WPHNA 2014

Poster presentations

Organised by session (correct as at 3rd September 2014)
This study aimed to explore the potential mortality reduction associated with future policies for substantially reducing UPP intake in the UK.

We obtained data from the UK Living Cost and Food Survey. All food items were categorized into Group 1 (Healthy) that describes unprocessed/ minimally processed foods, Group 2 (Ingredients) that comprises processed culinary ingredients and Group 3 (UPPs) that contains ready-to-consume processed or ultra-processed products. It was estimated the energy and nutrient profile of each group. The change in nutrient profile resulting from hypothetical shifts from Group 3 to Group 1 foods and Group 3 to Group 1+2 foods was then translated into reductions in cardiovascular mortality using the IMPACT Food Policy model. A probabilistic sensitivity analysis was conducted.

An ideal scenario in which intake of salt, saturated fat and trans-fat in Group 3 (UPPs) is reduced to the levels observed in Group 1 (Healthy) would lead to 23,335 fewer CVD deaths (min 11,367, max 36,139) in 2030. This represents a mortality reduction of approximately 13%. This would comprise 15,046 fewer CHD deaths (min 7,108, max 23,602), and 8,288 fewer stroke deaths (min 4,260, max 12,536). In a feasible scenario, 14,353 (min 6,688, max 22,676) fewer CHD deaths and 7,874 (min 4,038, max 11,974) fewer stroke deaths are predicted.

The potential for reducing the burden of CVD through a healthier food system and healthier dietary patterns is massive. Although the complete elimination of UPPs is unlikely, even halving UPP consumption would still generate enormous public health benefits.
Prevalence of overweight, obesity, anemia and their associations with dietary habits, physical activity and body composition among female students at Zayed University- UAE

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Background: Both overall and abdominal obesity are associated with non-communicable chronic diseases such as type 2 diabetes, cardiovascular and cere It is important to note that there is a nutritional transition in food choices during the past years from the typical Mediterranean diet into the western fast food pattern. Therefore, obesity is responsible for a large proportion of the total burden of disease, such as heart disease, diabetes and cancers. Several international and regional studies indicated that factors causing obesity are multi-factorial.

In the Arab countries, some studies are available (Jordan, Kuwait, Saudi Arabia and Lebanon) regarding the determinants of obesity particularly among university students. These studies plus others from developed countries, draw an alarming picture of prevalent obesity, which in turn could be an indicator for an increase in the occurrence of other chronic diseases in the region, and found that factors associated with obesity were age, sex, education, marital status, smoking, physical activity, parental obesity, dietary habits and socio-cultural factors.

Main Objective: To assess the prevalence of overweight and obesity and their associations with the eating habits, physical activity, body body composition, and anemia among female students at Zayed University-UAE.

Methodology: A cross-sectional study conducted on a sample of 350 female Students. All subjects chosen randomly. Participants administered a self-reported questionnaire. The questionnaire consisted of questions regarding eating habits and physical activity. Weight, Height and Waist circumference. Hemoglobin level was measured by using Hemocue analyzer. body composition was measured by TANITA machin (fat, water, .etc). .

Results: We are still working on the results and at the time of the conference all results will be ready for presentation.
Consumption of ready-to-consume products and its association with diet quality in Colombian adults.

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High consumption of ready-to-consume products, either processed or ultra-processed, has been associated with overweight, obesity and poor diet quality. We aimed to document the association between consumption of ready-to-consume products (processed and ultra-processed) and diet quality in Colombian adults. Using data from the Colombian National Nutrition Survey (2005), we estimated food consumption based on 24-hour dietary records from 11,894 men and women between the ages of 18 and 64 years. Foods were classified into subgroups and groups according to the system developed by Monteiro et al. (2012), based on the nature, extent and purpose of food processing. For the analysis, three final groups were created: food based culinary preparations (unprocessed and minimally processed foods plus processed culinary ingredients), processed, and ultra-processed products. We estimated the contribution of each group to total energy, energy density (only solids), as well as protein, carbohydrates, total fat and saturated fat within each group. Contribution from food based culinary preparations to total energy was 68.2%, and from processed (6.9) and ultra-processed products (24.1) was 31.8%. Overall, food based culinary preparations had better diet quality (protein 15%, carbohydrates 69.6%, total fat 15.2%, saturated fat 5.8%, fiber 9g/1000kcal) and lower energy density (1.33kcal/g) compared to ultra-processed products (protein 6.4%, carbohydrates 42.7%, total fat 50.7%, saturated fat 13.8%, fiber 1.6g/1000kcal, and energy density 3.4kcal/g). Given the rising rates of overweight and obesity in the country is important to incentivize consumption and production of unprocessed and minimally processed food, and to protect and promote cultural traditions associated with culinary preparations.

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Background: Empirical analyses of how rising food prices since 2008 have impacted mortality in low/middle income countries has been sparse, focussing on national or large regional trends, ignoring more micro-level trends that are likely tied to localized food prices.

Methods: We linked mortality and sociodemographic data from wave 3 (2007-2008) of India’s nationally representative District Level Household Survey (DLHS) with food price data from the National Sample Survey to create maps of district-level patterns in mortality and food prices. We then applied fixed effects regression models to test this relationship controlling for % of households with a below poverty (BPL) card, average household wealth index in the district, women’s empowerment, and district sociodemographics. Models were estimated separately for NNMR, IMR, and CMR, and interactions were tested between food prices and poverty measures.

Results: We find substantial geographic variation in mortality, with NNMR, IMR, and CMR being lowest in South India and highest in the central northern region. Interactions were found for average wealth and wheat (NNMR, IMR, and CMR) and for BPL card and rice (NNMR only). While wheat and rice prices were positively associated with mortality in high poverty districts, this relationship ranged from non-significant to inverse for low poverty districts.

Conclusions: Rising food prices are positively associated with NNMR, IMR, and CMR. Additional research is needed to understand how social policy and household coping strategies may exacerbate or mitigate the effect of food prices on mortality.
Dietary patterns in university students: a sustainable and healthy pattern is prominent.

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University students are reported to tend towards diets low in fruits and vegetables and high in alcohol, confectionery and convenience foods. However, dietary intake among this group has not been investigated using a dietary patterns approach. The aim of this study was to identify dietary patterns among Home and EU students at the University of Sheffield, UK.

All eligible students were invited to complete a web-based, validated Food Frequency Questionnaire (123 items) (DIETQ, Tinuviel Software Ltd., UK) during Autumn Semester 2013. Dietary patterns were generated using principal component analysis (PCA).

Data from 575 students (73% female; 79% White British; 30% first years; 24% postgraduates) were entered into the PCA, which revealed eight distinct dietary patterns. These patterns were identified as (numbers in parentheses indicate the percentage of variance in food intake explained by each pattern): prudent/healthy (7.7%); vegetarian (5.3%); convenience (4.4%); booze, meat & fried food (3.9%); cheap & easy cooking (3.4%); tea/coffee & margarine (3.1%); eggs & dairy (2.9%); and limited, healthy (2.9%).

This study revealed heterogeneity in eating habits among a university student sample. Some patterns (e.g. convenience; booze, meat & fried food) concur with existing literature and are indicative of less healthful and sustainable eating patterns. However, a prudent/healthy pattern, orientated towards consumption of fruits, vegetables, oat/bran-based cereals, nuts and fish was most prominent. Further work will address the sociocultural factors underpinning this pattern.
Macronutrient manipulation for weight loss and cardiovascular health: A critical summary of existing systematic reviews

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BACKGROUND

Dietary macronutrient manipulation for weight loss and cardiovascular healthy remains controversial, exposing the public to mixed messages. We aimed to examine existing synthesised evidence on this question by critically summarising content and methodological components to inform the need for, and methods of a new systematic review.

METHODS

Drawing on Cochrane Overview of Systematic Reviews methods, we sought existing systematic reviews on macronutrient manipulation for weight and cardiovascular risk that included human experimental or observational studies by searching The Cochrane Library and Medline (last search 3 March 2014). Data was extracted and tabulated to summarise the scope of questions addressed, including types and description of participants, number and types of studies, pre-specified treatment/exposure and comparator, and outcomes. Methodological quality was determined using AMSTAR.

RESULTS

We included 50 reviews after screening 892 records and identified a number of constraints related to interpreting the evidence. Main constraints were that treatment/exposure and control diets were incompletely defined or not at all, and total energy intake was not considered in many comparisons where weight was an outcome. Definitions of commonly used dietary terms such as “healthy”, “low-fat” or “usual” were inconsistent. Constraints resulted in potentially unclear comparisons, confounding and methodological heterogeneity.

CONCLUSIONS

To more definitively inform this question, a systematic review is needed that explicitly considers the effect of total energy intake on weight, with clearly defined treatment and control diets in relation to macronutrient profiles. This critical scoping of existing evidence highlighted the lack of consistency in definitions of different diets, including a healthy diet, in relation to macronutrient composition.
Local food systems, consumption patterns and nutritional outcomes - Implications for sustainable diets in rural South Africa

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In South Africa, household food insecurity co-exists with rising levels of obesity, reflecting poverty but also poor dietary habits. This research explores the linkage between local food systems (radius <50km), consumption patterns and nutritional status of rural resource-poor households.

In 2013, six focus group discussions in two communities and 20 interviews with food chain actors were carried out. Food security, dietary diversity and body mass index were assessed in 79 households.

Most households experience severe food insecurity (63.3%) and low dietary diversity, yet high rates of overweight (22.4%) and obesity (27.9%) occur. There is sufficient availability of diverse foods locally but financial constraints limit household’s access. Homestead gardening and livestock keeping hardly exist. Communities are surrounded by large commercial farms, providing some employment. Small-scale farmers within the communities mostly engage in cash crop production for overseas markets, not contributing directly to local food and nutrition security. Almost all food chain actors supply part of their produce locally, mostly to informal traders and more independent food retailers. Most households purchase food occasionally from small local retailers but obtain their main purchases at large supermarkets that do not procure locally but through highly centralised distribution chains. Packaged and labeled foods sold at supermarkets are perceived by most consumers to be of higher quality compared to small local retailers.

Rural households encounter unhealthy and unsustainable diets, with local food systems not being fully utilized. Consumer awareness and provisions for local procurement by large supermarkets may stimulate local production and economic activity for more sustainable diets.
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Aim: Highlight the water availability, soda market share and market penetration of two corporations in Mexico that accompanied the implementation of the soda and snack tax initiatives in January 2013.

Methods: This is part of a systematic review and part of a research study looking at the policy process of soda tax in Mexico starting in 2013. Public corporative and governmental documents were included in the review and some estimation made.

Results: In Mexico, for 2008 the annual consumption of soda reached 160 litres per person and the soda annual sales of 16,916,000L and an estimated sugar usage of 1.9 million tons. The market share is represented in 85% by two companies: Femsa-Coca-Cola and PepsiCo, 70% and 15% respectively. For 2011 Coca-Cola Company Mexico sales were 2,684,7 thousand million of units (each unit case equals 5.678 liters). For 2013, Femsa Coca-Cola reported 19,230 and Arca 1,175 thousand million units of soda, excluding bottled water. Free drinking water is estimated to be 11,440 millionL. This amount is 7,491L less than the total consumption in 2011 and 3,534 L less than the total sales of sodas of one company for that year. Soda consumption estimates equals 24% of the water withdraw per capital for 2011.

Conclusions: The problem of potable water access and concessions to the private sector is one of the factors contributing to the massive consumption of soda. Even models on the aetiology of the disease have considered water access as a curtail problem, further research is needed to address this specific issue.
A prudent dietary pattern is associated with a lower risk of Gestational diabetes mellitus

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Background/Objective: Obesity before pregnancy is one of the risk factors for developing Gestational diabetes mellitus (GDM) and research has demonstrated that adherence to dietary guidelines may be lacking among pregnant women. The aim of this study was to investigate the association between maternal dietary pattern and GDM.

Methods: This prospective observational study included 168 pregnant Icelandic women aged 18-40. These were recruited at routine 20 week ultrasound at the Prenatal diagnosis department. All participants kept a 4 day weighed food record at week 20-21. All underwent an OGTT around week 24–26 of gestation. Food data was recorded into the ICEFOOD calculating program based on ISGEM, the Icelandic food database. Principal component analysis was used to extract dietary patterns from 30 food groups.

Results: Only one clear dietary pattern (eigenvalue 2.4) was extracted with positive factor loadings for Seafood, Eggs, Vegetables, Fruit and berries, Vegetable oils, Nuts and seeds, Pasta, Breakfast cereals, Coffee and tea and negative factor loadings for Soft drinks and French fries. Variance explained was 8.2%. The prevalence of GDM among women of normal weight before pregnancy was 2.3% and among overweight/obese women 18.3%. In the unadjusted logistic regression the pattern was associated with lower risk of GDM (OR: 0.54 95% CI: 0.30, 0.98). When adjusting for age, parity, pre-pregnancy weight and energy intake the association remained (OR: 0.44 95% CI: 0.21, 0.90).

Conclusions: The results indicate that adhering to a prudent dietary pattern and recommendations for weight gain in pregnancy may prove beneficial in preventing GDM, especially among women already at higher risk due to overweight/obesity before pregnancy.
THE GO! AUSTIN/VAMOS! AUSTIN STUDY: A COALITION-DRIVEN, COMMUNITY-BASED INITIATIVE TO COMBAT CHILDHOOD OBESITY THROUGH ENVIRONMENTAL AND POLICY CHANGE.

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Introduction: In the United States, communities with “broken” food systems tend to be characterized by poor access to healthy foods, easy access to unhealthy foods, and high rates of chronic disease. This tends to occur more often in communities with higher prevalence of minority and low-income residents. The 5-year Go!Austin/Vamos!Austin (GAVA) study is a coalition-driven, community-based intervention which targets childhood obesity through changing the nutrition and physical activity environment of a low-income, Hispanic community.

