4th International Congress Hidden Hunger

Hidden hunger and the transformation of food systems: How to combat the double burden of malnutrition?

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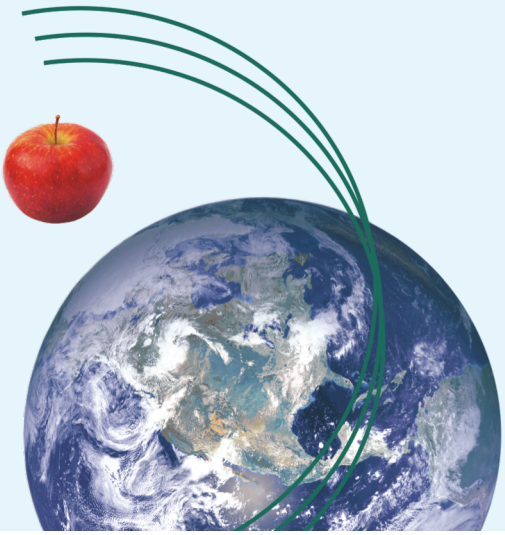

Abstracts – Free Presentations

(IN ALPHABETICAL ORDER OF PRESENTERS AND WHITHOUT ACADEMIC TITLES)

The Nutrition Landscape and Hidden Hunger in Uganda

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Stunting affects 29 percent of children under 5 in Uganda, Underweight affects 11 percent while Wasting affects nearly 4 percent, vulnerability to malnutrition varies from one region to another, with the prevalence of stunting ranging from 14.3% in Teso sub region to 40.6% in Toro sub region. Micronutrient deficiencies, also known as “hidden hunger” are a problem in Uganda. Examples of micronutrient deficiencies that are prevalent in Uganda are anemia – a lack of iron, which affects 53 percent of children under 5 and 32 percent of pregnant women, and vitamin A deficiency which affects 33 percent of children under 5. Like other forms of undernutrition, iron deficiencies vary in prevalence by location and region, with children in rural areas are more likely to be anaemic than those in urban areas (54% and 48% respectively), and a regional prevalence being lowest in Ankole sub region at 31%, and highest in Acholi sub region at 71%.
Similarly, the proportion of women with anaemia is higher in rural areas than in urban areas (33% and 27% respectively), with regional prevalence ranging from 17% in Kigezi sub region to 47% in Acholi sub region. Anaemia is currently a moderate public health problem for women of reproductive age and a severe public health problem for children under five years in Uganda.
Contrary to the recommendation that children under age 6 months be exclusively breastfed, 7% of infants consume plain water, 6% consume non-milk liquids, 8% consume other milk, and 11% consume complementary foods in addition to breast milk before they reach 6 months of age. In addition, 2% of infants under age 6 months are not breastfed at all. The percentage of children exclusively breastfed decreases sharply with age from 83% of infants age 0-1 month being exclusively breastfed to 69% of infants age 2-3 months and, further, to 43% of infants age 4-5 months.
Only 14% of children aged 6-23 months meet the criteria for MAD. The percentage of children meeting MAD requirements in Uganda varies by age group: 6-8 months (15%), 9-11 months (13%), 12-17 months (15%) and 18-23 months (13%). Household Diets are Inadequate in all regions including Kampala, and there is an Increasing shift from home-cooked meals to street food or vended food
The factors identified as influencing infant and young child nutrition (IYCN) practices in Uganda, include; women’s workload and time, teenage pregnancies and frequent pregnancies, alcoholism and gender-based violence, traditions and polygamy, the lack of livelihoods, and food insecurity. These require concerted efforts from various groups within the communities to improve nutrition outcomes. We need to prioritize improving household diets in order to achieve most MDG targets.

