished

Conflict of interest: This research was conducted within a CIFRE doctoral fellowship administered by the ANRT in partnership with Aprifel (a French non-profit association). The co-author affiliated exclusively with Aprifel contributed to facilitating institutional partnerships and reviewing the manuscript. Aprifel had no role in the study design, data analysis, or interpretation of the results.

OBJECTIVES

Social norms linking meat consumption to masculinity are widely documented and contribute to gender differences in food consumption, creating nutritional imbalances and acting as a barrier to dietary shifts toward more plant-rich diets. This study, developed in partnership with the French National Center for University and School Services (CNOUS) and the Regional Health Agency of the Paris region (ARS-IdF), examined whether a cognitive intervention targeting the inherence heuristic (or the tendency to explain associations by attributing them to internal rather than contextual causes, e.g. "Men just don't like vegetables" to explain why men eat more meat than women), could weaken the perceived association between meat and masculinity and influence food choices in university canteens.

METHODS

The intervention was implemented as a cluster randomized controlled field trial in eight university restaurants operated by the CNOUS in France. Participants were followed across two phases: baseline and intervention.
At baseline, participants completed a questionnaire assessing endorsement and justification of the meat–masculinity association (coded 0 = external explanations; 1 = inherent explanations), perceptions of meat as masculine, intentions to modify meat and vegetable consumption, and usual consumption outside university restaurants.
During the intervention, before choosing their food, participants read short essays presenting social, cultural, and historical explanations for the meat–masculinity association. Control participants read essays about an unrelated food association involving another social group (milk aversion and Asians).
During both phases, participants sent photographs of their meals, allowing assessment of actual food choices. Participants provided six behavioral observations in total (three baseline, three intervention), coded according to whether they selected a vegetarian main dish or starter.
After the intervention, participants completed the same questionnaire to assess changes in cognitive, attitudinal, motivational, and behavioral measures.

RESULTS

The intervention produced the intended cognitive effect. Among participants exposed to the meat–masculinity essays, the proportion of participants providing an inherent explanation decreased from approximately 20% at baseline to 5% after the intervention, with a stronger decrease than among participants who read unrelated texts, from 36% to 26%). However, unlike in our previous online study, this cognitive shift did not translate into robust changes in endorsement of the meat–masculinity norm, perceptions of meat as masculine, intentions to modify meat or vegetable consumption, or actual food choices in university restaurants.

CONCLUSION

Making the social, cultural, and historical origins of the meat–masculinity association visible can modify the cognitive processes through which this food norm is understood, even in a real-world eating environment. However, this was not sufficient on its own to change beliefs, motivations, or dietary behavior. These findings support combining cognitive interventions targeting social norms with broader approaches addressing other determinants of food choice.

Longitudinal dynamics of flexitarian diets in French households

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Conflicts of interest, please note that Eloïse Castagna and Mathilde Vandenberghe are employees of Bonduelle Group, which funded the research presented in this work

OBJECTIVES

Flexitarian diets are increasingly promoted to improve human and planetary health, yet little is known about how such diets evolve over time at the household level. This longitudinal study aimed to describe the dynamics of flexitarian transitions over one year and to identify factors associated with increases or decreases in vegetarian meal frequency.

METHODS

An observational longitudinal study followed 427 French flexitarian households over a 12-month period (2024–2025). Participants reported dietary habits, motivations, food representations and cooking practices at baseline and after one year. Dietary frequencies of vegetarian meals, animal products and plant-based foods were assessed, as well as perceived ease, pleasure and economic aspects of vegetarian meals.

RESULTS

At the group level, the mean frequency of vegetarian meals appeared stable over time. However, individual trajectories revealed heterogeneous dynamics: 21% of participants were frequent vegetarian-meal consumers at baseline and remained so; 42% significantly increased vegetarian-meal frequency, reaching on average five meals per week; 30% decreased their frequency; and 7% remained low consumers. Increased vegetarian-meal frequency was associated with greater cooking confidence, enjoyment of cooking and willingness to diversify meals. "Conversely, decreases were more common in households with children: 49% of these households included at least one child, compared with 36% among those reporting increasing consumption and 30% among regular vegetarian meal consumers. These households also showed higher price sensitivity and lower confidence in preparing meals that would be appreciated by all household members. Across the whole sample, consumption frequency and diversity of legumes and whole grains increased, while red meat and pork consumption significantly decreased. Poultry consumption declined moderately, egg consumption tend to increase, and approximately half of participants never consumed meat substitutes. When meat was excluded, partial compensations toward cheese, bread and desserts were observed in 20–40% of participants. Representations of vegetarian meals were largely positive and further improved over the year, particularly regarding digestibility, satiety, well being, ease of preparation and cost.

CONCLUSION

Flexitarian transitions are dynamic and heterogeneous, and average population indicators may mask meaningful individual changes. Motivations, household context and culinary self-efficacy appear to be key levers to sustain an increase in vegetarian meals. Supporting flexitarian households with accessible, appealing and nutritionally balanced plant-based solutions may facilitate long-term dietary transitions aligned with public health and sustainability goals.