Methods: A coalition of community residents, key stakeholders, school representatives, and city administrators was formed. Five activity sectors were formed (i.e. School, Community Nutrition, Community Physical Activity, Daycare, and Afterschool) to target different sub-populations in the community. A number of “key wins” have been achieved in each sector over a one-year period. To assess the impact of this intervention, a comprehensive evaluation plan has been developed. Data is being collected from randomly selected community members, and 5th graders and their parents. In addition, a cohort of 300 families (150 in the intervention community and 150 in control community) will be followed over the 5 year study period.

Results: Baseline results describing the community’s perceptions, behaviors and BMI status at baseline will be presented.

Conclusions: Comprehensive community health interventions have been recommended, but few have been attempted inclusive with political and community support. Forming a coalition and identifying sectors to target multiple areas of influence in the community is one potentially effective way to positively impact key health behaviors related to childhood obesity.

inequalities.
Food sales in Norway based on degree and purpose of processing: A quantitative study on a representative sample of food retailers

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**Background:** The consumption of ultra-processed foods is increasingly recognized as one of the major factors contributing to the global obesity epidemic. Research indicates such products dominate diets in high-income countries and are penetrating markets of the poorest countries, in a lightly regulated global food system.

**Objective:** To assess food sales in Norway, and changes over time, applying a new classification of food based on degree and purpose of processing.

**Design:** Sales data from a representative sample of food retailers in Norway, collected in September 2005 (n=150) and September 2013 (n=170), was analysed. Data consisted of barcode scans of 795 306 individual food item purchases, reporting type of food, price, geographical region and retail concept. Foods were grouped into minimally processed foods, culinary ingredients, and ready-to-consume products (processed and ultra-processed products).

**Results:** Ready-to-consume products represented 70% of purchases and 60% of expenditure in both years. Minimally processed foods accounted for 12% of purchases and 30% of expenditure. Every third purchase was a sweet ultra-processed product. Food sales changed marginally in favour of minimally processed foods and in disfavour of ready-to-consume products between 2005 and 2013 ($\chi^2 (2) =38.097, p<0.001$).

**Conclusions:** Ready-to-consume products accounts for the majority of food sales in Norway, indicating a high consumption of such products. This could be contributing to rising rates of overweight, obesity, and related non-communicable diseases in the country, as findings from studies in Canada also indicate. Policy measures should aim at decreasing consumption of ready-to-consume products and facilitating access (including economic) to minimally processed foods.
Nutrition and lifestyle of free-living Portuguese seniors

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Objectives: To identify in a free-living senior population the main determinants of healthy lifestyles was the aim of this work.

Methods: Cross-sectional study to evaluate the adherence to healthy lifestyles as indicated by adherence to the Mediterranean food pattern (MDP), physical activity (PA), walking or involved in exercise, non-smoking status. A representative sample of 400 Portuguese citizens aged 65 years plus was selected by quota control sampling. A structured questionnaire was used in a face-to-face situation to collect data. Uni and multifactorial analysis were carried out to characterize the study sample.

Results: Adherence to the MDP was above the mean among the free-living Portuguese elderly (mean 22.2±3.9 points), from a maximum of 36 points, 83% of the participants were above the mean. 79% of seniors were not engaged in walking and 89.8% in any type of exercise. The majority of the sample was non smoker (65.5%) and 22.8% ex-smoker. Higher scores of MDP were found more frequently in men [mean 22.3 (95%CI 21.8;22.9)], older elderly [mean 22.2 (95%CI 21.7;22.8)] and with a higher educational level [mean 22.13 (95%CI 22.1;23.4)]. Seniors with significant lower adherence to the MDP were more likely to have a lower monthly income [mean 21.52 (95%CI 22.7-22.4)], tend to live in the North [mean 21.1 (95%CI 20.4;21.8)] and to be smokers [mean 20.5 (95%CI 19.1;21.9)].

Conclusion: There is a need to promote any type of PA amongst Portuguese seniors. The MDP should be promoted in lower income seniors, smokers and living in the North of the country.
The Vulnerability of Farmers in Valencia Negros Oriental to Climate Change: El NIÑO Phenomenon and Malnutrition

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Objective:
The purpose of the study was to examine the vulnerability of farmers to the effects of climate change, specifically the El Niño phenomenon was felt in the Philippines in 2009-2010.

Methods:
- KAP Survey determine behavioural response to vulnerability to the effects of El Niño.
- Body Mass Index.
- Dietary Assessment using 24-hour food recall.

Results:
- 75% of the respondents claimed that crop significantly decreased during drought.
- Indications that households of farmers are large where 51.6% are composed of 6-10 family members with 68% annual incomes below Php100,00.
- Anthropometric assessment showed that the prevalence of Chronic Energy Deficiency Grade 1 among females 17% and 28.57% for Low Normal. While Male Body mass index result for Chronic Energy Deficiency Grade 1 10%, Low Normal 18.33% & and Obese Grade 1, 31.67%.
- Dietary assessment of macronutrient intake of carbohydrates, protein and fat 31.6 % among respondents are below recommended amounts.
- Micronutrient deficiency of Calcium, Iron, Vit. A, Thiamine, Riboflavin, Niacin & Vit. C.

Conclusion:
- Majority of the rural populations are engaged into farming livelihood that makes up the backbone of their economic growth.
- Placing the current nutritional status of the farmers in the context of food security, there are reasons to believe that the status will go for worse if the extreme climatic conditions will once again prevail in the region.
- Farmers rely primarily on home grown crops for their food supply, a reduction in farm production during drought is expected to adversely affect dietary intake. The local government therefore institute programs to increase food resiliency and to prioritize health of the population as the moving force for productivity and development.
Title: Awareness of phosphorus sustainability threats in the EU
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Abstract:

Phosphorus is an indispensable, unsubstitutable macronutrient for virtually all life on the planet. As such, phosphorus plays a crucial role in food security and human health by ensuring soil fertility, maximising crop yields, supporting farmer livelihoods and nutritional security of the global population. It is estimated that phosphorus and other mineral fertilizers are essential to feed around half of the world’s population.

The world’s main source of phosphorus is non-renewable phosphate rock, with deposits only in a few key countries. The demand for phosphorus fertilizers is increasing due to the growing human population and rising per capita meat/dairy consumption. Yet, human activities have broken the sustainable closed-looped phosphorus cycle. As a result phosphorus currently moves linearly from mines to oceans posing risks for its future supply and consequently food security, given there is no alternative to phosphorus as an essential plant nutrient.

Global institutions, governments, scientists and public are increasingly investing in closing the phosphorus cycle and sustaining the future. However, many scientists point out that political and public debate focuses too much on quantifying the remaining phosphate rock and how to secure its national supply, rather than on working out and implementing sustainable policies.

The aim of this study is to examine scientific, political and public communication in the EU about phosphorus. Media content analysis for the timescale 2007-2014 is conducted using NVivo10. It encompasses governmental documents, websites, media coverage and peer-reviewed papers across disciplines, including the relevant economics, agriculture and food, environmental and social sciences. The results provide an insight into the magnitude and focus of interest given by the different voices in the debate on phosphorus. In our discussion, we will highlight the gaps between scientific evidence and communication.
Food at checkouts in non-food stores: a cross-sectional study in a large, indoor shopping mall, UK

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Background

The problem of unhealthy foods displayed at supermarket, but not non-food store, checkouts has been highlighted. We aimed to document the display of food at non-food store checkouts, to classify foods by nutrient content, and record the presence of price promotions and whether food is displayed at child height.

Methods

A cross sectional study in a large indoor shopping mall in Gateshead, UK was conducted, February-March 2014. Two researchers surveyed checkout displays of non-food stores using a pre-piloted tool. Inter-rater reliability was checked in 10% of stores. Foods were classified as “less healthy” or not, using the UK Food Standards Agency’s Nutrient Profile Model. Child height was defined as the sight line of an 11 year old, approximated from UK growth charts. Price promotions at checkout displays were recorded.

Results

Checkout food was present in 32 (15.6%) of 205 non-food stores. Five (83.3%) of six stationary stores, five (71.4%) of seven department stores and nearly a third of game stores had food at checkouts. All 32 displayed “less healthy” food, and 14 (43.8%) of 32 had not “less healthy” options. “Less healthy” food (4.1%) was more commonly subject to price promotion than not “less healthy” (1.0%). 95.1% of less healthy food types were displayed at or below child height.

Conclusions

Many non-food stores displayed mostly “less healthy” foods at checkouts, and at child height. “Less healthy” food was more likely to be on price promotion. Further research into the drivers and consequences of food displayed at checkouts of non-food stores is needed. Regulation may be warranted.
Understanding the Interaction between Leisure Centre Users and their Environment using the Analysis Grid for Environments Linked to Obesity.

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Background:

The obesogenic environment is recognised to contribute towards the increasing prevalence of obesity, which in turn has been linked to the development of multiple co-morbidities including coronary heart disease and certain cancers. This research aims to deconstruct the obesogenic and leptogenic environmental factors in leisure centres and determine how customers interact with the environment. Leisure centres have been selected as a focus for this study as they facilitate engagement with both energy intake and expenditure.

Methodology:

The Analysis Grid for Environments Linked to Obesity (ANGELO framework) can be used to classify obesogenic and leptogenic food and physical activity environments. The ANGELO can be extrapolated further to the design of semi-structured interview schedules to determine the impact of the environment on consumer perceptions, intentions and behaviours. The Nutrient Profiling Tool is an established method for determining the healthiness of the food provision and can be used in combination with NetWisp dietary analysis software to determine the obesogenicity/leptogenicity of the food offering. Triangulation of the data collected, using the above methods combined with non-participant observation, will facilitate a richer interpretation of how customers interact with leisure centre environments.

The findings and concluding remarks from this study will be completed prior to the conference in September 2014.
Sustainability Literacy: a Tool to Improve School Meal Service

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Abstract:

Objective: Our purpose is to show progresses made from 2005 in a little community in Tuscany, with a strategy that has included changing the food, economic, environmental, social and political aspects in the school meal service. This approach, inspired by Tim Lang's “15 new cultural rules for ecological public health eating", has involved an entire community.

Design: The project started in 2005 from a nutritional surveillance to understand children’s eating habits and school menu quality. Children’s eating habits were very far removed from the Tuscan traditional diet rich in plant derived foods and had significant amounts of meat and animal products in the school menu. Food procurement did not meet local food criteria for healthy food. So we have started working with the community to improve, step by step, children diets including changes to the whole school food supply policy.

Results: Since 2005, the school meal service has improved in different ways and contributes to more sustainable and healthy food choices, as well as being resource saving. Some of these improvements involved promoting more vegetable products consumption (lower water footprint), and the “Km 0 Concept” (local products), including seasonal and organic food. The following steps were involved:

2005: nutritional surveillance. The children skipped breakfast at home and eat high energy density snacks mid-morning, in school.

2006: Happy snack at school! The Council started providing every morning a healthy snack to more than 1,200 children in primary schools at no cost to the families.

2007: local farmers start growing an ancient grain (wheat) derived from a local seed bank. The wheat is milled in a local farm and all of the whole wheat flour produced is used in a local bakery to make bread and white pizza for children in every school.

2008-2009: Policy-makers develop an agreement with local farmers to purchase food products grown in the municipal area (max regional area for fish and for some types of meat) to promote local products in school-meals, cut out useless costs (e.g. those related to transportation, packaging and marketing), save money, reinforce the local economy, is environmentally protective and improves the nutritional quality, taste and freshness of school-lunch.
2009-2010: **Km 0** School meals are reviewed and assessed on the availability of local products. Animal foods were reduced in school meals and in some schools, bottled water is replaced with tap water. In each school, a dietitian of the local health system, together with decision-makers, present the project to stakeholder to collect opinions and suggestions for school-lunch.

2010-2011: Dietitians of the Local Health System calculate the water footprint of each school meal and present the results to decision-makers. The Canteen Committee approves the introduction of a vegetable menu, without animal products once a week to reduce the water footprint. The city wins a cash prize provided by the Dept. of Agriculture in the Tuscany Region to further implement the project.

By introducing this system of school-lunches many children will, we hope, now automatically learn what "the meal of normal daily life" should be and recognise foods as a natural resource and product of the work of man and as a fair, sustainable and participatory process which is appropriate for modern development and is a social responsible contribution to health promotion.

**Key findings:**

- Sustainability literacy is a public health imperative

- School meals could become a privileged opportunity to adopt a more varied, sustainable and planned food style, respecting the local agricultural production and human activities.
Zero waste around the table at school!

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Abstract Text

Objective: To lead a pilot experience within two primary Italian schools to measure unserved food and plate waste with the aim of lowering school food waste through the development of effective strategies of management and education.

Methods: For 5 days, we calculated the amount of unserved food and plate waste in ten classes of two primary schools (a total sample of little less then 200 persons/day), respectively by means of direct measures of aggregate selective unserved food and aggregate selective plate waste for each single preparation. Moreover, to obtain a proxy of the environmental impact due to food waste, we calculated the virtual water of the food prepared and the food waste.

Results: The total food waste of both schools represented 31,3% of the total food prepared (89 kilos as unserved food and 43,5 kilos as plate waste). The highest quantities of food waste regarded fruits (29%), vegetables (57%) and bread (44%). The virtual water wasted through unserved food plus plate waste was of 229.000 litres.