The double benefit of biofortification: prevention of micronutrient deficiencies and potential reduction of metabolic syndrome through reduced oxidative stress in at risk populations

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Objectives: The coexistence of undernutrition and overweight/obesity or diet-related non-communicable diseases (NCDs) within individuals, households or populations affects all regions worldwide and is the greatest contributor to morbidity and mortality globally. Additionally, under- or overnutrition early in life, beginning in utero, predispose individuals to overweight and NCDs later in life. Thus, addressing all forms of malnutrition throughout the lifecycle is of paramount importance and requires a comprehensive approach to improving health sustainably through food systems and dietary approaches. Biofortification is a sustainable, food-based strategy to reduce micronutrient (MN) deficiencies-prevalent in under- and overnutrition-through the enhancement of staple food crops with MNs, some of which are also antioxidants and modulators of inflammatory, immune and lipid metabolism pathways. This review aims to better understand the role of dietary nutrient and antioxidant intake, as can be provided through biofortification, on NCDs.
Methods: A review of the double potential of biofortification to address MN deficiencies and contribute to the amelioration of NCDs was undertaken.
Results: Zinc dyshomeostasis has been shown to be related to metabolic syndrome and diabetic complications in numerous studies. NCDs linked to underlying metabolic abnormalities are evident among adult men and women in lower income countries. We hypothesize that a small increase in dietary zinc, like that provided by biofortified crops, will improve the metabolic health of adults with dyslipidemia. Also, dietary increases in carotenoid intake will decrease oxidative stress in key target organs and may reduce the risk of some types of cancer. This is based on findings that zinc and some carotenoids that are targets for biofortification possess separate biological properties beneficial for reducing MN deficiencies and mitigating NCDs concurrently, particularly in population groups with high caloric intakes and low antioxidant nutrient densities. Estimates of Disability Adjusted Life Years attributable to zinc deficiency in high burden countries are revised to include dietary risks of metabolic syndrome (dyslipidemias, cardiovascular events and diabetes) in adults.
Conclusions: Biofortification holds potential to enhance additional components of the diet beyond MNs that could be advantageous to mitigate NCDs, such as slowly-digestible and resistant starches, prebiotics and polyphenols.

Starved and stuffed: outcomes of an advancing food demand transition

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Objectives: The deep transition of food demand, persistent undernutrition, and rising overnutrition shape global health risks, and steeply increasing food demand is degrading environmental systems. Here we want to estimate the future global outcomes of a further advancing food demand transition during the 21st century.
Methods: We developed an open-source model that combines anthropometric and economic approaches to assess historical and future outcomes of a further advancing food demand transition. Our global model covers the period 1965-2100, provides estimates on country level, and accounts for age and sex differences.
Results: The prevalence of underweight increased from 0·5 billion in 1965 to 0·7 billion in 2010 and has now likely reached a saturation point. Under an advancing food demand transition, underweight will decline to 0·5 billion (0·4—0·7) in 2050 and 0·4 billion (0·3—0·7) in 2100. This development is accompanied by higher dietary diversity and increasing body size. However, the intake of vegetables, fruits and nuts will remain at unhealthily low levels, while the consumption of animal-source foods and empty calories increases. The number of overweight and obese individuals increased from 0·4 billion in 1965 to 2·0 billion in 2010, and increases in our scenarios to 4·2 billion (3·9—4·6) in 2050. Total global food demand increased from 12 EJ in 1965 to 30 EJ in 2010, and could reach 45 EJ (43—47) in 2050 and 47 EJ (36—62) in 2100. Food waste is projected to rise from 20% in 2010 to 23-26% in 2050, and demand for animal-source foods from 5 EJ to 10—12 EJ over the same period.
Conclusions: If the current food demand transition continues, the sustainable development goal of zero hunger cannot be reached, obesity and associated diseases will burden public health systems, and environmental pollution will exceed planetary boundaries. Policy interventions need to be scaled up urgently to steer the transformation towards healthy and sustainable diets.