Lived experiences of commercial children's foods: feeding relationalities, parental moralities and implications for fruit and vegetable consumption amongst UK children aged 1-9

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Conflict of interest statement: The author has no conflicts of interest to declare.
Unpublished

OBJECTIVES

This paper explores the relative desirability of fruit and vegetables (FV) compared to industrially manufactured alternatives for caregivers feeding young children, building on discussions at EGEA 2023 around the determinants of consumer behaviour and food choice. It draws on doctoral ethnographic research with families of children aged 1-9 in the city of Brighton and Hove (B&H), UK, which set out to explore lived experiences of commercial children's foods.

METHODOLOGY

Ethnographic research, involving extended participant observation and semi-structured interviews with 24 caregivers in a wide range of child feeding contexts (March 2021 – August 2022), was supported by a broader review of the UK child feeding landscape – including expert interviews, analysis of industry and social media, product observations and autoethnographic reflections. Primary data is joined with social theory on enchantment and the agency of 'things,' anthropological understandings of food within kinship and relatedness, and political economy perspectives from commercial determinants of health literatures – to provide a fresh perspective on the drivers of contemporary children's diets.

RESULTS

The findings advance understandings of the social influences on feeding choices by highlighting the meanings and implications of industrial foods within these dynamics. Children's food is bound up with the manifestation and management of parent-child relationships. Processed, packaged foods targeted at children were particularly potent and valuable "substance[s] of relatedness" (Carsten, 1997) for B&H caregivers, thanks to their "liveliness" (Bennett, 2010) and ability to captivate children, eliciting affective responses. Child feeding is meanwhile a key domain within 'good' parenting endeavours. While non-industrial feeding ideals co-exist, children's food products also enchanted B&H caregivers, positioned and widely received as enablers of successful contemporary parenting – as healthy feeding solutions that facilitate other dimensions of 'good' parenting, notably through their practical convenience. Brands directly situate their products as successful parenting "props" (T. Miller, 2013) within these dynamics through their nutrition claims, child feeding advice, and positioning as parent supporters. Consequently, despite having internalised public health guidelines around the importance of FV, B&H caregivers experienced limited agency in practice to feed their children FV and other non-industrial foods, particularly in out-of-home feeding settings.

CONCLUSION

The paper concludes by arguing for an urgent need to acknowledge how commercial children's food products are experienced within contemporary families as multi-dimensional, vibrant and alluring materialities, indeed with their own "thing-power" (Bennett, 2010) – and with direct consequences for the relative desirability and appeal of FV, and the agency caregivers have to feed their children these non-industrial foods in practice. Setting FV on a level playing field and facilitating genuine freedom for caregivers around children's food will require policy interventions to limit the abilities of children's food brands to enchant children and parents, as well as enhancing the value of FV within feeding relationalities and moralities.

Living Labs as a Methodological Framework for Optimising Mediterranean Diet Innovations

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OBJECTIVES

This study aimed to validate Mediterranean Diet (MD)–based recipes using a Living Lab methodology designed to integrate consumers directly into the evaluation and refinement of culinary innovations. Living Labs were implemented as user centred, real-life environments enabling co creation, experimentation, and iterative testing with adults aged 18–40 across four countries (Spain, Portugal, Italy, and Turkey). After an initial co-creation phase that generated a portfolio of recipes aligned with MD principles, the Living Lab sessions were developed to assess consumer acceptance, sensory perception, cultural relevance, and the feasibility of adapting these recipes into Ready to Eat formats.

METHODOLOGY

A harmonised protocol was applied across all countries, including ethical approval and informed consent. Sessions began with an introduction to the MoreMedDiet project and the Mediterranean Diet, followed by information on each recipe's origin, ingredients, preparation, sustainability, and sensoryattributes. Chefs prepared thirteen standardised recipes, which participants tasted in immersive, dining-style settings. Small portions were evaluated using an 11-item questionnaire on a 7-point scale assessing sensory qualities, perceived healthiness and sustainability, purchase intention, willingness to cook the dish, and economic viability. Each country held three sessions with groups of 12–13 young adults, enrolling a total of 107 participants. Data were analysed statistically to compare sensory and perceptual trends within and between countries.

RESULTS

Results demonstrated the value of the Living Lab approach in capturing cross-cultural variations, identifying sensory drivers of liking, and revealing how perceptions of sustainability, healthiness, and affordability influence acceptance. The process highlighted that consumer preferences extend beyond taste to include cultural familiarity, ingredient sustainability, and the practicality of incorporating these dishes into daily life. The Living Lab approach also facilitated rich qualitative feedback, allowing participants to discuss expectations, local adaptations, and recipe relevance within their own culinary traditions. This fostered rich culinary exchanges within the framework of the Mediterranean diet.