Conclusions: The economic crises force us to reflect about ethical as well as practical considerations on the negative effects due to an avoidable phenomenon. Moreover we highlighted how the nutrition value of food left uneaten is nil. In Italy, food waste in schools is still an unrecognized, ignored and low-investigated issue. However, it is possible to foresee and prevent a great part of food waste after appropriate surveys aimed at identifying the areas and the foodstuffs for which the most relevant waste can be recorded.
Towards global benchmarking of food environments and policies to reduce obesity and diet-related non-communicable diseases: The INFORMAS initiative

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The World Health Organization (WHO)’s monitoring of risk factors for non-communicable diseases (NCDs) does not include ‘upstream’ monitoring of many aspects of food environments and policies that influence population diets. INFORMAS (International Network for Food and Obesity/NCDs Research, Monitoring and Action Support) is a global network of public-interest organisations and researchers that aims to monitor, benchmark and support public and private sector actions to create healthy food environments and reduce obesity and NCDs. Monitoring areas are divided into process, impact and outcome modules. The two process modules focus on monitoring and benchmarking the actions of the public and private sector. The seven impact modules focus on monitoring and benchmarking key aspects of food environments, such as food composition, labelling, promotion, provision, access, availability, affordability, and trade. The three outcome modules focus on monitoring changes in behavioural, dietary, physiological and metabolic risk factors, and health outcomes. Some aspects of these outcome components are part of the WHO’s global NCD monitoring framework. The development of protocols and pilot testing is currently on-going. The monitoring framework will be trialled in large and small, and high- and low-income countries globally. Within five years, it is expected that all countries will be invited to collect their own data and contribute those data to a global database for benchmarking food environments and policies. Benchmarking data and good or best practice exemplars will be communicated to policymakers, civil society and the food industry with the aim of stimulating improvements in the healthiness of food policies and environments.
SAFETY OF FOODSTUFFS AT THE END OF SHELF LIFE DISTRIBUTED BY A CHARITABLE ORGANIZATION: A FIELD STUDY

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Caritas, an international network of charitable organizations of the Catholic Church, serves every day free food, a part of which is near the end of shelf life, to people in need. The aim of the study is to verify whether freezing is a safe method to store this kind of food.

Using a domestic freezer without the blast chiller, food is retained for a period of 45 days, thawed at 4°C for 48 hours and cooked within the next 24 hours. We carried out microbiological analysis on 30 samples at the time of delivery, 30 after thawing and 30 after cooking. Results are classified in four risk classes.

Regarding Total Viable Count, most of the raw samples are in class IV (danger) but after cooking almost all samples are in class I (no danger). Regarding E. coli, all samples are in class I, except for four raw samples in class II (potential risk). About Staph. aureus, some raw samples are in class III (probable risk) or IV, while all the cooked samples are in class I. Salmonella spp is always absent and the samples related to Campylobacter spp and sulphite reducing clostridia are always in class I.

The preservation of frozen food at the end of shelf life without the use of blast chiller guarantees an acceptable risk for the tested period of 45 days. The use of this procedure represents a potential management strategy to avoid food waste and to reduce inequalities.
Development of the “Good food planning tool” to support a food system approach to food security in remote Indigenous Australia

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Introduction

Few frameworks exist to assist food system assessment and planning especially for remote Indigenous Australian communities. Here we describe the development of the “Good food planning tool” (GFPT). Its application supports stakeholders at the community level to collectively assess the performance of the local food system in their communities.

Method

Development of the GFPT occurred through a four phase iterative and participatory process informed by multiple sources including: literature review, interviews with expert stakeholders, stakeholder workshops, and application of the GFPT and its progressive refinement through multi-sector groups in each of four remote Indigenous communities.

Results

A diverse range of Aboriginal and non-Aboriginal stakeholders had input to the development of the GFPT. Five food system domains and 28 activity areas were identified and form the framework of the GFPT. The domains relate to: (1) strong leadership and partnerships, (2) traditional foods and local food production, (3) food businesses, (4) buildings, public places and transport, and (5) community and services. Each activity area has a set of best practice characteristics to support stakeholder assessment and identification of areas needing policy and/or program attention. There was alignment between activity areas identified by Indigenous stakeholders and those identified through best available evidence and other expert opinions.

Conclusion

The GFPT provides a useful process to facilitate the input of local knowledge and the informed opinions and judgements of diverse stakeholders to ensure that local level plans and policies are developed to support healthy and sustainable local food systems in remote Indigenous communities.
Talking about food sustainability means stimulating critical thinking, highlighting the concept of limit (physical limit and the optional limit of freedom of choice) related to the effects of our everyday actions.

Talking about sustainability for dietitians means thus considering all the sectors that constitute the food system while comparatively assessing their effects according four main points: human health, environment, society and economy.

Food sustainability is strongly related to ethics and equity in the control and the use of natural resources, social justice, food security and respect for the environment, within and between countries.

The individual and collective aspects of choosing and consuming food affect and reflect our relationship with the otherness (nature, the other individual, other consumption cultures, etc.)

The value of the individual and the collective actions in food sustainability can be clarified just referring to the concept of responsibility. The etymology of this word (from the Latin spondeo “I give you my word” and respondeo “I answer to a commitment”) clearly expresses the idea of “responding of something to someone”, that is the commitment to consider the consequences of our actions in terms of effects on the others as well as ourselves.

The pursuit of sustainable food becomes the responsibility of all and primarily of dietitians, who can be a qualified reference for the implementation of a food system that is directed to the protection of health and overall social welfare, by covering different roles in the food chain and carrying out their activity in different professional areas.
A comparison of food environment around secondary schools located in most and least deprived areas in Portsmouth (UK): a case study

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Childhood obesity has reached epidemic proportions in the UK and affects particularly low-income populations. Obesity is linked to environmental influences such as those around schools. Proximity to food outlets and availability of unhealthy foods may have a negative impact on students’ dietary habits. This study determined whether food outlets located around a secondary school in a deprived area in Portsmouth offer less healthy options than those located around a similar school in an affluent area. The location of the two schools was geocoded. Using GIS analysis, a 500m Euclidean radius was designated around each school. All food shops and takeaways in the two designated areas were visited by a registered dietician in July 2011. Food availability, quality, price, signage and visibility of selected healthy and less healthy foods/meals were recorded using audit tools adapted from the literature. Food outlets clustered around the school in the deprived area, where the commercial density was higher (affluent and deprived areas: 16 and 33 food outlets, respectively). No major dissimilarities were observed between the affluent and deprived areas in terms of food availability, quality, price, signage and visibility. However, trends for higher availability of less healthy foods were observed in the deprived area. Additionally, cheap and prominent unhealthy foods were readily available in both areas. The less healthy food environment in the deprived area may contribute to the higher obesity prevalence in that area, but students’ dietary behaviours and other individual variables such as education and lifestyle choices need to be considered.
Programming children for a lifetime addiction to salt: Dietary salt intake in 8-10yr old Irish school children-Results from the Cork Children’s Lifestyle Study (CCLaS)

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Background
Excess dietary salt intake is a critical determinant of the rise in blood pressure from childhood to adult life. Few studies have objectively measured dietary salt intake in children and no Irish data exists.

Methods
Dietary salt was measured from 24 hour urine collections (n=77) and early morning spot urine samples (n=816) taken from a cross-section of 1075 8-11 year old Irish school children. 24 hour salt intake from the morning urine samples was derived by applying a correction for 24 hour urinary volume per kilogram body weight. Urinary sodium estimates were converted to grams of salt per day (g/day).

Results
Population level estimates of salt intake derived from the spot and 24 hour urine collections were similar: mean (sd) median Spot -4.9 (2.5) 4.5g/d vs. 24 hour collections -5.3 (2.5) g/day 4.9g/day). Salt excretion did not differ by sex. Some 43% had salt intakes above the recommended limit of 5g/d. Intake was significantly higher among overweight/obese children (6.3g (3.1) [5.9-6.7]) compared to normal weight (4.6g (2.3) [4.4-4.8]) children.

Conclusion
Almost half of children exceeded the upper recommended age-specific limit for salt intake. Obesity is an important contributory factor in excess dietary salt intake in childhood. Single spot urine samples provide estimates of salt intake of adequate precision for population health surveillance. Public health policies to lower population salt intake, through the promotion of healthy diet patterns, particularly in children are urgently required, to avoid pre-programming them for a lifetime addiction to salt.
The Nutritional Driver's Licence improves the everyday skills in food preparation of school children

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Text

Nutrition-related, chronic diseases in Western industrial nations have a high incidence rate and prevalence. Preventive measures in the school setting ought to positively influence the dietary behavior of children and youth. Especially in this setting, people with varying socio-economic status as well as people from diverse areas of life can be reached.

The nutritional driver's license (EFS) is a school-based primary prevention measure conducted in elementary school. The EFS aims to effect a change in the behavior of school children. They acquire skills that enable them to prepare a healthy meal themselves. However, does this project lead to a sustainable behavior change?

Applying a mixed method approach in explanatory sequential design, the study attempts to answer this question. The approach included a quantitative questionnaire, which was used in 16 classes at 12 elementary schools in the county of Marburg Biedenkopf totaling 992 surveys and a qualitative study with 18 problem-centered, guideline-oriented interviews.

Fortunately, the study indicated that everyday skills in food preparation are encouraged through the EFS. This positive influence, however, must be considered differently as the qualitative study shows that the EFS cannot lead to sustainable behavior change. It opens doors to families that are already concerned with nutritional questions and therefore are careful to live and strive for a nutritionally and physiologically favorable dietary lifestyle. In families that eat cheaply and consume meat regularly, the EFS cannot open any doors. However, this is precisely the segment where a change in eating behavior should be induced.
Seasonal variation in food and beverages household availability – the case of Portugal

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Introduction: Nowadays food consumption is more dependent on cost and convenience than on seasons and weather conditions. However, there are other determinants, such as cultural habits, that influence eating behaviour, giving it a seasonal character independent of production. Seasonal variation in food consumption might not only be reflected in nutritional status but also bias diet related studies and research.

Aim: To evaluate seasonal variation in food/beverages availability of Portuguese households.

Methods: 2005/2006 Household Budget Survey data were used (10403 households). Data collection lasted for two weeks and consisted of the registration of all food/beverages acquisitions in the period. Food/beverages were assembled in 14 groups and household availability was estimated according to the DAFNE methodology. The analysis considered sociodemographic variables and included ANOVA, MANOVA and UNIANOVA tests (\(\alpha=0.05\) and 95\%CI).

Results: Only dairy, fats/oils, and alcoholic beverages did not show significant seasonal differences throughout the year. However, the analysis of its subgroups found increased availability of butter, margarine and wine in autumn-winter, and greater availability of other dairy products (not milk or cheese) and beer in spring-summer. When adjusted for sociodemographic variables, fats/oils also showed seasonal variation, while the effect on vegetables have ceased. A clear variation in the availability autumn-winter vs spring-summer was observed. Nevertheless, the magnitude of the overall effect of season on the founded differences was small ("eta-squared"=0.024) and only nuts showed a medium effect size ("eta-squared"=0.036).

Conclusions: Portuguese households’ availability of most food/beverages groups revealed significant seasonal variation but small magnitude effect.
Participatory Development of a Local Food Guide as Mobilizing Strategy: Experience in Republic of Benin (West Africa)

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Consumers’ orientation for healthy eating is an important aspect of food system interventions to improve nutrition. Food-based dietary guidelines are appropriate tools for the purpose even in low-income countries particularly in cities, because of a rapid nutrition transition. As advocated by FAO/WHO, the development of dietary guidelines has to involve key stakeholders. Only a couple of African countries have their own dietary guidelines. A food guide was developed in Benin in 2010-2014, in the framework of the Partnership Project on the Double Burden of Malnutrition.

The process involved several steps: food grouping, pictorial design, determination of food serving sizes, illustration of selected foods, examples of menus, and formulation of general dietary guidelines. Local key-players from the government, academic institutions, international organizations and civil society were involved at every step. Group discussions were held with adult citizens to get feedback. Linear programming was used to optimize the local diet, taking advantage of recent dietary data. FAO/WHO recommended nutrient intakes and population nutrition goals were used as criteria for optimization. Several graduate students contributed to the process.

The final version of the food guide was officially presented to the national food and nutrition council for formal adoption and dissemination. As follow-up and to foster appropriate use, a multisectoral committee was formed. Training sessions are to be organized, as well as periodic consumer surveys. The Food Guide is intended not only to educate the population but also to contribute to nutrition sensitive agriculture and food policy.
‘Junk Food’ at supermarket checkouts

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Introduction:

safefood (the all island of Ireland government agency) undertook consumer research on the issue of unhealthy snacks at checkout areas. This was allied to our three year childhood obesity campaign (2013 – 2015) focusing on providing parents with practical solutions they can employ with their families. The research findings were then used to call on the 5 major supermarket chains to introduce healthier checkout offerings (February 2014). Currently 1 in 4 children on the island is either overweight or obese.

Method:

A face to face survey of 801 adults comprising a representative sample (November 2013) was undertaken.

Survey Findings:

Almost three quarters (73%) agreed that ‘junk food’ (sweets, crisps, chocolates) at checkouts contributes to obesity; 47% find these foods hard to resist; 32% regularly buy on impulse while queuing and 29% would be more likely to shop in places where these foods are banned at checkouts.

Outcome:

A written response (non committal) was received from four of the five major retailers, discussions have taken place with two. In May 2014 Tesco Ireland announced plans to removes sweets and chocolates from all 146 store checkouts. Tesco Ireland CEO, Phil Clarke said ‘Our customers have made it clear to us that removing sweets and chocolates from checkouts will help them to make healthier choices so we are responding to this”

Conclusion:

Public Health Agencies can prompt healthful change in the retail food sector.
Eating like there’s no tomorrow: People’s awareness and beliefs about the environmental consequence of our food choices.