Double burden of malnutrition and climate change effects on food and nutrition security

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For more than 5 year,Bright Youth Farmer Organization (BYFO), has been directing its activities targeting the reduction or prevention of stunting, wasting, overweight, exclusive breast feeding, anaemia in women of reproductive age and adult obesity which has been rampant in the area resulting in hidden hunger and double malnutrition,we sensitized and built capacity to the community on how hidden hunger is caused emphasizing to them to eat quality food which meet nutrient requirements with micro-nutrients such as the vitamins and minerals that is needed for their growth and development, we sensitized and trained them in sustainable agriculture and how they can mitigate or adapt to climate change, grow and eat enough fruits and vegetables to ensure that they get vitamins, minerals and essential nutrients so that they do not suffer from malnutrition. They learnt that: climate variability and extremes are among the key drivers behind the recent up-tick in global hunger and one of the leading causes of severe food crises,and the cumulative effect of changes in climate is undermining all dimensions of food security food availability, access, utilization and stability, hence nutrition is highly susceptible to changes in climate and bears a heavy burden as a result, as seen in the impaired nutrient quality and dietary diversity of foods produced and consumed, the impacts on water and sanitation, and the effects on patterns of health risks and disease, as well as changes in maternal care, child care and breastfeeding, and learnt that actions need to be accelerated and scaled up to strengthen resilience and adaptive capacity of food systems, people's livelihoods, and nutrition in response to climate variability and extremes, and that solutions require increased partnerships and multi-year, large-scale funding of integrated disaster risk reduction and management and climate change adaptation programmes that are short-, medium- and long-term in scope. So the signs of increasing food insecurity and high levels of different forms of malnutrition are a clear warning of the urgent need for considerable additional work to ensure we “leave no one behind” on the road towards achieving the SDG goals on food security and nutrition. Therefore to combat Hidden hunger, double burden and all multiple forms malnutrition, we need to prioritize all interventions which lead us to combat climate change in all its form.

How smart food concept can lead to transformation of food systems and combat hunger and malnutrition?

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Some of the biggest global issues are poor diets, environmental concerns and poverty. If we want to tackle malnutrition, fast growing lifestyle diseases such as diabetes, and environmental issues like climate change and water scarcity along with poverty, we need to bring in more diversity and mainstream some 'traditional' food back as staples. Specifically, this should not be tackled with just any food but with food that is 'good for you (nutritious and healthy), good for the planet (environmentally sustainable) and good for the farmer (viable and climate smart)'; that is our definition of Smart Food. Under the Smart Food movement, the International Crops Research Institute for the Semi-Arid Tropics (ICRISAT) has identified hidden resources (sorghum and millet crops), the burden challenge has been to make these cereals not merely popular but mainstreamed. Therefore, our methodology to achieve this has three parts: (i) Providing a scientific backing for the concept where criteria for a Smart Food are defined. (ii) Driving demand from consumers: this concerns creating awareness among consumers by revealing a 'buzz' around these foods. (iii) Ensuring that farmers benefit from the value chains of these products and engaged to maximize their benefits. Market research in rural and urban markets were conducted in Southern India, a TV reality Show was run in Eastern Africa, through a program of Smart foods Chefs and Ambassadors Fourteen Smart Food recipes have been produced of. Smart Food was taken forward as a partnership and many organizations have already teamed up to popularize millets. In Kenya, efforts have been initiated in rural areas to integrate Smart Food into messages by health workers and encourage new creative ways to cook with these crops. Through door-to-door sensitization of communities, 40,000 households have been reached with messages promoting consumption of diverse and nutritious food for improved health and nutrition. In addition, 2500 women were trained on healthy cooking and an additional 3000 were trained on nutrition education in Kenya. A social media campaign was launched in Mali with 473,222 persons reached in 2017. The Smart food campaign is making a difference on society and the environment thus contributing to a major impact on some of the leading global issues.
Keywords: Smart Food, diets, nutrition, diversity, malnutrition, hidden hunger, food system divide.

More drought, better food - drought effects on nutrient composition, a neglected climate change issue?