CONCLUSION

In conclusion, the Living Lab approach proved essential for aligning Mediterranean Diet innovations with real consumer habits and expectations, providing a robust framework for recipe optimisation and supporting the development of Ready-to-Eat meals that resonate across diverse cultural contexts. The approach demonstrated how collaborative, user-centred testing in authentic environments enhances the relevance, acceptability, and sustainability of new food products within modern dietary patterns.

Designing sustainable 5-a-day baskets: how fruits and vegetables selection impacts nutrition, environmental footprint and cost in France

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Unpublished

OBJECTIVES

The aim was to assess how different combinations of fruits and vegetables (F&V) used to meet the "5-a-day" recommendation affect nutritional quality, environmental impact and monetary cost.

METHODOLOGY

A food sustainability database (FSD) was built by connecting prices, portion size, environmental impacts and nutritional contents of 14 fruits and 11 vegetables selected based on data availability. Prices were collected in retail stores by the Réseau des Nouvelles des Marchés in 2022 and 2025. Nutritional and environmental data came from CIQUAL 2025 and Agribalyse 3.2 databases. A portion size "as consumed" was assigned to each F&V based on INCA3 survey' French adults consumption.

F&V were randomly selected from the FSD to compose 600 "5 F&V" baskets. These baskets were equally distributed across 6 types : "5 fruits", "4 fruits and 1 vegetable", "3 fruits and 2 vegetables", "2 fruits and 3 vegetables", "1 fruit and 4 vegetables" and "5 vegetables". Median cost, environmental impacts and nutritional contents (expressed in percentage of Dietary References Intake (DRI)) were estimated and compared between basket types. Costs of baskets were compared between 2022 and 2025.

RESULTS

The 600 baskets contained 483 g of edible F&V providing 189kcal (ie 9.5% of 2000kcal). They covered 74% of DRI for vitamin C, 34% for selenium, 29% for fibers, 27% for potassium, 21% for vitamin B1 and between 15 and 20% of vitamin B6, phosphorus, iron, copper and magnesium DRI.

Increasing the share of fruits in baskets was associated with higher weight (on average +42g per additional fruit portion), energy (+45kcal), fiber (+15%), vitamin C (+29%), selenium (+36%), potassium (+7%), magnesium (+7%) and copper (+3%) but lower vitamins B1 (-18%), B6 (-11%) as well as iron (-16%) contents. Baskets without fruits provided 37% of Vitamin C DRI and those without vegetables only 9% of iron DRI. Global environmental score PEF (+9.1%), especially water resource and land use (+57% and +77% respectively) as well as cost (+11%) increased with additional fruit portion.

Applying 2025 prices led to a 4.5% increase in basket cost compared with 2022 (from 2.64€ to 2.77€) mainly due to rising fruit prices.

CONCLUSION

F&V are essentials to cover human needs. Due to their nutritional, environmental and economic specificities, fruits and vegetables needs to complement each other to optimize their sustainability potential.

Fruit and vegetable amount in nutritionally adequate and environmentally constrained diets: insights from individual-level diet modelling in France

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Unpublished

OBJECTIVES

Fruits and vegetables (F&V) are key components of healthy and sustainable diets, yet their roles within dietary transitions remain complex. This study aims to assess how F&V quantities evolve when individual diets are optimised to meet nutritional adequacy under environmental constraints.

METHODOLOGY

Dietary data were drawn from the French nationally representative dietary survey INCA3 (n=1,718 adults), combined with food composition data from the CIQUAL database and environmental impact indicators from Agribalyse 3.2. An individual-level linear optimisation model was applied to generate, for each individual, an optimised diet that satisfies nutritional adequacy while remaining as close as possible to observed consumption patterns. Nutritional constraints ensured compliance with the most recent French recommendations for protein, lipids, carbohydrates, fiber, vitamins, and minerals for each individual diet. Environmental constraints were introduced at population level. Diets were optimised to achieve a 30% reduction of total greenhouse gas emissions relative to observed diets, while preventing any increase in other environmental indicators, particularly freshwater use. Indeed, increasing F&V without environmental safeguards is often associated with higher freshwater use. Mean F&V amounts were compared between observed and optimized diets, both globally and by F&V category (10 fruit and 9 vegetable categories). Amounts were expressed in grams per day and in number of portions (ie 80 g). The distribution of F&V amount was then analyzed in relation to the French recommendation of 'at least five F&V per day,' with intakes below 2.5 portions/day considered low.

RESULTS

Average amount in observed diets was 4.3 portions/day (2.4 vegetable portions and 1.9 fruit portions) and reached 7 portions/day in optimised diets, reflecting increases in vegetables (4 portions/day) and fruits (3.4 portions/day). Adherence to the "5-a-day" recommendation improved markedly. In observed diets, 29% of individuals consumed fewer than 2.5 portions/day, 37% consumed between 2.5 and 5 portions/day, and 35% exceeded 5 portions/day. After optimisation, fewer than 1% of individuals had a F&V intake below 2.5 portions/day, while 89% exceeded 5 portions/day. Overall, 94% of individuals showed an increase in F&V intake compared with observed diets. Among vegetables, the largest increases were observed for fruiting vegetables—particularly green beans (+54 g/day)—as well as mixed vegetables. Mushrooms marginally decreased, likely reflecting their comparatively higher freshwater use. Among fruits, the most pronounced increases concerned exotic fruits, notably kiwi (+55 g/day) and banana (+19 g/day), followed by citrus fruits(+25 g/day), and pome fruits such as pears (+25 g/day).