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Sustainable eating patterns aim to improve nutrition and health, benefit society and sustain the economy, while minimising environmental impacts. Many dietary patterns today are associated with chronic health conditions and are contributing to environmental degradation, but little is known about the public’s view of the environmental impact of our dietary choices. This qualitative study explored people’s awareness and beliefs of the relationship between food, the environment and climate change, with a particular focus on meat consumption. Twelve focus groups and four individual interviews were conducted with adults representing different socio-economic groups living in rural and urban settings in northeast and west central Scotland. Data were generated and analysed thematically using Grounded Theory approaches. In general, people were not familiar with the term ‘sustainable diets’ and had few ideas about what it might mean. Three main themes emerged from the initial analysis on meat consumption and climate change: 1. Links between eating meat and climate change were rare, despite awareness and general acceptance of climate change. 2. Resistance to the notion of reducing their own meat consumption for environmental concerns, with people unwilling to eat less due to (a)the pleasure and central place meat represented in their diet, (b)being sceptical of the science, (c)claiming to have cut down the amount they ate, or (d)they ate little enough meat. 3. Powerlessness regarding changing the food system, with individual contributions unlikely to make any difference. These findings suggest there is limited awareness and acceptance of the link between environmental issues and meat consumption.
INTRODUCTION: Consuming locally procured foods procured may contribute to individual health, community viability, and the local economy. Currently, little is published about the perceived need and feasibility of promoting direct-to-consumer produce sales. We conducted a needs assessment examining perceptions of and participation in the local food system by producers and consumers throughout the state of Nebraska, located in the Midwestern United States. We then applied our findings to pilot a Farm to Institution (F2I) initiative utilizing a web-based ordering system.

METHODS: For the needs assessment, we used a mixed methods approach by conducting focus groups and surveys to assess attitudes and behaviors towards purchasing local foods from the consumer, local producer, and key stakeholder perspectives. Based on these findings, we developed and implemented a web-based F2I program where employees from a mid-sized company in Omaha, Nebraska were able to order local produce online and pick-up at their worksite. Sales and participation were monitored over a 6-week period.

RESULTS AND CONCLUSION: Findings from the needs assessment showed that consumers were interested in purchasing local foods but perceived barriers to be high cost, low availability, and inconvenience. In response to these concerns, the F2I pilot program offered affordable produce directly to the worksite using a web component, which contributed to ease of ordering and profitability for the producer. Sales and participation in the F2I program increased weekly. This study demonstrates the feasibility of meeting consumer interest while also reducing barriers by providing direct-to-consumer produce sales in a worksite setting.
A comparison of fruit and vegetable consumption and wellbeing in allotment holders and non-allotment holders

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While there is some research to show that allotment gardening has a beneficial effect on general health and wellbeing there is currently little quantitative evidence in the UK to support this. The aim of this research was to assess fruit and vegetable consumption and general wellbeing in allotment participants and non-participants. A paper based questionnaire was sent to 468 Aberdeen City Council allotment holders with a second copy of the questionnaire for a matched control (a friend or colleague of the same sex, age and postcode, who does not grow their own produce either on an allotment or in a garden). A total of 104 questionnaires were completed and returned, with 45 pairs of questionnaires from allotment holders and a suitable matched control. Allotment holders (n=45) reported consuming more fruit and vegetables habitually, a median of 7 portions from a 24 hour recall, compared to the 45 matched non-allotment holders who reported a median of 6 (p = 0.01). In addition there was a statistically significant higher proportion of allotment holders consuming the recommended 5 or more portions of fruit and vegetables per day compared to non-allotment holders (p = 0.03). Allotment holders reported higher satisfaction levels regarding time spent outdoors, exercise and diet as a whole compared to non-allotment holders. However there was no significant difference with satisfaction of other aspects of wellbeing, such as weight and life as a whole. The findings highlight the potential contribution of allotment gardens to a healthy lifestyle, both physically and mentally.
**INTRODUCTION:** Farm to School (F2S) is broadly defined as a program that connects schools (K-12) with local producers and distributors with the goal of serving healthy meals in school cafeterias, improving student nutrition, providing agriculture and nutrition education opportunities and supporting local/regional producers. The Gretchen Swanson Center for Nutrition, a non-profit research center located in the Midwestern United States (US) has been working to connect various stakeholders and foster F2S within our region.

**METHODS:** Based on feedback from stakeholders and community identified needs, we developed a F2S online toolkit for use by the three main stakeholder groups: school food service, producers and distributors. The toolkit development process began by taking inventory of F2S resources that were available nationally and determining gaps that could be filled and tools that could be referenced. We then talked in depth with stakeholders to determine specific components to be developed and/or modified for our region, and placed online for free use.

**RESULTS AND CONCLUSION:** This toolkit (www.toolkit.centerfornutrition.org) is comprehensive and discusses general F2S concepts, as well as specific information and resources tailored to food service staff, distributors, and producers. Some of the resources included a list of local producers, seasonality chart, a safety checklist, detailed buying and selling information, and promotional materials. In addition, we also developed a F2S Toolkit Resource Guide, which lists manuals and toolkits from across the US, along with characteristics and special interest topics. This information can be used to develop other similar toolkits both inside and outside of the US.
Food environment assessment in rural Indian context: methodological framework

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Food environment plays a critical role in shaping food and dietary behavior and contributes to nutrition transition in societies facing rising incidence of non-communicable diseases. It is complex in nature due to the inclusion of various layers of assessment (macro level-food supply, school/worksite, local community-food stores/restaurants, household and individual). It helps in identifying the leverage points wherein, interventions may be possible. Rural India presents twin challenges of tradition with intense exposure of electronic mass media and state policy driven development activities. We present the protocol of a methodological framework for studying the food environment at various layers in a rapidly transition area of north India (rural context) and its relationship with body composition of 6-12 years old children. The study site is SOMAARTH Demographic, Development & Environment surveillance site, Palwal district, Haryana where 3 villages (n=100 children of 6-12 year age) were selected for the study. The constructs of the food environment at various layers include availability, accessibility and affordability which forms the basis of assessments in the framework. The geographical mapping (GIS) and assessment of food stores/restaurants, use of secondary data for assessing PDS, assessing types of foods available in school, household food purchase records (30 days) measuring the barter system, purchase patterns, self-produce and consumption of the available food by children using dietary recall and FFQ have been estimated. Body composition was assessed by measuring height/weight/skin fold thickness. The results show that there are emerging relationships between the body composition and a few levels of food environment.
**Food for Life Partnership – transforming food culture through a ‘whole setting approach’**

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Despite the challenge of an obesogenic food environment, evidence suggests that it is possible to transform food culture though adopting an exemplar approach in schools.

The Food for Life Partnership has pioneered this approach in schools across the UK, helping them maximise take-up of healthy lunches, and give children key skills and a love of food via cooking, growing and farm visits.

This approach is proven to change behaviours, improve educational attainment and change food systems. Independent evaluation found:

- a 5% increase in school meal uptake, and 13% increase in free school meal uptake
- a SROI to the local economy of £3 for every £1 spent
- a 28% increase in the number of children eating five or more portions of fruit and vegetables, with 45% of parents reporting eating more vegetables

The whole setting approach in schools has been adopted by the recent government-backed School Food Plan to improve food in schools. The Food for Life Partnership is also being commissioned by local public health teams to take this approach into settings across the life course – including hospitals, early years settings and care homes – to ensure the consistent provision of nutritious food and the promotion of a healthy food culture.

‘Whole setting’ interventions, as part of a local authority-centred ‘whole systems’ approach, are demonstrating the potential to achieve population-level impact. This work is now attracting interest from health organisations across Europe and beyond, interested in piloting a similar approach.
Our food systems have detrimental impacts on the environment, including land, soil, air and climate. Food production, processing, transportation, storage and packaging, together with an ever-increasing population and changing food consumption patterns is using natural resources and producing waste at unsustainable rates. The safe operating boundaries of several systems critical to maintaining a functioning biosphere have been exceeded and several more are at high risk. Our dietary choices have been identified as a key driver. Public health depends on having a safe operating environment. Likewise, public health depends on the provision of adequate and secure nutrition. It is therefore essential to achieve a balance between feeding ourselves and preserving the planet. Given the strong interdependencies between public health nutrition and environmental degradation, we suggest a new paradigm, Environmental Nutrition, as the new frontier of research and practice. This new element will necessarily entwine public health, nutrition, environmental remediation and conservation. We propose an Environmental Nutrition model, a conceptual framework that encompasses many physical and social dimensions of the food system, including the detrimental impacts on the biosphere and population health. The model considers food production and consumer demands as separate, yet integrated key concerns, which must be adjusted to account for a growing population that requires adequate nutrition and a safe environment. We also suggest a practical framework for ensuring the key elements of Environmental Nutrition are considered within the public health realm, and provide an overview of how the research agenda needs to respond in order to inform policy.
School lunch adequacy and food waste: influence on nutrient intake of primary school’s children

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Objectives

This study aims to determine if the lunch provided at school and consumed by children complies with nutritional standards and to assess the impact of food waste on nutrient intake by primary school children.

Methods

From the city of Porto (Portugal), 21 primary schools were chosen and all fourth-grade children were considered. The weighing method was used for evaluating initial servings and plate waste for soup, main dish and fruit. Energy and nutritional content of meals served, consumed and wasted were estimated using the software Food Processor Plus. The mean nutritional value of food served and consumed was compared with dietary guidelines.

Results

Overall, the school lunches served did not meet the dietary guidelines for energy, macro and micronutrients. Only 12.5% were adequate for energy, 33.5% for proteins, 11.9% for carbohydrates and 57.1% for lipids. In the majority of meals served, energy and macronutrients were below the age-specific lower limit, namely for energy (83.7%) and carbohydrates (86.8%). Furthermore, children wasted 26% of the calories provided in lunches, corresponding to 91.5 kcal.

Conclusions

Lunches offered and consumed by children at school canteen failed to meet the nutritional standards. These results are not only a consequence of lunches served but also a result of the high plate waste values observed.
Assessing Sustainable Nutrition Security: the CIMSANS approach

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Most assessments of future food security are based on models of crop, livestock and fisheries yield, combined with economic and other models of the area ‘harvested’. While such analyses offer valuable insights into potential food production, the models used are not designed to predict food ‘quality’, i.e. nutrient content. Further, and as nutrition security is widely recognized as being in part determined by economic, physical and social access to healthy and nutritious food, and underpinned by an adequately functioning food system, these ‘productionist’ approaches do not alone allow for an effective assessment. In reality, the determinants of what an individual/community actually consumes depends on factors such as affordability, preference, cooking skill, convenience and cultural norms, rather than what is produced per se. ‘Sustainable’ nutrition security (SNS) is even more challenging to assess as a set of sustainability metrics is needed, balanced across the economic, social and environmental aspects of the food system.

This challenge is being addressed by the ILSI Research Foundation’s Center for Integrated Modeling of Sustainable Agriculture and Nutrition Security (CIMSANS) project “Assessing Sustainable Nutrition Security”. This poster will present the overall CIMSANS conceptual framework being developed to integrate a range of modeling approaches and information sources to determine the food security outcomes; and will show how the ‘food-related’ aspects fit within the wider concept of nutrition security developed by the nutrition community. Plans for delivering the ultimate goal of an assessment in the form of a gridded spatial data layer depicting global SNS will also be presented.
SuperKids for SuperFoods: Youth-focused Nutrition Literacy and Nutrition Security Service Learning Program

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Schools and youth programs all over the United States host food drives, especially during the holidays. Youth are encouraged to bring in unused and/or unwanted food from home (aka reach to the back of their pantry) to donate to the local food bank. Until now, there is no education curriculum available about the importance of donating nutritious food to people struggling with food insecurity and why the foods we eat are so critical to our overall healthy and wellbeing.

SuperKids for SuperFoods (SKSF) is a service-learning program designed to educate elementary, middle and high school aged youth about the benefits of nutrient dense foods, while offering a community wide approach to alleviating hunger and obesity. Through a six-week interactive program, youth are engaged as leaders and advocates as they host a (healthy) SuperFood Drive in their community and learn to Give the Gift of Health to neighbors in need. SKSF utilizes a proven service-learning implementation process model and combines that with nutrition education teaching topics. Each week includes classroom activities, home activities, reflection and outcomes. Teaching topics can be expanded into multiple sessions to meet the needs of each school or program. Students are asked to engage their families, their peers, and their community throughout the program.

Objectives of the program include advocating food system change, understanding food equity, promoting civic engagement, fostering creativity, and encouraging philanthropy. Outcomes of our pilot program thus far includes significant individual behavior change around basic nutrition knowledge and healthy food choices in participating youth.
What’s cooking at Wattle Hill? Has the food growing initiative reached the kitchen?

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The City of Whitehorse is an affluent local government area that includes pockets of disadvantage. Wattle Hill public housing estate (WHE) located within Whitehorse has a food insecurity rate of 42%, 10 times the Whitehorse average of 3.9%. A food growing initiative commenced mid-2012 to improve access to affordable nutritious foods, providing residents of WHE with food gardening resources, supports, and training. This evaluation aims to assess the impact of the initiative on participants and to determine other factors contributing towards change.

Structured interviews were conducted with 15 residents associated with the initiative, and related to food growing behaviours, attitudes, skills, economic impacts, perceived barriers, and resources/supports/ received and training attended. Data was analysed qualitatively and key themes extracted.

Majority of respondents were growing a greater quantity and variety of food than 12 months ago. The initiative had the greatest impact on increasing vegetable growing behaviours, attitudes and skills, and least impact on fruit growing. Respondents with no food gardening experience and those actively involved with the initiative benefited most. Many reported financial benefits, with a majority incorporating home-grown produce into their diet.