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Objective: Soil, inputs, and environmental factors such as weather control plant nutrient availability and nutrient content in food. Drought periods reduce photosynthetic activity but also affect nutrient bioavailability in soils. Nutrient transport within the plant and allocation of nutrients between organs of the plant is water dependent and therefore drought susceptible. The main research questions were: (i) Do droughts have an impact on the nutrient composition of food; (ii) Is there a difference in nutrient concentration in food based on its xylem and phloem mobility?
Methods: This study compared two regions Kapchorwa, Uganda and Teso South, Kenya that experienced drought during the second growing season in 2016. Maize (*Zea mays*) (n=62) and matooke (*Musa acuminata*) samples (n=90) in Kapchorwa, and maize (n=61) and cassava (*Manihot esculenta*) (n=64) in Teso South were collected during a normal season (March- July) and a drought season (October-December) of 2016. Crop samples were analysed using a portable X-Ray Fluorescence Spectrometer (pXRF) for P, K, Ca, Mg, S, Fe, Mn, Cu, and Zn content. The Standard Precipitation Index (SPI) was calculated using the TAMSAT weather database to compare drought intensity.
Results: The drought in Kapchorwa (SPI: -1.14 to -0.32) was more severe and began two months prior to Teso South (SPI: 0.09 to 0.55). Nutrient concentration in Kapchorwa decreased significantly from normal to drought season in both crops (Mean decrease: -38% for maize, -49% for matooke). In contrast, in Teso South nutrient concentrations increased significantly during drought season (Mean increase: 30% for maize, 23% for cassava). Nutrient phloem mobility seemed to play an important role in allocation of particularly micronutrients (Fe, Mn, and Cu), shown by their decreased concentration under severe drought in the crop parts collected (Fe: -67%; Mn: -81%; Cu: -89% in maize grain). Total nutrients accumulated in the edible parts were significantly higher in the normal than the drought season except for maize in Teso South, which showed an increasing trend of nutrients accumulated in the drought season.
Conclusion: Micronutrient contents (particularly Fe, Mn, and Cu) and yields of crops grown during drought-prone seasons were strongly affected, possibly leading to a double-burden for consumers through affected quantity and quality. Future research considerations should particularly focus on the nutrient increase during mild drought.

Dietary gaps in tropical Sub-Saharan Africa: prevalence and livelihood associations

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Efforts to estimate the prevalence of food insecurity and to understand its associations with rural livelihoods has been hampered by limitations in temporal and spatial representativeness of available data. Food balance sheets provide scalable estimates of chronic and hidden hunger, but fail to represent food access and its causal linkages. In contrast, rural household surveys represent detailed conditions for one or two points of time, but are influenced by survey timing and are often limited in geographical coverage. This study draws on a large sample of rural land-holding households in tropical SSA (n = 6,353) to estimate the prevalence of dietary gaps and to understand their associations with rural livelihoods and food sourcing behaviour. Dietary gaps were identified using diet diversity and food access indicators. Dietary diversity and channel of access (farm or purchased) was enumerated for the 'good' and 'lean' periods and food security of access was enumerated for the lean period only - making the results of this study independent of survey timing. As many as 38% of households were classified as severely food insecure (in terms of food access) in the lean period. Prevalence of gaps in micronutrient sources were high: 73% of household lacking daily sources of calcium, 42% lacking iron, 41% lacking thiamine, 55% lacking riboflavin, 44% lacking niacin and 81% lacking daily sources of vitamin B12 sources. Market participation, livestock product diversity, crop diversity gross income and off-farm income were all positively associated with energy, protein and micronutrient sources. These associations differed between agro-ecological zones. Households with a livestock component to their farm consumed more milk, meat and eggs; also having a lower prevalence of gaps in energy, protein and micronutrient sources. Our results suggest that increasing income will not necessarily result in improved diet diversity or healthy dietary choices. Therefore, interventions focused on income generation may need to compensate by promoting production diversity and by providing nutrition education. Our results also suggests that it is unrealistic or may even be counterproductive to try and shift overall diet diversity substantially. Rather it is more useful to target individual food groups that most benefit human nutrition.