CONCLUSION

A substantial increase of fruits and vegetables is necessary to meet nutritional adequacy under environmental constraints. Although the model selectively favors specific F&V categories—due to food preferences, nutritional, or environmental profiles—all F&V categories are represented in the optimised diets. This highlights the importance of maintaining a diversity across F&V when designing sustainable dietary transitions.

The importance of small-scale farming in a sustainable dietary transition

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Unpublished

Competing Interest Statement: The authors declare no competing interests.

OBJECTIVES

Dietary change is crucial to achieving sustainable food systems, with frameworks such as EAT-Lancet calling for reductions in animal-sourced foods and broader adoption of plant-rich diets. How such transitions will affect different types of farmers, however, remains largely unexamined. Small-scale farms (<5 ha) produce about half the world's food and dominate the supply of plant foods like fruits, vegetables, legumes, and nuts, yet how demand-side change reshapes their roles is unclear. This study examines how dietary transitions alter the distribution of production across farm-size classes, which crop groups and regions are most sensitive, and how trade networks restructure under alternative dietary pathways.

METHODOLOGY

We employ a spatial price equilibrium model projecting bilateral trade flows, production, and consumption for 32 crops across 153 countries from 2020 to 2050. It solves for equilibrium prices, quantities, and bilateral trade under five scenarios: a business-as-usual benchmark and four alternative plant-rich pathways (flexitarian, pescatarian, vegetarian, vegan). We integrate spatially explicit farm-size data to allocate production to small (<5 ha), medium (5–50 ha), and large (>50 ha) farms by country. To test sensitivity to structural changes in farming, we apply country-specific trajectories of farm consolidation and fragmentation.

RESULTS

Dietary transitions alter aggregate production volumes more than their farm-size distribution, which remains broadly stable. However, these aggregate patterns mask substantial crop-specific and regional variation. Demand for fruits, vegetables, legumes, and nuts expands under alternative diets, falling largely on small-scale farmers in East Asia Pacific, South Asia, and Sub-Saharan Africa, while reduced feed demand contracts large-scale soybean production in North America and Latin America. Crop-specific farm-size composition shifts: the small-farm share of fruit and vegetable production falls from 74% in 2020 to 69-71% in 2050 as large farms absorb part of the growth, while the soybean small-farm share rises from 7% to 12-18%. Dietary transitions also reshape trade: the large-farm share of global trade volumes declines from 60% in 2020 to 44-49% by 2050, while small-farm share rises from 29% to 32-37%, redirecting which farmers supply globally consumed food. These patterns are robust to alternative assumptions about farm-size consolidation and fragmentation.

CONCLUSION

Dietary transitions are typically evaluated against aggregate production and environmental targets, obscuring distributional consequences across farm-size classes. Our results show that dietary pathway shapes not only how much is produced and traded, but also which farmers produce, export, and absorb adjustment pressures. A plant-rich dietary transition will rely heavily on production from countries and sectors dominated by small-scale farming, yet agri-food support favours resource-intensive food sectors such as livestock and dairy. Our findings argue for realigning finance and policy to strengthen smallholder capacity where demand grows, and to manage structural adjustment where production and trade are most pathway-dependent, to enable a just dietary transition.

Designing climate-friendly and nutritionally adequate diets for Belgian adults: implications for food-based policy

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Unpublished

Conflict of Interest: The authors declare no conflicts of interest.

OBJECTIVES

Dietary change is a key lever for reducing greenhouse gas emissions (GHGE), yet policy-relevant strategies must simultaneously ensure nutritional adequacy, affordability, and cultural feasibility. This study aimed to identify optimized diets for Belgian adults across multiple dietary patterns and to derive actionable insights for sustainable dietary guidelines, with particular attention to fruit and vegetable consumption.

METHODOLOGY

A dataset of 416 foods aggregated into 112 FoodEx2 food groups was constructed using Belgian consumption data, nutrient composition, prices, and life cycle–based GHGE values. Linear programming was used to minimize deviation from current diets while satisfying dietary reference values (DRVs), Belgian food-based dietary guidelines (FBDGs), and, where applied, a GHGE constraint of 1663 g CO_2eq/day aligned with EAT-Lancet 2.0 targets. Models were developed for females and males across omnivorous, pescatarian, vegetarian, and vegan dietary patterns.