Recommendations include: interpreter services for culturally and linguistically diverse participants; summary sheets for those unable to attend training sessions; improvements to the mentoring program; a community garden; and education tailored towards fruit growing. Further evaluation of the food growing initiative is required to determine sustainability and effectiveness over time in increasing access and availability of affordable, nutritious food to residents of Wattle Hill Estate.
European citizens are generally food secure today. However, poverty and malnutrition are truly a priority on the EU agenda. In Europe, 80 million people live below the poverty line and among them, 30 million suffer from malnutrition (Source: Eurostat and European Congress of Experts on Nutrition, 2009). Moreover, there is an alarming increase in the levels of malnourishment related to unhealthy food consumption trends, which is reflected in the spread of food-related diseases like obesity and nutrient deficiency.

The aim of this research is to gain insight in the perception of food and nutrition security (FNS) among Flemish citizens. The research is based on media analysis applied to articles published in both agriculture-oriented media sources and vulgarized literature, like daily Newspapers and popular magazines. Over 400 articles, published in the period 2009-2014, were coded and analyzed using QSR Nvivo 10.

The analyses provide insight in the focus of different media when communicating about FNS as well as changes in the focus of media over the last 5 years. Tag clouds are generated to visualize the output of the research. The results highlight the gap between research and public media in the context of FNS.

This research is a first phase in the FP7 project TRANSMANGO, which aims to obtain a comprehensive picture of the effects of the global drivers of change on European and global food demand and on raw material production and, consequently, on food flows.
Interventions addressing food insecurity: a scoping review to map the existing evidence-base

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Background

There is a high food insecurity burden in low-and-middle-income countries (LMICs). Systematic reviews, which assess the totality of evidence using transparent methodology, are essential to identify the most effective interventions for improving food insecurity.

Objectives

To conduct a scoping review to identify and map systematic reviews addressing food insecurity in LMICs, and identify gaps for a new systematic review.

Methods

We searched 8 databases (May/July 2013) for systematic reviews of interventions addressing food insecurity implemented in LMICs, compared with any control, and measuring any outcomes. We performed duplicate screening and data extraction, and assessed methodological quality using AMSTAR. We mapped the reviews by interventions and outcomes.

Results

We screened 1161 records, and included 29 reviews. Most reviews addressed food availability (14/29); specifically assessing interventions to improve food production (6/14) and food supplementation (8/14). Many reviews addressed food utilization (13/29), of which 10 aimed to improve food choices and dietary intake. Fewer reviews addressed food access (7/29). Of these, none assessed interventions addressing infrastructure, transport or coping strategies, and only one each addressed food prices and social environment. Measures of nutritional status (e.g. dietary intake, anthropometry), food purchases, expenditure, production, health indicators, and breastfeeding initiation rates and duration were commonly reported outcomes. Specific measures and classifications varied considerably across and within included reviews, which complicates comparisons of results.

Conclusion

Our scoping review identified a gap in existing evidence concerning interventions addressing food access. This finding has informed a planned Cochrane review assessing interventions for improving food access in LMICs.
Diet is important for the health of the individual and population. For the national economy, healthy population is essential. To be healthy, safe and nutritious food environment should be established. For the planning for food environment, there is the need for the estimated amount of food to be supplied. Estimated amount of food should be adequate for the health of the population. In this study, the amount food supply per capita for the 2030 was estimated. The estimation is based on the Food guide by the Korean Dietary Reference Intakes and the current food consumption pattern. Data from 4th National Health and Nutrition Examination Survey are reanalyzed for the food consumption pattern. Nutrient goals for the population and key nutrients are selected based on the Dietary guidelines and nutritional problems of Korean population. With the Food guide, the recommended amount of energy were calculated, based on the population in the year 2030. With the consumption pattern and the Food guide, food were selected. Since selected foods were 'as consumed', foods were converted 'as purchased' through several steps. For the Grain group, 330.49g, Meat, fish, eggs & bean group, 195.05g, Vegetable group, 358.32g, Fruit group, 217.30g, Milk group, 186.92g, Oil & sugar group, 12.93g, respectively were estimated as the recommended supply for the year 2030.
Studying the environmental impact of different diet scenarios for the Netherlands by Linear Programming with Optimeal

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**Introduction:** eating according to dietary guidelines or vegetarian and vegan diets are suggested predetermined options to reduce the environmental impact of diets. We propose an alternative approach that minimizes changes to the current diet.

**Approach:** we used a Linear Programming tool (Optimeal) to find solutions that were as close as possible to the current diet. All solutions met a comprehensive set of dietary requirements. First we found the closest healthy diet that met all requirements (energy, macro- and micro- nutrients). Then we removed meat, fish, dairy and eggs in steps while restoring nutritional adequacy. Finally, we searched for the closest diet that achieves the same environmental reduction as the most restricted option (vegan), but without limiting any products. As a metric for environmental impact we used a single score commonly used in Life Cycle Assessment (LCA).

**Results:** the closest healthy diet had a similar environmental impact as the current diet. Although two vegetarian and a vegan diet had a reduced environmental impact, they required high amounts of changes to meet the nutritional requirements. The maximum environmental reduction obtained in these scenarios was 30%. The optimal solution for the same environmental target needed less changes than any of the predetermined scenarios.

**Conclusions:** we introduce an innovative and systematic way of developing healthy and sustainable diets. It is possible to find less restrictive solutions than vegetarian or vegan diets that satisfy all nutritional requirements and have less environmental impact than the current diets. Most importantly, these are easier to achieve because changes were minimized.
Nutrition sensitive agriculture: new term or new concept?
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Along the post-2015 agenda discussions, sustainable development goals are drafted. In this context nutrition-sensitive agriculture has been introduced. Therefore, the question arises if this is a new term only or a new concept with a comprehensive definition and framework as well as political will? On the basis of a modified UNICEF conceptual framework of malnutrition constituting nutrition security as an outcome of food security, care and health environment the literature was reviewed. A questionnaire-based survey with representatives of 18 agricultural ministries from various countries was conducted, and the final communiqué of the Berlin Agriculture Ministers’ Summit 2014 was analyzed as indication of political commitment following the steps of the qualitative content analysis of MAYRING.

Most publications (90 %) which were reviewed referred to food security, in particular diversification (82.5 %), less to health (57.5 %) and rarely to care (37.5 %). Furthermore, care as significantly less considered than food security and health in the responses to the questionnaire and not mentioned at all in the final communiqué.

These findings indicate that nutrition-sensitive agriculture has rarely been discussed from a systemic perspective. For putting nutrition-sensitive agriculture into research and policy practice the underlying causes of malnutrition - food insecurity, poor health and lack of care - need to be considered along the value chain. At present, nutrition-sensitive agriculture is more term than concept.

A precise and clear communication of the linkages and relationships of nutrition should be applied and a comprehensive definition of nutrition-sensitive food systems and an integrative framework need to be defined. This requires inter- and transdisciplinary research and true multisectoral collaboration.
Multisectoral nutrition capacity: critical for building healthy global food systems.

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A global consensus on the need to act in nutrition has been building for over a decade. Even though more than enough food is produced globally, a half of the world’s population is affected by some form of malnutrition, including hunger, micronutrient deficiencies, and obesity. We contend that malnutrition is a product of global food systems failure, exacerbated by sub-optimal efforts to build human resource capacity to act on malnutrition. The breadth of capacities needed to act on malnutrition and how to build these is still not widely understood. Workforce capacity, particularly in the health and agricultural sectors, has been recognised as a key determinant of a population’s capacity to prevent and ameliorate malnutrition. Enhancing workforce capacity via a workforce development strategy is influenced by the size, distribution, competence, professionalization and support for the workforce across multisectoral jurisdictions.

Workforce development in this arena needs a robust quality assurance framework and a flexible educational platform to effectively build the capacity of a critical mass of practitioners at different levels of the global food and nutrition system. A competency framework for public health nutrition (PHN) professionals has been developed and an individual practitioner certification system established. The need now is to establish standards for creating multi-sector and multilevel nutrition capacity, including a framework for PHN program accreditation that could provide curriculum guidance and ensure Quality Assurance worldwide. The authors propose such a framework as well as a flexible, open learning delivery mechanism to enable a globally relevant and accessible capacity building initiative.
Food security entails sustained physical and economic access to sufficient, safe and nutritious food to meet dietary needs and food preferences for an active and healthy life. While more than enough food is produced globally, a half of the world’s population is affected by some form of malnutrition, including hunger, micronutrient deficiencies, and obesity. While dietary intake is not the only determinant of nutritional status, it is key. Diets are changing in many LMICs, influenced by national factors, including changes in land usage, urbanisation, consumer preferences, agricultural and food policies, the spread of supermarkets and, increasingly, by global factors including liberalisation of agricultural and food trade, and foreign direct investment by large companies in the food system.

South Africa has a large burden of malnutrition, with persisting significant rates of childhood stunting and high and accelerating rates of obesity – often in the same poor households. The rapidly changing, and increasingly globalised food system, is strongly implicated in widespread food insecurity. South African food companies’ expansion into SADC countries is also rapidly changing their food environment.

Recognising this, the South African government has funded a new ‘Centre of Excellence’ for research on food security. Based at the universities of Western Cape and Pretoria this CoE is currently defining transdisciplinary research projects focussed around four linked themes: Food Creation, Food Distribution, Food Consumption with an explicit focus on health and nutrition, and Food Governance. The nascent research agenda will be presented in the hope of receiving input from colleagues in Public Nutrition.
Factors associated with food insecurity in the elderly population in Israel

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Background: Food insecurity among the elderly may affect their nutritional status, exacerbate social, functional, and medical problems and undermine their ability to live independently. Globally, the proportion of people aged 65+ years is expected to double between 2010 and 2050 and reach 16%.

Objectives: This study examined food insecurity among elderly, age 65+, in Israel and associations with socio-demographic factors, dietary intakes, nutritional and health status to inform social assistance and health promotion programs.

Methods: The MABAT ZAHAV Survey 2005-06, the first National Health and Nutrition Survey of the elderly in Israel, collected data on socio-demographic characteristics, food security (USDA food security module), medical conditions, and included anthropometry and a 24-hour dietary recall. The data analysis covered 1478 Jewish and 300 Arab free-living elderly interviewed in their homes.

Results: Among all households, 16% were food insecure. Jewish late immigrants and Arabs had higher food insecurity; poverty and lack of formal education were identified as main risk factors (odds ratios=8.4 and 6.1, respectively, p-values=0.000, controlling for late immigration, ethnicity, household size, age, and sex). The food insecure had lower intakes of vegetables, fruits, meat, energy, protein, and micronutrients. Food insecurity was associated with poor health, osteoporosis, obesity among women, chewing problems, limited functional capacity in activities of daily living (shopping, cooking, etc.), insufficient physical activity, dementia, lack of social support, loneliness, anxiety and depression.

Conclusion: Income transfer and food stamp programs should be complemented by congregate dining and “Meals on Wheels” programs to meet the needs of elderly with functional limitations and counter social isolation.
The role of locally available foods in improving food and nutrition security in rural Cambodia

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In the last decade, Cambodia's poverty rate has declined but malnutrition rates remain high, and complementary feeding practices continue to be poor. In 2010, 40% of children less than 5 years old were stunted, 28% underweight and 11% wasted. In 2011, FAO Cambodia implemented the 42-month MALIS project to improve agricultural productivity and profitability, diversity and resilience of farming systems, and improve food security and nutrition of vulnerable smallholder farmers in Otdar Meanchey (OMC) and Preah Vihear (PVR) provinces. A key component of the MALIS project is the nutrition education intervention, which commenced in July 2013 with training of trainers and community volunteers. To ensure agriculture-nutrition linkages, a total of 449 mothers/caregivers with their infants and young children aged 5-18 months were selected from Farmer Field Schools (FFS) and the wider community and enrolled in the nutrition education intervention. In August 2013, the first round of seven nutrition education sessions commenced in 19 villages of OMC and 16 villages of PVR that were facilitated by 91 community nutrition promoters (CNPs). The intensive training focused on improved infant and young child feeding (IYCF), hygiene and food safety practices. During participatory cooking demonstrations mothers/ caregivers learned how to prepare improved thick and multi-ingredient porridge (bobor khap krop kroeung) from locally available foods, and how to responsively feed their young children to foster growth and mental development. MALIS project monitoring activities focus on improving the quality of IYCF training and identifying enabling factors for mother/caregiver behaviour change in relation to complementary feeding.
Welfare retrenchment and food bank use in the United Kingdom.

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The measurement of household food insecurity on national surveys in Canada and the US has revealed this problem affects more than 10% of households. In the UK, it is only with the recent exponential rise of food bank use that this issue has been identified as a potential public health concern. There is considerable debate about what has caused the rise. This study explores the link between recently implemented austerity measures and the rise of food bank use across eleven geographical regions in the UK. Using publically accessible data on spending on services, welfare sanctions, and regional food bank use, we examine the relationship between the annual percentage changes in these variables over the 2011/12 to 2013/14 period. We observe that where regions experienced greater annual increases in welfare sanctions and greater annual reductions in their service expenditure, there were greater rises in the number of people using food banks. Of concern is that food bank use may underestimate the magnitude of food insecurity because households may not be able or willing to use this form of charitable food provisioning. Research has indicated that food bank use is not able to prevent households from experiencing recurring food insecurity and that this experience is associated with greater risk of inadequate nutritional intakes and psychosocial consequences. Thus, this study indicates the recent welfare retrenchment in the UK is negatively impacting the ability of households to access enough food to meet their needs, which has negative consequences for their nutritional health and well-being.
IMPACT OF FARMERS’ MARKETS PLACES AT SCHOOLS AS A STRATEGY TO INCREASE ACCESS TO FRESH VEGETABLES IN A LOW-INCOME COMMUNITY

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Introduction: Limited access to quality, fresh vegetables, has been documented in low-income communities. Increasing access through farmers markets and farm stands (e.g. small farmers’ market) is an increasingly popular and recommended strategy, with multiple benefits. The Farm-to-Families (F2F) pilot study aimed to assess the feasibility of implementing a farm stand-based strategy at an elementary school located in a low-income community in Austin, TX, to increase access to fruit and vegetables. Methods: A farm stand was placed outside of an urban elementary school in a low-income community once a week, for 8 weeks to sell fresh, locally grown produce. Produce was sold at whole sale cost, with minimal health promotion. Pre and post surveys were administered, measuring psychosocial and behavioral factors related to purchasing practices and vegetable consumption. Results: Participants (n=52; 96% Hispanic; 90% reporting running out of food before the end of the month) reported eating more vegetables after the farm stand (85%). 100% of participants reported wanting the farm stand to return the following semester. Financial data indicate that each week of the intervention more produce was sold. Conclusions: School farm stands are a viable option for increasing fresh food access in low-income communities and creating a more sustainable food system. Future steps are to develop and test a model that includes on-going partnerships between local farms and schools to increase sustainability. More research is needed to determine how to make this strategy more profitable for farmers.
Perceptions Held by Masters Students of the NOMA track module on Nutrition, Human Rights and Governance

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A NOMA Track module on ‘Nutrition, Human Rights and Governance’ was developed jointly by four academic institutions in Norway, South Africa and Uganda, incorporated into their respective Masters programmes in nutrition and presented consecutively in the three countries.