Promoting indigenous and traditional food systems to combat the double burden of malnutrition brought about by hidden hunger

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Indigenous and traditional food system is inextricably linked to food sovereignty and rural development. For millennia, Indigenous and traditional food systems have provided rural communities with diverse, healthier, fresher, and more nutritious foods where communities had the autonomy/sovereignty to grow their own crops that are nutritionally and culturally appropriate to their population, creating a sustainable source of food with medicinal and cultural value, provide agro-tourism through conservation of agricultural biodiversity, and income to improve their quality of life, overcome the double burden of malnutrition, hidden hunger and economic well-being for all inhabitants of rural spaces, mainly peasants and indigenous populations. The nutrition success stories on the ground in developing and developed countries gathered by various stakeholders such as researchers, agricultural scientists, policy makers, NGOs etc have shed light and examined interventions that address nutrition directly, such as promoting indigenous and traditional food systems, community nutrition programming and feeding programs for infants and young children as well as nutrition sensitive policies related to agriculture, social protection, and clean water and sanitation, strong political will, effective strategic and program planning, and sustained integrated action, including the widespread mobilization of community-based volunteers, vaccination campaign, school feeding programs and healthcare, nutrition-sensitive effects of growth in the agricultural sector, along with improvement in sanitation, growing and eating nutritious diversified diets and improved soil fertility. Along the road indigenous and traditional food systems has been neglected or not prioritized while it is the one feeding the majority of the poor and marginalized global population of the world and has done a lot to combat hidden hunger and double burden of malnutrition. Since 2004,Kikandwa Environmental Association (KEA) has been working to improve the livelihoods of small-scale farmers and the sustainability of rural communities through the fostering of ecological land use management. It's against this background that KEA want to highlight the significant contribution to the socio-economic and cultural value of indigenous and traditional food systems and how it combat Wasting, Underweight, Obesity, Stunting etc which cause hidden hunger and the double burden of malnutrition during the congress.

What works to improve the health and nutritional status of children under-five in low and middle-income countries? Evidence from a systematic review and meta-analysis.

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Objectives: To determine the efficacy and effectiveness of micronutrient supplementation and fortification interventions for children under-five in low and middle-income countries (LMICs).
Methods: All applicable published and unpublished evidence was systematically retrieved and analyzed. Eligible studies included healthy male and female children from 1 month up to 5 years of age living in any LMIC who received one of the following preventative interventions: i) single (iron, vitamin A, iodine, zinc, vitamin D, folic acid, or vitamin B12) or multiple micronutrient supplementation, ii) lipid-based nutrient supplementation, iii) targeted fortification of infant formula or complementary foods, iv) large-scale food fortification, or v) point-of-use fortification with micronutrient powders. We included only primary studies of experimental and quasi-experimental design that allowed for causal inference. Primary outcomes of interest included all-cause mortality, cause-specific mortality, and nutritional status (anemia, stunting, wasting, underweight, overweight). Secondary outcomes included morbidity (lower respiratory tract infection, diarrhea), micronutrient deficiencies, growth, development outcomes (mental and motor), and adverse effects.
Meta-analyses will be performed separately for all quantitative outcomes and results presented as summary risk ratios or standardized mean differences and 95% confidence intervals.
Results: We retrieved 19940 unique references from our search; 2420 passed the title/abstract screening stage. After full text screening, 448 studies were included (preliminary results). Results are pending.
Conclusions: This large-scale review will answer the question of an intervention's biological (efficacy) and programmatic (effectiveness) potential for improving the health and nutrition of children under-five in LMICs. As such, the results of this review will be useful for policy and programming on a global scale.

How to cope with food price shocks? - Assessing children's nutritional status using blood-based biomarkers from Tanzania

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In response to surges in prices of staple foodstuffs, poor households often reduce dietary diversity to be able to afford energy-rich products. This is accompanied by increasing micronutrient deficiency having severe consequence for future health and wellbeing, in particular for young children. This study analyzes the effects of changes in staple food price on the nutritional status of women in reproductive age and under-5 year old children in Tanzania. In particular, we are interested in how the intra-household allocation of resources between mothers and children changes in response to an external shock, such as an increase in food prices. To avoid relying on self-reported consumption quantities of individual household members, the study makes use of a biomarker survey as part of the 2010 Demographic and Health Survey (DHS) in Tanzania to directly measure the effects on vitamin A and iron deficiency.

In our sample, about 20% of under 5 year old children are underweight and 40% show a deficiency in iron and vitamin A using dried blood samples and retinol-binding protein (RBP) and soluble transferrin receptor (sTR) as markers. As for women of reproductive age, 11% are found to be underweight, as well as 12% and 30% to have a deficiency in vitamin A and iron, respectively. Increases in staple food prices are positively associated with iron deficiency for both under 5 year old children and women, but underweight significantly increases in food prices only for women.