RESULTS

Nutritionally adequate and climate-constrained diets were feasible across all dietary patterns. Compared with baseline diets, optimized omnivorous diets reduced GHGE by up to 58% in females and 70% in males when a climate constraint was applied. Across all scenarios, increased consumption of vegetables, fruits, legumes, and whole grains emerged as a consistent and necessary feature of optimized diets. Vegetable intake, particularly leafy and bulb vegetables, rose substantially, while whole-fruit intake increased alongside reductions in fruit juices and processed products. These shifts were essential both for meeting nutritional requirements (e.g., fibre, potassium, vitamin C) and for lowering GHGE. However, alignment with DRVs and FBDGs alone did not achieve climate targets, and shifts toward vegetarian or vegan diets were not sufficient in all cases, particularly among males. A limited set of nutrients, including free sugars, sodium, saturated fat, iodine, iron, vitamin B12, calcium, and ω-3 fatty acids, governed feasible solutions.

CONCLUSION

Substantial reductions in diet-related GHGE in Belgium can be achieved through realistic dietary changes without requiring fully plant-based diets. Policies promoting higher intakes of vegetables and fruits, alongside reductions in discretionary foods and high-emission animal products, represent a robust strategy to jointly address health and climate goals. However, current dietary guidelines are insufficient to meet climate targets without explicit environmental considerations. These findings provide a quantitative basis for integrating sustainability into national dietary recommendations and public health policy.

Dietary patterns in Réunion island: understanding sustainable diets in a French overseas region

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Unpublished

The authors report no conflicts of interest.

OBJECTIVES

The nutrition transition is a global phenomenon marked by profound shifts in dietary and physical activity patterns with subsequent changes in the prevalence of obesity, diabetes, and hypertension. In Réunion Island, a French overseas region, the increasing prevalence of these diseases exceeds that observed in mainland France. Yet, very few studies have examined the nutrition transition on the island. Understanding dietary patterns is essential in this context of concurrent urban, demographic, and climate transitions that may further shape nutrition, health, and food system sustainability. This study therefore aims to identify the dietary patterns coexisting among adults in Réunion Island as a first step toward assessing their drivers, health outcomes, and environmental impacts, and ultimately informing pathways toward more sustainable diets.

METHODOLOGY

A cross-sectional study was conducted in 2025 on 2110 adults (≥16 years) living in Réunion Island using quota sampling based on sex, age, education, occupation, and place of residence to ensure sociodemographic and spatial representativeness. Dietary intake was assessed with a semi-quantitative Food Frequency Questionnaire developed and validated specifically for the Reunionese context, including 185 foods and beverages reflecting local dietary traditions. Food group intakes were categorised into tertiles of low, medium, and high consumption levels, with an additional category for non-consumers. Preliminary dietary patterns were identified using latent class analysis, with models ranging from 1 to 9 classes estimated without covariates and selected based on model fit indices, class sizes and interpretability.

RESULTS

Five dietary patterns were identified in the preliminary analysis, representing 20%, 19%, 25%, 23% and 14% of the sample, respectively. The healthy pattern showed high consumption of fruits, vegetables, legumes, whole grains, and eggs, and low intake of red and processed meat and sweetened beverages. The traditional pattern was characterized by high consumption of rice, legumes and Reunionese traditional dishes, with limited consumption of sweetened beverages and processed meat. A transitioning pattern combined high consumption of rice and traditional foods and vegetables alongside elevated intake of fast foods and sweetened beverages. The convenient pattern was marked by high probabilities of consuming fast foods, fried preparations, and sugary products, alongside particularly low fruit and vegetable intake. Finally, a low intake pattern reflected uniformly low consumption across all food groups.

CONCLUSION

The coexistence of multiple dietary patterns in Réunion suggests different stages of dietary changes as described by Popkin et al. (2006), highlighting the heterogeneous and ongoing nature of the nutrition transition. Ongoing analyses to be presented at the EGEA conference will characterise these patterns by nutritional quality, sociodemographic determinants, food supply practices, and reported health outcomes, with the aim of identifying levers to shift diets toward healthier and more sustainable food systems.

Mapping and Analyzing Fruit and Vegetable Flows at the Montpellier Marché d'Intérêt National

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Unpublished

Conflict of Interest Statement: Funded by the TerrAsol project - Territoires Agricoles et Alimentaires Solidaires (France 2030 program). The authors declare no conflict of interest.

OBJECTIVES

This study focuses on the Montpellier Marché d'Intérêt National (MIN), a strategic logistics and commercial platform located at the core of urban food flows. Acting as an intermediary between producers, wholesalers, and buyers (Sirjean, 2015), it provides a relevant case for analyzing the organization of flows and the dynamics of agri-food value chains (Reardon, 2015). The objective is to assess the extent to which the MIN can contribute to the transition toward more sustainable and resilient

fruit and vegetable (F&V) chains. It aims to analyze food flows (origins, volumes, destinations), examine coordination mechanisms between actors, explore actors' perceptions of "local," "short supply chains," and "quality labels," and identify both structural constraints and potential levers for transition.