The perceptions of participating students about various aspects of the module were documented to inform future curriculum endeavours.

A mixed methods approach was followed. A module evaluation form completed by students for each study unit was analysed. In-depth telephonic interviews were voice recorded and transcribed. Through an inductive process, emerging themes were used to compile a code list and content analysis of the unstructured data.

The overall positive module evaluation by 20 participants (90.9% response rate) can be ascribed to the planning and content of the module, enlightening study visits, the expertise of lecturers and an interactive approach which enhanced student learning. Logistical issues regarding time-management and administrative differences among the academic institutions caused some concerns. Students experienced some resistance against qualitative research in natural science faculties.

Students benefitted from being exposed to different teaching styles and education systems at universities in different countries. Constructive alignment of teaching and learning activities could be optimised through involvement and empowerment of all relevant lecturers.

The successful implementation of the module not only provides nutrition Masters students with knowledge to operationalise a human rights-based approach during future interactions in their professional practice, but also serves as an example of the benefits and challenges of interdisciplinary and transnational collaboration in module development.
FOOD INSECURITY AND NUTRITIONAL STATUS OF PRE-SCHOOL CHILDREN AND THEIR MOTHERS IN TAMALE METROPOLIS

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Food insecurity and malnutrition have become a major concern in Ghana as it strives to achieve a middle income status and the Millennium Development Goals by 2015. The study was to assess the relationship between food insecurity and the nutritional status of pre-school children and their mothers in Tamale metropolis. An analytical cross-sectional survey was carried out and a two-stage random sampling technique was employed. A total of 337 households with children 6-36 months were randomly selected. The study findings showed that, 39.8% of adults in households consumed quality diet (more diversified diet). 20.5% of households were reported to be food insecure. Prevalence of wasting, underweight, stunting and anaemia among children were 13.4% (95% C.I 10.5-16.9), 27% (95% C.I 22.3-32.3), 29.8% (95% C.I 24.3-35.8) and 78.9% respectively. Among mothers, prevalence of underweight and anaemia were 7.1% and 43.2% respectively. Prevalence of microcytic hypochromic anaemia among children and their mothers were 68.4% and 35.8% respectively. Wealth index was positively associated (P < 0.001) with household food insecurity. Household food insecurity only showed positive significant association with stunting among children (p=0.03) and BMI among mother (p=0.03) but did not show any significant association with maternal and child anaemia. The findings highlights the importance of addressing malnutrition through integrated interventions that enhances household food security and socio-economic status.
How will inequalities in obesity be affected by the new tax on sugar-sweetened beverages in Mexico?

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Background and objectives: Mexico has introduced a tax on sugar-sweetened beverages (SSB), aiming to prevent and reduce obesity by reducing SSB consumption. Research suggests that increases in the price of SSBs lead to larger reductions in consumption among the poorest population groups. This study investigates the potential effect of the tax on inequalities in obesity among Mexican men and women aged 20 to 49.

Methods: Two repeated nationally representative surveys were used for women; n=24,733 (1988 and 2012) and for men; n=18,988 (2006 and 2012). Weight and height were measured and a wealth index was constructed from household assets and characteristics. The social gradient in obesity by wealth was investigated, as were the increases in obesity prevalence by wealth tertile over time.

Results: Among urban and rural men and rural women there was a direct association between wealth and obesity in 2012 (higher wealth—higher obesity prevalence). Among urban women, there was an inverse association between wealth and obesity. Among women, obesity prevalence increased dramatically in all wealth groups, and increases tended to be larger in the poorest group (p=0.05) over the period 1988-2012. Among men, increases in obesity prevalence 2006-2012 were significant in urban areas only, and were similar across wealth groups.

Conclusions: The SSB tax in Mexico may help to avoid increasing obesity inequalities among women. Among men, other strategies to prevent obesity among richer groups may be necessary as the tax will most affect the poorest and least obese group.
DESCISION SUPPORT SYSTEM FOR MODELING AND SIMULATION OF EPIDEMICS CAUSED BY CONTAMINATED WATER

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The paper describes part of the information system for supporting sanitary inspection teams during epidemics of food borne diseases. The discussed part of the system is devoted to simulation of the spread of epidemics caused by contaminated water. In the approach we assume that we can separate the description of water distribution in water system and the evolution of centre of epidemic caused by contaminated water. First water distribution together with pathogen concentration in water network is evaluated by performing simulation of water network - to this end EPANET environment is used. Having information concerning water consumed at nodes of water networked centers of epidemic are created. To each centre of epidemic an extended SIR model is assigned which describes the evolution of infected and recovered populations. Extended SIR models are derived from models related to epidemics of food borne diseases and take into account migration of populations between centers of an epidemic. The proposed DSS is equipped with the calibration module which can be used to estimate parameters of the model, on the basis of observed data, in order to build an adequate model for forecasting. The calibration module uses the Gauss-Newton method modified for dynamical optimization. The approach is illustrated by applying it the Walkerton epidemic caused by the presence of E.coli bacteria in the community water distribution network. Presented simulation results show that the integrated model can describe the Walkerton epidemic with adequate accuracy.

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COMPUTER SIMULATION BASED EXERCISES CONNECTED WITH FOOD-BORNE EPIDEMICS

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The paper presents the simulation exercises system for sanitary inspection. In these exercises a food-borne disease outbreaks are assumed. Food-borne diseases caused by different pathogens are very common disorders. The reason of the epidemic may be caused by one or many different pathogens or toxins and it also can be initiated by terrorists. Sanitary inspection operates under special procedures. On the basis of these procedures the dedicated software application was designed and developed the that allows organizing simulation exercises for state sanitary inspectors. These exercises are organized to improve the best practices of sanitary inspectors’ activities. The system can also support sanitary inspection in their daily work. The simulation exercise system allows for automatic and remote collecting of disease cases, workflow analysis, anti-epidemic activities archiving, making current and aggregate analyzes, performing after action review, etc.

The central database is designed, that stores all patients’ records, taken sanitary inspection actions, the impact of the epidemic, the list of locations where the presence of pathogens was confirmed, and many others. The software developed provides a basis for:

- the organization of simulation exercises for sanitary authorities improve their management skills in many different cases of food-borne disease epidemic,
- analysis of decision-making problems in order to support anti-epidemic operations,
- improvement of procedures used for sanitary supervisors activities in cases of infectious diseases transmitted via food.

The work was partially supported by NCBiR under grant PBS1/A7/6/2012.
Government procurement from family farming as an strategy for promoting food and nutrition security in Brazil

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Recognizing the commitment of the Brazilian State with the compliance with the human right to adequate and healthy food, this work aims to identify the contributions of the National School Feeding Programme (PNAE) and the Food Acquisition Programme (PAA) for promoting food and nutrition security in the country. According to bibliographical revision and documental analysis, it is possible to recognize the government procurement for PAA and PNAE as a significant possibility of access of family farmers to markets. It should be emphasized the importance of both Programmes in establishing sales channels for producers who had few (or none) access to markets, enabling increases in familiar income in rural areas. In addition, marketing to PNAE and PAA potentiates the diversity of food production, the improvement of production and commercialization processes and the diffusion of production systems of low environment impact. From the consumer’s perspective, PNAE and PAA increase access of students and population in social vulnerability situations and risk of food insecurity to fresh, culturally appropriate and locally produced goods. Therefore, PAA and PNAE have become an institutional market for promoting health and sustainable development, and which is able to contribute to the development of a differentiated food chain.
A Health Impact Assessment of the Trans-Pacific Partnership Agreement: Examining the Role of Transnational Food Corporations and International Trade and Investment Agreements in Achieving Food and Nutrition Security

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Increased trade and investment has the potential to help achieve food and nutrition security for all people in all countries. However, the current global food system, supported by trade and investment agreements, is made up of progressively more highly-processed, energy-dense foods that make excellent global commodities given their long shelf-lives and high profit-margins. The current submission will document work in progress conducting a health impact assessment of the Trans-Pacific Partnership Agreement, focusing on its impacts on the Canadian food environment. The key objectives of the project are to understand: (1) the role of food industry in shaping the Canadian negotiating position on the TPP; (2) how potential provisions within the TPP have the capacity to impact the Canadian food supply and food regulatory policy space; and (3) how such agreements, including the TPP, may interact with Canadian international human rights obligations, including the right to health and the right to food. Research methods include literature review, document analysis and key informant interviews. Core areas of analysis will include food industry lobbying and submissions to government; review of relevant state-state and investor-state dispute settlement cases; measures of change in trade in goods (e.g. retail food prices), trade in services and foreign direct investment (e.g. market share of foreign-owned corporations in food retailing), and domestic protections and supports (e.g. export subsidies); and potential interactions between TPP provisions and policy actions highlighted by the World Cancer Research Fund International’s NOURISHING framework. Key areas scoped for analysis and initial results will be presented.
Influence of socioeconomic status and parents’ educational level on food consumption of primary school children

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Objectives

Evaluate the influence of socioeconomic status and parents’ educational level on food consumption of fourth grade school children.

Methods

From the 51 public primary schools of the city of Porto (Portugal), 21 were selected following a multistage cluster sampling and all children attending fourth-grade, aged 9 to 10 years old, and having lunch at school canteen were included (n= 424).

Information on school meals financial assistance and parents’ educational level were collected and children’s dietary intake was evaluated by a 24-hour dietary recall. Energy and nutritional content of meals consumed were estimated using the software Food Processor Plus. The mean nutritional value of food consumed was compared with dietary guidelines according to international recommendations. Anthropometric evaluation was performed.

Results

48.6% of children evaluated were male, 42.3% were overweight or obese and 50.7% of children had no financial assistance for school lunch. Energy, protein and sugar intake was above the recommendations for the age group, and only 12.7% of children met the recommendations for protein and 3.8% for sugar. Breakfast and lunch were the meals that were closer to the recommendations for energy. A high energy and sugar intake through the day was observed for children having financial assistance and whose parents had a low educational level.

Conclusions

Results showed an excessive energy intake and an inadequacy of proteins and sugars intake through the day, being these values higher than recommended for the age group under analysis. A low socioeconomic status is associated with a high energy and sugar intake.
**Nordic Collaboration to Improve the Practice of Public Health Nutrition**

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The overall aim of the new Nordic Network for Education and skills training in Public Health Nutrition (NEPHN) is to reduce the burden of diet-related diseases in Nordic Regions. In order to achieve this, PHN expertise will be further developed to train highly qualified professionals who are competent to address food and nutrition related challenges in the region. Expertise will focus on how to incorporate nutrition into all relevant sectors including agriculture and environment.

The members of this new network initially include staff from universities and university colleges from four Nordic countries (Denmark, Iceland, Norway and Sweden) but one of the aims is to approach institutions in Finland, Greenland, Artic and Baltic Regions where there is an interest in improving practice in PHN.

The objectives for first one-year phase include to (1) map existing education and skills training in PHN offered in the Nordic/Artic/Baltic Regions; (2) map existing relevant e-learning programmes and facilities for education and skills training; (3) develop a work plan for future activities and expansion of the network and (4) disseminate information about the network’s creation.

In the longer term, the network aims at: developing a Nordic core curriculum for accreditation of the knowledge, skills and competencies required by public health nutritionists; developing a range of e-learning...
Developing tools for measuring the contribution of wild edible plants to nutrition: preliminary results of a qualitative ethnobotanical study in Central Tunisia (Sidi-Bouzid governorate).

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Abstract

Objective: To identify wild edible plants (WEPs) consumed by the population and describe their food uses qualitatively in preparation for a quantitative food consumption survey.

Methods: Fourteen key-informant interviews were carried out with personnel of the local agricultural administration and farmers, and 7 focus-group discussions were conducted with women farmers and urban dwellers in 7 of the 12 districts of the governorate in April 2014. Samples of plants were collected for a herbarium and for chemical analyses to complement the Tunisian food composition table.

Results: Thirty-nine species of WEPs were identified as consumed by the population. Their local and scientific names, season of availability, location and abundance were assessed. Knowledge and consumption of WEPs is widespread. The majority of WEPs are green leafy vegetables. Consumption frequency went from a few times during the season to several times per week. The most frequently consumed WEPs were wild fennel leaves, false-rocket, malva, thistle, cardoon, two allium species and cactus pear. Except for cactus pear and false-rocket leaves which are consumed raw, WEPs are eaten freshly cooked as part of couscous, vegetables stews, rice dishes, soups and traditional flat bread. An identification guide was developed as a tool for the upcoming quantitative food consumption survey.