In economic theory of collective households, intra-household allocation of resources is determined by a so-called sharing rule which guarantees the pareto efficient allocation of resources for consumption goods according to the preferences of the decision makers. In a dynamic context, these preferences also represent how consumption today affects utility tomorrow. This study provides empirical evidence that an increase in food prices is positively correlated with relative calorie and vitamin A consumption of under 5 year old children (compared to the consumption of their mothers) indicating that higher food prices may reduce household consumption, but shift the intra-household allocation of resources towards children. Parents' rational behind buffering the consumption of young children may be the importance of children's contemporaneous consumption for their future ability to provide household labor and old age support to their parents.

Targeted microbiome correction by nutrition and pharmabiotics

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Introduction: Human microbiome determines our personal health, thus prognostic correction of its composition to expected functional activity by pharmabiotics and/or nutrition is a promising approach for prevention and treatment of noncommunicable diseases. Because of the uniqueness of microbiome of a particular person and its flexibility, the efficacy of such “medications” implementation depends on the level of personification in the selection of diet / pharmabiotics components.
Objectives: We have developed information system (IS) and began initial [pilot] testing of its beta-version for the adjustment of microbiome ratio correction in correlation with other biomarkers through the selection of ingredients rich in biologically active molecules (BAM) and for the design of nosology - and patient- specific pharmabiotics.
Methods: The IS operates with big data, in particular: i) patients anamnesis, medical examination results, ii) biomarkers, iii) microbiome representatives ratio for various diseases, iv) BAM of edible plants, v) influence of BAM, food ingredients, microorganisms on microbiome representatives ratio, vi) food composition databases, etc.
Results: Appropriate databases (DBs) have been created and a number of tools have been developed. Part of the DBs are arranged as relational DBs tables, others are organized through external DBs access. The IS has a friendly graphical interface for users allowing quick and easy individual data entry to perform personalized nutrition choices and recommend pharmabiotics.
Conclusions: Innovative algorithm has been developed for the selection of individually required contents from extensive data. Further development of the IS tool is oriented to precise diagnostics at earlier stages of diseases and improvement of individual recommendations by machine learning techniques.

Physico-chemical and sensory profile of the new papaya hybrid lines in Kenya

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The world is faced with a lot of challenges including lack of sustainable development and inability to feed its growing population leading to malnutrition. The issue of accessing high quality nutritious foods such as fruits has become a major challenge for many African peoples. Papaya (*Carica papaya* L.) is among the most grown fruit crops worldwide with high economic and nutritional value. In Kenya, the papaya industry relies heavily on imported varieties and farmers' selected seed whose quality is not known and its potential remain unexploited. Jomo Kenyatta University of Agriculture and Technology developed promising papaya hybrids whose physicochemical and sensory characteristics have not been evaluated. Therefore, the physical, chemical and sensory characteristics of the new papaya hybrids and their control, Sunrise Solo, were assessed using papaya descriptors, the standard AOAC methods and the 9-hedonic point scale. The results showed significant differences ($P< 0.05$) in fruit sizes among the newly developed papaya hybrid lines and the control, Sunrise solo with Line 4 having the longest and heaviest fruits. Fruits from Sunrise solo, lines 2, 3, 7 and 8 ranged from small to medium in size, while those of lines 4 and 6 were large. The total soluble solids (TSS) varied from 7.4 in Line 8 to 12.3% in Lines 5 and 7. The maximum and minimum Vitamin C content of 131.63 mg/100g and 52mg/100g were exhibited by line 6 and 8 respectively. Vitamin A content ranged between 1.69 and 3.39 mg/100g as exhibited by line 1 and lines 2 and 8 respectively. Hence, most newly developed papaya hybrids Lines showed traits that were comparable to or exceeded those of Sunrise and could be suitable for both local and export markets. This findings also shown that the new papaya hybrid lines can contribute to more than the DRA in vitamin A and C content. Thus, this information will increases awareness of papaya fruit consumption, resulting in healthier and decreased micro-nutrient deficiency prevalence and gradual reduction of diseases resulting from lack of diversified diets.
Keywords: Hybrids, Papaya fruits, sensory, Vitamins, fruit quality.