METHODOLOGY

The study adopts a mixed-methods approach combining qualitative and quantitative data within a single case study framework. It integrates supply chain analysis, value chain analysis, and a territorial perspective. The research is currently ongoing, with data collection conducted from April to July 2026 and analysis from August to September 2026. Data are collected through five semi-structured interviews, field observations, thirty questionnaires, and secondary sources, and are analyzed using multivariate methods. Particular attention is given to the role of intermediate actors and to the coexistence of short and long F&V chains as a factor of resilience.

RESULTS

Expected results will provide a detailed characterization of flow organization within the market, highlight coordination mechanisms between stakeholders, and identify key constraints and levers influencing the transition toward more sustainable F&V chains. They will also clarify the structuring role of intermediate actors in territorial food systems. Anchored in the concept of the "hidden middle" (Reardon, 2015), this research highlights the transformation of the MIN from its initial role of linking sellers and buyers to midstream functions related to value addition, logistics, temporal regulation (e.g., cold storage), food processing, and market organization and procurement.

CONCLUSION

Contemporary food systems have undergone significant transformations, driven by urbanization and evolving consumption patterns, leading to increasingly complex value chains with interconnected actors. Intermediate segments such as logistics, storage, and wholesale now play a central role in value creation and supply chain performance. At the same time, these systems face multiple vulnerabilities related to climatic, economic, and geopolitical crises, highlighting the importance of resilience, defined as the capacity to adapt, absorb shocks, and maintain essential functions.

This research contributes both to scientific knowledge and to practical action by providing insights and recommendations to support the evolution of the MIN and local food systems. It aims to improve understanding of ongoing transformations and to identify pathways toward more sustainable, resilient, and territorialized food systems.

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Leveraging Agrobiodiversity and Food Systems Approaches to Meet Fruit and Vegetable Recommendations in Latin America and the Caribbean

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INTRODUCTION

Fruits and vegetables (F&V) are foundational to healthy diets, with global recommendations calling for a minimum of 400 g per person per day to prevent non-communicable diseases and support overall wellbeing across the life course (FAO, 2020). Yet across Latin America and the Caribbean (LAC), actual consumption falls dramatically short of this threshold. Vegetable intake ranges from just 33 g/capita/day in Honduras to approximately 207 g/day in Mexico, well below the recommended 270 g/day for vegetables alone. Similarly, for fruits, reported consumption ranges from 27 g/day in Venezuela to 228 g/day in Peru (LAC Landscape Report, 2025; Global Dietary Database, 2018).

OBJECTIVES

This paper examines the food system, food environment, and cultural factors underlying the gap between F&V availability and consumption in LAC, and proposes a demand-driven, biodiversity-centered approach to closing this gap while staying within planetary boundaries.

METHODS

We draw on a structured review of regional dietary data, FAO food balance sheets, published papers, regional food systems expertise, and analysis of agricultural trade, institutional procurement, and a preliminary review of national germplasm collections and spatial distributions of F&V crop diversity across the region.

RESULTS

This gap is not primarily a production problem. LAC is one of the world's largest exporters of F&V, with an estimated regional availability of approximately 457 g/capita/year. Production is sufficient yet fails to translate into adequate consumption for millions of people. Valentino et al. (2025) found that the prevalence of daily F&V consumption is only around 56% among adults. Adequate consumption of F/V is mediated by many factors, including women's empowerment, socioeconomic conditions, and climate zone. The LAC region thus faces a striking paradox: it exports nutritious commodities that reduce diet-related mortality in importing nations (Springmann et al., 2023), while its own populations remain unable to access or afford the recommended daily amounts. Export incentives, supermarket retail standards that exclude smallholders, gender inequalities, and the erosion of traditional food cultures collectively drive this disconnect. Countries with larger Indigenous populations show above-average vegetable consumption, and preliminary mapping of national germplasm collections reveals concentrations of underutilized F&V diversity in areas where dietary gaps are most acute, suggesting untapped potential to connect locally adapted crop diversity to domestic food systems.

CONCLUSION

Closing the F&V consumption gap in LAC requires reorienting food systems around domestic nutritional needs while balancing export competitiveness alone. Demand-driven approaches, including agrobiodivesity-centered dietary guidelines, institutional procurement linked to local and traditional produce, school-based programs connecting youth to crop diversity, and targeted germplasm-collection missions, stable funding for the conservation of national or regional germplasm collections and stronger linkages between collections and food system actors, offer pathways that simultaneously improve diets, support smallholder livelihoods, and conserve the region's extraordinary biological heritage within planetary boundaries.

Traditional Andean diet: Levers for resurgence and contributions to food quality and health among female smallholders' farmers in two provinces of the Ecuadorian Highlands

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OBJECTIVES

Agricultural intensification and food industrialization over recent decades have profoundly transformed dietary habits in Ecuador[1]. The Traditional Andean Diet (TAD), characterized by high nutritional density and biodiversity, has been increasingly displaced by introduced, energy-dense, and ultra-processed foods[2]. This transition has contributed to the country's triple burden of malnutrition[3]. As part of the Ekomer-Redes project, this study aimed to: (1) identify factors associated with the practice of TAD; and (2) evaluate the relationship between TAD practice and dietary quality among participants.