Conclusion:

WEPs may be an important part of the diet of the local population. Compositional analyses are underway and quantitative diet assessment surveys are planned to assess the contribution of WEPs to the population’s nutrient intake. Which segments of the population consume these foods will also be investigated.

Keywords: Wild Edible Plants; food uses; ethnobotany; Tunisia
A food systems approach: The potential role of underutilized wild edible plants in alleviating hidden hunger in Sub-Saharan Africa.

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The aim of this paper is to examine the potential role of underutilized wild edible plants (WEP) and the impact of global agricultural food laws, trade, development interventions and food policies on the micronutrient status of populations living in Sub-Saharan Africa. Historically the international community has responded to hunger in the context of energy intake and protein energy malnutrition (PEM). Modern agricultural systems and practices focus on the production of high-yield staple crops for increased income. As a result, the ongoing promotion of monocultures has contributed to the serious decline in agro-biodiversity while diminishing the accessibility of diverse and nutrient dense foods not only within Sub-Saharan Africa but around the world. Although there are many factors that influence dietary habits and access to quality nutritious foods such as location, cultural traditions and socioeconomic status, the highly centralized food system, the increased trend of urbanization and environmental changes need to be considered when developing future global food policies that seek to ameliorate the nutritional status of vulnerable populations especially those living in the global south. Despite the many interventions to manage and prevent chronic health problems attributed to poor quality diets especially among low-income populations, micronutrient deficiencies continue to persist at alarming rates within and beyond Africa. Therefore this paper also addresses the serious need to invest in agro-biodiversity research and conservation of wild edible plants to help establish not only effective food policies but a sustainable global food system that simultaneously benefits the environment and encourages dietary diversification for improved nutrition.
CONSENSUS ON TECHNICAL, PEDAGOGICAL AND ETHICAL ASPECTS OF TRAINING IN THE AREA FOR NUTRITION POLICY IN NUTRITIONAL SCIENCES GRADUATION IN PORTUGAL

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TRENDS IN FOOD INSECURITY AMONG PORTUGUESE OLDER ADULTS

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The commons approach to food and nutrition: Gradual innovation or counter-hegemonic alternative

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The multi-dimensional values of food as basic need, cultural pillar, human right, natural resource, tradable good and commons render this resource so vital to humans. These dimensions are undervalued and reduced to one by the industrial food system, merely considering food as pure private good (mono-dimensional). This reductionist approach prevents millions to get access to such a basic resource since purchasing power determines its access. With this rationality, hunger and malnutrition still prevails in a world of abundance. However, several food-related elements are still considered as common goods (fish stocks, recipes, agricultural knowledge, food safety, genetic resources) as well as hunger eradication and good nutrition. In this paper, the commons approach is applied to food, deconstructing food as private good and reconstructing it as commons. The authors explore these considerations in two different settings: an agro-biodiversity initiative of non-farmers in Belgium and a food producing initiative of indigenous farmers in Guatemala. The way people perceive food (multi- or mono-) will determine the very nature of the food and nutrition transition: either as innovative niches within the mainstream or counter-hegemonic alternatives. Based on their findings, the authors propose food could be better produced and distributed through a tricentric governance system compounded by market rules, public regulations and citizen’s collective actions. Moreover, the implications for the global food governance would be enormous: food outside commodity agreements, banning food speculation or considering food and nutrition security as Global Public Good.
Evidence of the nutrition and health benefits of indigenous crops remains scarce. The Biodiversity for Food and Nutrition Project is working with Brazil, Kenya, Sri Lanka and Turkey – four countries burdened with malnutrition and yet home to a large variety of indigenous vegetables and fruits whose nutritional potential remains largely unknown – to promote the conservation and sustainable use of local agrobiodiversity. The initiative is exploring the nutritional properties of a select number of species in each country and building on existing work to identify a list of traditional and/or neglected foods with nutrition potential. One such example is the Plants for the Future initiative in Brazil, which lists 74 edible plant species that require further nutritional characterization. Roots and tubers, leafy vegetables and local fruits are some of the current contenders from the four countries that, if suitable, will form the basis for an approach to improve dietary diversity: one that puts traditional, culturally-acceptable and nutritious food at its core. The project will then work across sectors in each country to explore ways in which these biodiverse foods can be mainstreamed into national policies and programmes targeting nutrition and food security, such as school-feeding programmes, as well as developing and improving value-chains for some of these species. Many of these local vegetables fetch higher market prices than imported varieties, providing a more equitable share of the profit to the smallholders who grow them - an important incentive for farmers to grow and conserve these locally important resources.
Industry self-regulation and television advertising of foods to children: a systematic review of evidence from Australia

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Aim: The aim of this study is to systematically review evidence from Australia to determine the amount of unhealthy food advertising on television; 1) currently broadcast during children’s programs and viewing times, 2) since the introduction of industry self-regulatory codes in 2009, and 3) whether advertising differs according to signatory status to the industry codes.

Method: We systematically searched PubMed, Embase and JSTOR(media/marketing) databases, grey literature and reference lists of relevant articles for studies on food advertising in Australia published since 2009.

Results: 316 articles were screened, 25 were considered for eligibility and 8 met pre-defined selection criteria. Meta-analysis of the studies was not possible due to methodological differences across studies. Advertising of unhealthy foods was negligible during programs with a C (children’s) rating, but ranged from 1.5 to 6.5/h during children’s peak viewing times. From 2006 to 2011, unhealthy food advertising decreased by 0.2 advertisements/hour every year, but fast food advertising increased by 0.1 advertisements/h, but these analyses are based on one study with only 5 time points. At children’s peak viewing times, signatories to the industry codes advertise unhealthy foods at higher rates than non-signatories.

Conclusions: The lack of comprehensive data over time meant it was not possible to determine whether advertising changed after the introduction of the industry codes. Nevertheless, signatories continue to advertise unhealthy foods at times when children watch television. Efforts to reduce children’s exposure to unhealthy food advertising need to focus on children’s peak viewing times rather than program classifications.
The impact of area of deprivation on the contribution of foods to fat and saturated fat in the Scottish diet.

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Household food purchase data from the UK Expenditure and Food Survey (EFS) and Living Costs and Food Survey (LCF) are used to monitor diet in Scotland with regards to Scottish Dietary Goals and policy on preventing overweight and obesity. Little difference has been found in population intakes of fat and saturated fat by deprivation despite higher consumption of foods such as whole milk and processed meat in the most deprived. The aim was to identify foods contributing more to fat and saturated fat intake in the least deprived to provide possible reasons for the similarities in overall fat and saturated fat intake.

Combined data from 2001 to 2010 EFS and LCF surveys were analysed to estimate the contribution that foods made to intakes of fat and saturated fat by quintiles of the Scottish Index of Multiple Deprivation (SIMD). Adjustments were made for waste, and data were analysed using general linear models within the complex samples module of SPSS (SPSS Inc., Chicago, IL, USA) weighting to the Scottish population and taking account of sampling methods. A range of foods were found to show a clear linear trend with the SIMD in their contribution to total fat and saturated fat intake. For example, cheese (6.0 vs 4.0%), butter (6.3 vs 4.9%), and cream (1.8 vs 0.6%) contributed more fat in the least deprived versus the most deprived quintiles respectively. There was also evidence that the least deprived had higher intakes of fat and saturated fat from nuts, poultry and cakes and pastries.
Television food advertising: the Pied Piper of Hamelin! Evaluation of food and beverage television advertising targeted to children in Italy

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Objective
To analyze the number and the quality of food and beverage products advertised on television in four different children’s most viewing time in Italy, by means of the UK nutrition profile model (UKNPM).

Methods
From September 2012 to October 2012, for three consecutive weeks, we monitored food and beverage advertisings broadcast on seven Italian networks. Afterwards, each food product advertised was evaluated by the UKNPM and classified as healthy or less healthy.

Results
During the 168 hours of television recorded, n. 345 food and beverages advertisings designed for children and teens, which represented 60.3% of total food and beverages advertisements, were collected. According to the UKNPM, roughly 2/3 of the total advertisements (75.94%) were for less healthy products. By food and beverage categories, 71% of the products advertised were less healthy (67.9% of the foods and 100% of the beverages); specifically, 100% of the cakes and pastry mix, chocolates, sweet cocoa powder, chocolate spreads, non-alcoholic soft drinks, juices, fast food products were all considered less healthy.

Conclusions: In Italy, ultra-processed foods are the most advertised food products on television. Considering that children cannot distinguish between advertisements and cartoons, this makes them particularly vulnerable to messages that may lead to unhealthy dietary preferences.
Health and Economic Burden of Obesity in Tuscany (Italy): the costs of social inequalities.

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Objective. To estimate the health and economic burden of social inequalities in overweight and obesity in Tuscany Region (Italy).

Methods. We used the Italian Behavioural Risk Factor Surveillance System (PASSI)’s data to analyse inequalities in overweight and obesity prevalence by education, economic difficulties and socio-economic level in Tuscany over the period 2008-2012. The burden of premature mortality and NCDs (type 2 diabetes, acute myocardial infarction, stroke) attributable to social inequalities and corresponding healthcare direct costs for the Regional Health System were estimated through a health economic assessment using a dynamic model over a ten-year period.

Results. Over the period 2008-2012 in Tuscany, 30.2% of people aged 18-69 years are overweight and 8.7% obese. PASSI’s data also reveal social inequalities: the prevalence of overweight or obesity being significantly higher in groups with less education (no/elementary education 59.9%; secondary school 45.3%; graduated high school 32.9%; graduated from college or beyond 27.2%) and those with lower income: many economic difficulties 45.7%; some economic difficulties 41.5%; no economic difficulties 35.6% or socio-economic level (low 51.4%; medium 38.0%; high 30.8%).

The price to pay for these inequalities every year includes 439 premature deaths, 202 cases of acute myocardial infarction, 124 cases of stroke, and 1925 cases of type 2 diabetes, with an average annual cost for the Tuscany Regional Health System of 27,381,897 EUR, discounted by 5% per year.

Conclusions. Closing the gap in social inequalities in overweight and obesity is not just a matter of social justice: it improves population health and may be economically cost effective.
The major public health problems in Mexico are overweight, obesity and diabetes. The SSB consumption is related to the weight gain and is a risk factor for obesity and diabetes. Mexico has the largest soda consumption worldwide. The SSB taxation is one of the most cost-effective public policies promoted to reduce SSB consumption and to combat obesity. In Mexico, the SSB taxation was recently approved. The ONG are social important actors because of its ability to influence public policies and it’s action as pressure groups. The Nutritional Health Alliance (NHA) is conformed of 22 public interest NGOs with the goal of comprehensive fight on malnutrition and obesity. This study aimed to describe the NGO’s role for the SSB taxation approval in México. We described the activities and tools developed by the NHA from November 2012 to October 2013. The NHA’s main roles for the SSB taxation in Mexico were: 1) agenda setters, 2) generators of public debate, and 3) information providers. The NHA’s activities and tools developed were: evidence base reports, international forums, public acts, press conferences, media presence and public education campaigns. Funded by Bloomberg Philanthropies.
Can MERCOSUR’s nutrition related structures help promote healthy eating in its member countries?

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The South America Common Market (MERCOSUR) is a free trade area and customs union between Argentina, Brazil, Paraguay, Uruguay, and most lately, Venezuela. MERCOSUR is an important agrifood producer and net exporting bloc. In the last decades, all MERCOSUL countries have faced rapid urbanization, industrialization and achieved greater economic integration to global markets. Transnational food companies became dominant actors in the regional food system taking advantage of the different commodities MERCOSUR countries produce. Important changes in eating patterns have been observed with traditional habits being rapidly replaced by globalized practices. The share of ultra-processed products significantly increased in the Brazilian diet in the last decade. These foods are largely and aggressively promoted as “modern” and “convenient” in all MERCOSUR free trade area where an increasingly obesogenic environment is observed, and obesity is already a serious public health concern to all countries of the bloc. Food trade comprises, on average, around 15% of total intra-zone exports and imports, but with large variations among member countries. There is a need for harmonization of technical regulations related to food. Moreover the bloc can play a key strategic and political role in putting healthy diets and nutritional outcomes at the centre of the global discussions on food systems and trade agreements. The study argues that nutrition related structures and work processes within MERCOSUR, such as the Committee on Food and the Working Group on Food and Nutritional Security, have the potential to play this role, helping address the obesity epidemics in its member states.
Quarrata: Where Nearer is Better! Evaluation of Progresses made in the school meal service of a little community in Tuscany

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Abstract:

Objective: Our purpose is to show progresses made from 2005 in a little community in Tuscany, with a strategy that has included changing the food, economic, environmental, social and political aspects in the school meal service. This approach, inspired by Tim Lang’s “15 new cultural rules for ecological public health eating”, has involved an entire community.

Design: The project started in 2005 from a nutritional surveillance to understand children’s eating habits and school menu quality. Children’s eating habits were very far removed from the Tuscan traditional diet rich in plant derived foods and had significant amounts of meat and animal products in the school menu. Food procurement did not meet local food criteria for healthy food. So we have started working with the community to improve, step by step, children diets including changes to the whole school food supply policy.

Results: Since 2005, the school meal service has improved in different ways and contributes to more sustainable and healthy food choices, as well as being resource saving. Some of these improvements involved promoting more vegetable products consumption (lower water footprint), and the “Km 0 Concept” (local products), including seasonal and organic food. The following steps were involved:

2005: nutritional surveillance. The children skipped breakfast at home and eat high energy density snacks mid-morning, in school.

2006: Happy snack at school! The Council started providing every morning a healthy snack to more than 1,200 children in primary schools at no cost to the families.

2007: local farmers start growing an ancient grain (wheat) derived from a local seed bank. The wheat is milled in a local farm and all of the whole wheat flour produced is used in a local bakery to make bread and white pizza for children in every school.