METHODOLOGY

The study was conducted with the participation of 1,057 female smallholder farmers in the provinces of Azuay and Pichincha. TAD practice was assessed through indicators measuring the knowledge and consumption of a diverse selection of 12 typical regional traditional foods (TFs). Data collection included socio-demographic and socio-economic questionnaires, a food frequency questionnaire (FFQ), and 24-hour dietary recalls. Multiple linear regression models were used to identify factors associated with TF consumption and to examine the associations between TAD practice and dietary quality indicators. Participation in Alternative Food Networks (AFNs) community-based food systems that promote agroecological production, short supply chains, and local food sovereignty was included as a key explanatory variable.

RESULTS

Participation in AFNs, advanced knowledge of TF, Indigenous ethnicity, and older age (≥30 years) were all positively associated with higher consumption of TFs. In turn, greater TF consumption was significantly associated with improved dietary quality, including higher dietary diversity scores and a lower proportion of caloric intake derived from ultra-processed foods. These findings suggest that cultural identity and participation in organized AFNs may act as protective factors against the ongoing nutritional transition.

CONCLUSION

The associations observed in this farming population are consistent with broader concerns regarding declining dietary diversity and increasing ultra-processed food consumption in Ecuador. While further research is needed to assess transferability to the general population, the results suggest that strengthening AFNs and supporting the transmission of TF knowledge could represent scalable strategies for promoting healthier and more sustainable diets. Public policies should actively support female smallholder farmers and value their complex journey and essential initiatives by integrating, fostering, and upscaling agroecological markets, community food initiatives, and culturally grounded nutrition education. This approach will help reactivate the social and cultural drivers that sustain traditional food systems while preserving local biodiversity.

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Carbon-costed diets require redistribution to ensure equitable access to sustainable diets

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Unpublished

OBJECTIVES

Food-system greenhouse gas emissions (GHGE) impose large social costs that are rarely reflected in food prices. Yet the affordability impacts of internalising these costs remain unclear across populations and regions.

METHODOLOGY

Here, we integrate dietary intake, country-specific carbon footprints, food prices, and income distributions with MATILDA (Micro–Macro Assessment Tool to Identify Low-impact Dietary Actions) to estimate market and carbon-inclusive dietary costs across 165 countries and socio-demographic groups. We examine how internalising the social cost of diet-related GHGE alters dietary affordability globally and regionally.

RESULTS

Internalising the social cost of diet-related GHGE raises dietary costs by 8-32% across regions, rendering an additional 397 million people worldwide unable to afford current diets. Low-income populations in sub-Saharan Africa and Southern Asia are particularly affected, while full-pricing of diets in high-income regions has minimal impact on affordability.

CONCLUSION

These findings underscore the importance of coupling dietary transitions with redistributive and environmental pricing policies to ensure that food system decarbonisation does not exacerbate global nutrition inequities.

The consumer perceptions regarding the shifts in food prices and the potential changes in diets?

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The authors declare no conflict of interest.

OBJECTIVES

The necessary transitions towards sustainable diets are impeded by many factors, including the numerous economic constraints. This study examines the consumer perceptions regarding the shift in food prices and the potential changes in diets, with a specific focus on fruit and vegetable consumption.

METHODOLOGY

An online survey was conducted in 2025 among 3,225 residents in Île-de-France (Paris area) to examine how economic constraints influence food choices. Based on these data, a hierarchical agglomerative clustering (HAC) method relying on several indicators of economic constraints was used to identify distinct consumer profiles.

RESULTS

The results reveal the importance of food-related constraints in a post-COVID inflationary context. Indeed, 55% of respondents reported modifying their food consumption for cost-related reasons, and one quarter were not always able to purchase all the foods they wished due to budget limitations. Moreover, the clustering analysis identifies four contrasting profiles. Cluster 1 (with 1,276 respondents) is characterized by satisfying levels of food consumption, and the lowest perception of inflation. Without reporting major difficulties, cluster 2 (with 1,047 respondents) is nonetheless among the most affected by rising prices: nearly 90% have modified their dietary habits, notably resulting in a perceived decline in the quality of their food basket. Cluster 3 (with 772 respondents) corresponds to households facing strong economic constraints without recourse to food assistance, and reporting some of the lowest levels of regular consumption of meat, fish, fruits, and vegetables, as well as the highest perception of inflation. Finally, cluster 4 (130 respondents) groups households reporting reliance on food assistance. These economic differences entail some consequences regarding the possible improvements in diets captured by questions about fruit and vegetable consumption. The knowledge of the benefits of consuming more fruits and vegetables appears relatively similar across the four clusters, which contrasts with the burden of economic constraints. In clusters 3 and 4, the strong feeling of under-consumption is accompanied, in each of these two groups, by the fact that more than 50% of individuals consider increasing fruit and vegetable consumption to be very important. However, around 70% of individuals in cluster 3 and 60% in cluster 4 perceive this increase as difficult, compared with around 40% in cluster 1, and 50% in cluster 2. This perceived difficulty is partly related to the anticipated monetary cost of a diet richer in fruits and vegetables. A subgroup within cluster 4 notes that the difficulty is mitigated by food assistance and collective catering.