2008-2009: Policy-makers develop an agreement with local farmers to purchase food products grown in the municipal area (max regional area for fish and for some types of meat) to promote local products in school-meals, cut out useless costs (e.g. those related to transportation, packaging and marketing), save money, reinforce the local economy, is environmentally protective and improves the nutritional quality, taste and freshness of school-lunch.

2009-2010: Km 0 School meals are reviewed and assessed on the availability of local products. Animal foods were reduced in school meals and in some schools, bottled water is replaced with tap
water. In each school a dietitian of the local health system together with decision-makers present the project to stakeholder to collect opinions and suggestions for school-lunch  

2010-2011: Dietitians of the Local Health System calculate the water footprint of each school meal and present the results to decision-makers. The Canteen Committee approves the introduction of a vegetable menu, without animal products once a week to reduce the water footprint. The city wins a cash prize provided by the Dept. of Agriculture in the Tuscany Region — to further implement the project  

By introducing this system of school-lunches many children will, we hope, now automatically learn what "the meal of normal daily life" should be and recognise foods as a natural resource and product of the work of man and as a fair, sustainable and participatory process which is appropriate for modern development and is a social responsible contribution to health promotion
Protecting children in contact with food publicity in schools: the Brazilian case

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The objective of this poster is to provide data regarding the marketing efforts of food companies within schools and to discuss the consequences in children’s bio-psycho-social development.

In Brazil, companies approach children in schools through promotional efforts, such as providing shows with their products’ mascots and sponsoring sporting events, often portraying these efforts as social responsibility actions.

Among the consequences of the exposure to food publicity are the increase of child obesity and non-communicable chronic diseases. In Brazil, 15% of children are obese and 33,5% are overweight. On the other hand, 56% of parents are against marketing efforts in schools.

In April of 2014, an amendment by the National Counsel of Children’s and Adolescents’ Rights (Conselho Nacional dos Direitos da Criança e do Adolescente – Conanda), an office connected to the President of the Republic, established that all merchandising geared towards children is abusive, including those that happen within schools. The Ministry of Education endorsed the norm and established that it would be carried out by the State and Municipal Secretaries of Education.

The amendment respects Brazilian legislation and is in accordance with recommendations by World Health Organization’s (WHO) recommendations, Pan American Health Organization (PAHO) and Ministry of Health for regulating child-centered publicity of ultra-processed foods and non-alcoholic beverages with high levels of sugar, sodium and fat, and protection of the schools from market publicity. It also reflects the preoccupation of other Latin American countries with the epidemic of child obesity and the adoption of regulatory strategies to revert the current situation.
Effectiveness of subsidy targeting through cash transfer on food security and expenditures of urban population in Tehran: evaluation of a program

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Cash transfer is one of the strategies used by many developing countries to improve food security and nutritional status of lower socio-economic groups. The effectiveness of the Iranian targeted subsidy cash transfer plan has been evaluated by comparing data on household food security and food expenditure in six districts of Tehran in 2009 before and 2012 after implementation of new subsidy program (n=266). Validated Household Food Insecurity Access Scale (HFIAS) and socio-economic questionnaire were completed for each household two times with 3 years interval. Statistical analysis was done using SPSS software. Chi-squared test, paired t-test and ANOVA were used for analyzing differences in qualitative and quantitative variables, respectively. Frequency of food secure households has declined from 56.4% to 43.5%, mild food insecurity has increased from 19.3% to 28.4%, moderate food insecurity has risen from 13.3% to 15.5% and severe food insecurity has grown from 11% to 12.5%. The total monthly expenditure and income has been raised significantly from 6100±431 and 7907±827 thousands Rials in 2009 to 8692±869 and 13028±2756 thousands Rials in 2012, respectively (p<0.001) US$ exchange rates were 10,308 and 24,774 in 2009 and 2012 respectively so equivalent figures for total monthly expenditure and income would be estimated as $592 and $762 in 2009 and $351 and $526 in 2012. These results suggest that the replacement of staple food subsidies by cash transfer in its current form not only have any positive impact on household food security, but also has significantly increased household food insecurity (especially marginal or mild food insecurity) and total expenditure of the household which is an indicator of decreasing welfare index.
From Research to Policy in chronic disease prevention: Mandatory salt reduction in South Africa

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Ischaemic heart disease and stroke are the leading causes of death after HIV in South Africa. Excessive salt intake, a major cause or hypertension, is considered to be a major risk factor for cardiovascular disease in the South African population.

A systematic series of studies informed policy development to lower salt in the food supply. These studies determined the main contributors to total salt intake, developed and consumer tested reduced Na variants of these foods, and demonstrated the impact of salt reduction in commonly consumed foods in an 8-week randomised controlled trial.

Bread was the major source of dietary salt intake, providing 25–41 % of non-discretionary salt intake in various groups. Other major contributors include margarine, savoury snacks, processed meats, soup powders and stock cubes. Salt could be reduced in bread by 32 % without adverse impacts on commercial baking properties or taste. The magnitude of BP reduction found in the RCT (systolic BP = -6.2 mmHg (SEM 2.63) (95% CI = -11.4 to -0.94 mmHg; P<0.05) would result in 7 400 fewer CVD deaths and 4 300 less non-fatal strokes per year, with cost savings of up to R300 million/year.

As a result of evidence provided by these studies, and because of political will, South Africa is leading the way globally in policy regarding mandatory salt reduction in various food groups. Legislation on upper salt levels in processed foods will become effective from June 2016. Monitoring and evaluation of the legislation will be required to assess long term effectiveness on health outcomes, as well as to ensure compatibility with the successful salt iodisation programme.
Regulating and monitoring improvements in nutritional quality of foods at what cost?: Systematic review of options for a national food fortification program in Pakistan

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Background: The 2011 National Nutritional Survey reveals that very little progress has been made with respect to multiple micronutrient deficiencies among women and children in Pakistan, with the exception of gains in iodized salt use and large reductions in moderate to severe urinary iodine deficiency rates. While food fortification is safe and cost-effective in the prevention of micronutrient deficiencies, Pakistan has not invested in this strategy at scale. This study investigated options for food fortification, the regulatory environment post-devolution, the role of the private sector and potential agricultural solutions.

Key Findings: There is much support for large scale fortification strategies in Pakistan to address iron and folic acid and vitamin A deficiency. Successful implementation of a sustainable food fortification programme requires a regulatory environment in which government legislation is enacted, compliance is effectively monitored and enforced. Compulsory fortification of staple foods obliges private-sector producers to adapt their manufacturing and quality control processes, requiring financial and technical resources.

Four fortification options were appraised for scale-up: wheat flour fortification with iron, edible oil/ghee fortification with vitamin A and D, biofortification to address iron and zinc content of wheat, and zinc-fortified fertilizers. Benefits included the number of child and maternal lives saved and the future economic consequences from morbidity and/or mortality that were averted. Estimated benefit:cost ratios were 7.2:1 for wheat flour fortification, 9.8:1 for edible oil/ghee fortification; 0.11:1 for biofortification, and 0.06:1 for zinc-fortified fertilizer.

Conclusions: Utilization of food fortification strategies at scale could build on the recent success of the iodized salt programme. Overall success would also require improving infant and young child feeding as well as quality of complementary foods for young children.
“Big Food” challenges: Can the UN Guiding Principles on Business and Human Rights serve to promote the human rights to adequate food and health?

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There are extensive efforts globally to promote the human rights to adequate food, health and an adequate standard of living. However, strong economic interests influence and control production and retailing patterns and marketing, while political counterforces promote international trade with powerful instruments to ensure as few barriers to trade as possible. At the same time, there is increasing participation of private sector actors in the global efforts to improve nutrition. A new approach is needed to enhance corporate and public interaction towards ending or moderating negative impacts of corporate conduct on the livelihood and health of different groups. On September 11-12, 2014, a two-day international seminar will take place in Oslo, Norway, to identify and discuss human rights problems and concerns arising from some of the activities of corporations involved in the production, processing and marketing of foods and beverages. The event will explore how the 2011 United Nations Guiding Principles on Business and Human Rights and/or binding human rights instruments can be used to (i) improve government regulations of corporate practices impacting negatively on health and livelihoods and (ii) promote better respect by corporations for the human rights to adequate food, health and an adequate standard of living. A long-term aim of the seminar is to foster, engage in and further develop research and advocacy networks regarding these issues. Case studies to be analyzed during the seminar are the Code for marketing of breastmilk substitutes, marketing of foods to children, and livelihood impact of the agricultural inputs industry.
"Big Food" challenges: Can the UN Guiding Principles on Business and Human Rights serve to promote the human rights to adequate food and health?

LE Torheim¹, WB Eide², SIDO Granheim ¹, A Oshaug¹, S Roaldkvam³, AT Afrim-Narh⁴, A Eide⁴

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Evaluation of food waste in an elderly center

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The increasing proportion of elderly over the age of 65 is a reality that has been taking place over the years. In Portugal, about 19% of the population is over the age of 65 and about 4.2% is institutionalized in care support institutions. For those, institutions of care support became responsible for most of the food supply, that will be reflected in the nutritional status of the elderly and consequently on their health and quality of life. Food waste assessment allows to estimate the dietary intake of elderly, and identifying the needs of intervention in food services.

This study aims to evaluate the food waste in a nursing home.

The study took place during 12 days, with a sample of 804 lunch meals, in a nursing home with 67 institutionalized elderly (average age 83). The Statistical Package for Social Sciences (SPSS) version 17.0 was used for statistical analysis. The leftovers and plate waste were weighted separately by food groups.

The average of leftovers was 20,4% and the plate waste 12,9%.

According to a classification criteria of food waste, 20,4% of leftovers is unacceptable and 12,9% for plate waste is considered as regular. Although food waste is unavoidable, it is the responsibility of the professionals of the food service to assess the waste, identify the causes, and seek to develop strategies in order to minimize it and to promote a better quality of life to the elderly.

Keywords: Nursing Home; Food waste; Food service; Nutritional adequacy.
Status situation of food purchases directly from family farming for the National School Feeding Programme of Brazil

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Introduction: In 2009, the federal government of Brazil approved the Law 11.947, which establishes standards for the National School Feeding Programme (PNAE) and consolidates its linkage with family farming (FF). The law states that at least 30% of the financial resources transferred by the federal government must be used to purchase products directly from FF and that this acquisition can be done waiving the bidding process. Objective: Describe the implementation of the FF purchases for PNAE in the state of São Paulo, Brazil. Design: This is a cross-sectional descriptive study carried out in 2012. Data from 25 municipalities that bought food directly from FF to PNAE were analyzed. Results: 40% of the municipalities used 30% or more of the resources of the federal government; 100% of them purchased through public call; 80% of purchased from farmers of the same municipality; 36% of the schools had adequate infrastructure for receiving, storage and preparation of FF products; in 92% of the municipalities, all the schools received products from FF; 64% of the municipalities supported farmers for food delivery; in 96% of the municipalities, all the cooks considered themselves able to prepare FF foods. Conclusion: The results show that the implementation of the procurement from FF in São Paulo is advancing. However, it is necessary to strengthen actions to support municipalities to reach the goal of at least 30% and improve the infrastructure of schools.

KEY WORDS: school feeding, family farming.
Description of local procurement from family farming for the Brazilian School Feeding Programme

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Introduction: Since 2009, legislation of the Brazilian National School Feeding Program (PNAE) establishes that out of the total financial resources allocated by the federal government to states and municipalities for school feeding, a minimum of 30% should be used to purchase products directly from family farming. Objective: To characterize sales of family farming for PNAE in the state of São Paulo, Brazil. Methodology: Descriptive cross-sectional study which analyzed, in 2012, data from 110 family farmers who sold to school feeding in 16 municipalities. Results: 55% of farmers sold through associations, 26% through cooperatives and 20% individually; the majority (70%) started selling to PNAE after 2010. Most of the foods sold comprised of fruits and vegetables; all or part of the production of 42% farmers was organic, but only 4 of them (8.7%) were certified; 64% had not been contacted by the nutritionist from the municipality for the identification of foods produced; 65% received no support from the nutritionist during the sale process; 54% received support from some agriculture institution; to 44% of them, the price paid by PNAE was higher than other markets; 76% increased their income after starting selling to PNAE. Conclusion: The results show that the linkage between family farming and PNAE allowed the marketing of fresh and healthy produce to schools and the increase of family farmers’ income. However, in order to maximize results, it is necessary to improve support for farmers by nutritionists and technical assistance bodies at local level.

Key words: school feeding, family farming.
Food System Policies Options for Local Government within the United States: What has the Potential to Impact Health?

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INTRODUCTION: When municipal resources are limited and population health concerns are pressing, it is useful to determine where to focus attention and actions to impact food security and reduce childhood obesity. Numerous organizations have recommended a variety of food-related policies as “best practices” (e.g., fresh food financing) to address these issues. Due to the lag time between policy passage, implementation and monitoring, the evidence-base of how food policies may impact health outcomes continues to evolve. Between March 2013-14, the City and County of Denver, Colorado, United States (US) examined what food systems policy options potentially have the most impact on population-level health.

METHODS: Food system policy “best practices” were reviewed and then triangulated with food policies that had been passed and implemented in cities around the US. For those food system policies that emerged as the most frequently cited and implemented, a review of the evidence-base for each policy was conducted to determine which ones have the most impact on health. Finally, key informant interviews were conducted to prioritize policies specifically for Denver.

RESULTS AND CONCLUSIONS: Best practice food policies in the US included healthy food retail, federal nutrition programs, urban agriculture and institutional procurement. These emerged as having sufficient, promising and/or emerging evidence to support healthy outcomes such as increasing food access, increasing fruit and vegetable consumption and/or decreasing body mass index. By aligning local community health improvement plans and food policy council goals with these findings, municipalities can prioritize their policy efforts to impact population health.