CONCLUSION

Overall, these results highlight both strengths and limits of targeting approaches based solely on recourse to food assistance. They argue for more graduated public policies able to (1) better identify and support "in-between" populations facing significant but less visible constraints, and (2) directly address affordability through targeted subsidies for fruits and vegetables.

Local fruits and vegetables production perception in consumer-producer dialogues: understanding information gathering and trust mechanisms in Guadeloupe

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Unpublished

OBJECTIVES

Guadeloupe, a French overseas territory, is facing increasing challenges regarding its food provisioning, along with a raising rate of diet-related diseases. More than 80% of the consumed food is imported, and its agri-food system is still deeply influenced by the legacy of the plantation economy system. Today, scientists, actors of civil society and local politics advocate for more local food, responsibly grown and produced, but these changes involve many challenges. One of the main concerned food group is fruits and vegetables, for both agricultural and nutritional reasons. Our objective is to analyze more specifically the perception of Guadeloupean consumers regarding existing labeling processes and quality guarantees, and the potential role of those processes in promoting local fruits and vegetables consumption and general food knowledge.

METHODOLOGY

To better understand these issues, we conducted a qualitative and quantitative survey among consumers, through questionnaires (n=170) and semi-structured interviews (n=30). In the questionnaire we asked about the knowledge of labels and their impact in purchase decisions, as well as the level of trust of different types of purchasing places. In interviews, we investigated individual food provisioning strategies (in particular for fruits and vegetables) and general perceptions of the interviewees on the food system (main criteria for purchase, availability, affordability, etc.) We also interviewed farmers to understand their practices and how they share them with their consumers.

RESULTS

Inhabitants are indeed faced with a hurdle: most of existing labels in the food market come from mainland France, are little known and even less trusted. But new labels are recently emerging locally. We studied the main obstacles to the consumption of fruits and vegetables, especially local ones. We analyzed how labels and other trusts mechanisms are perceived. Hence, we show that price is one of the main declared obstacle to fruits and vegetable purchase, and labelling are often perceived as a way to increase price rather than offering a strong guaranty on quality. On the contrary, trust mechanisms based on interpersonal interactions seem to be particularly important for consumers (knowing the farmer or the merchant/the place), who value local production and wish for its development.

CONCLUSION

This study aims to analyze the challenges of local fruits and vegetables production from the perspective of trust and trust mechanisms, and to see whether and how local agri-food knowledge can be transmitted through different mechanisms and promote both fruits and vegetables consumption and local agriculture development.

Effectiveness of an experiential on-site education intervention on food safety knowledge, attitude and practices among street food vendors in Nairobi's informal settlements

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OBJECTIVES

The study aimed to assess the effectiveness of a context-specific education and support supervision intervention on the food safety knowledge, attitudes, and practices among street food vendors in informal settlements in Nairobi.

METHODOLOGY

This study developed a context-specific education and support supervision intervention to improve food safety knowledge, attitudes and practices among street food vendors in two informal settlements (Korogocho and Viwandani), in Nairobi, Kenya. Food vendors in the intervention area received food safety training and support supervision from public health officers over a period of 4 months. We used a quasi-experimental controlled pre-post design to assess 181 (intervention = 100; control = 81) street food vendors (SFVs) with a checklist and a questionnaire. Based on observed imbalances in baseline outcomes, we used propensity score matching (PSM) to create a valid matched control arm based on relevant baseline covariates. The intervention's impact was subsequently estimated by applying difference-in-differences (DiD) framework within a linear regression model with fixed effects to the matched sample.

RESULTS

The average age of the vendors was 41.7 years; most were female (85.6%), married (64.1%), had completed primary education (59.1%), and had been vending for over four years. Using PSM, 108 vendors (54 in each arm) were successfully matched. Compared to the control arm, the intervention arm showed significant improvements in attitudes ($\beta = 0.41$, 95% CI = 0.01-0.80, P = 0.044) and practices ($\beta = 2.67$ 95% CI = 1.89-3.45, P <0.001), but no significant change in knowledge.

CONCLUSION

Despite possessing foundational food safety knowledge, street food vendors may not translate this understanding into positive attitudes or safe practices. This intervention effectively improved both vendors' attitudes and their practices in food handling and safety. This implies that the training and support supervision enabled the food vendors to apply their existing knowledge and additional knowledge to do things differently. Scaling up this intervention in similar settings is recommended to enhance food safety and to protect public health.



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