Gender discrimination; contribution to the "triple burden" of hidden hunger in south-west region of Cameroon

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Due to high gender marginalization and discrimination, most women in developing countries are faced with the problem of undernourishment and micro-nutrient deficiencies. Research was carried out to investigate the various forms in which women are discriminated upon and the effect on their health in some five communities in Cameroon. The research was first carried out in two phases; the first part was through physical survey and observation in homes and hospitals in five rural communities while the second phase was done through the sampling of 2500 questionnaires of 500 each in same five rural communities in Cameroon. Observation proves that women have greater needs for micro-nutrients as they contribute the huge number of patients in the hospitals and sick people in homes with even no financial means. Questionnaire results prove that women are deprived of being self reliant. They are solely dependent on their husbands and have little access to farming land and other resources. Most of the women work tirelessly for their husbands and manage their household with little micro-nutrient in food where priority of eating is giving to firstly to the husband and secondly children and most of the women end up eating just the remains which is undernourished and have little or no micro-nutrient. The most commonly recognized micro-nutrient deficiencies across all five communities in order of prevalence are lack of iodine, iron, calcium ,vitamin A D, B1 and B12 causing seventy percent of the women in rural communities with diseases of night blindness, beriberi, and scurvy, anemia, body weakness and joint pains. This has caused a significant burden on the affected gender both in terms of health costs and negative impacts in lost human capital and reduced economic productivity and has impaired the physical growth, limits productivity, and ultimately perpetuates poverty in these communities. We therefore recommend that the government should take a cohesive approach to confronting hidden hunger in women, by promoting gender inclusiveness in decision making and top put women in top rank position of administrations including agriculture, health, education, and regulatory affairs.

Seasonal food access as a pathway to the double burden of malnutrition: a case study of smallholder coffee farmers in Bolivia

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Bolivia experienced a significant reduction in poverty and improved its nutritional status in recent years. However, it remains among the poorest countries in South America where 19.8% of its population is undernourished, and the occurrence in obesity and non-communicable diseases such as cancer, stroke, and diabetes is on the rise (FAO, 2018). These conditions offer an interesting case to further study the double burden of malnutrition. Correspondingly, a significant portion of Bolivia's coffee farmers struggles to secure adequate food supplies at some point during the year, in what is referred to as seasonal hunger (Mendez, 2010). Although widely known, existing studies concerning this issue are cursory in linking fluctuating food access to dietary considerations and its impact on farmers' health and nutrition status. This study examined the magnitude of seasonal hunger and key contributing livelihood factors among 22 smallholder producers in Bolivia's most important coffee region, in order to analyze how recurrent fluctuation in food access effect farmers to adapt procuring strategies that predispose them to diets that offer a pathway to the double burden of malnutrition. The mixed method approach gathered data to understand socio-economic factors, analyze typical diets, document seasonal availability of foods for consumption and market activity, and identify coping strategies that offer insight on how farmers prioritize capacities to help reduce vulnerability. Utilizing the *SELFNutritionData* database we assessed and established a nutritional baseline to ascertain food security and its link to health dispositions. The evaluation found that seasonal hunger is influenced by several interrelated factors, including: (1) limited labor market (2) work burden among women (3) seasonality: coffee vs subsistence production (4) human-wildlife conflict (5) adverse climatic events (6) poor infrastructure (7) limited income. These challenges convene food coping strategies relevant to nutrition and health across the sampled household, characterized by the consumption of mainly energy-dense foods with low nutrient values, reducing meal portions, and skipping meals altogether. Preliminary nutritional analysis of the meals revealed deficiency in important micronutrients and elevated glycemic load levels. In addition, a disparity of overweight women compared to men was observed. Increased health risk lie in the transcendence of these coping strategies into adaptive ones.

Changing burden of underweight and overweight/obesity among rural Indian adults: a prospective cohort study of anthropometry surveillance data

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Objectives: To examine socio-demographic predictors of prevalence, incidence, and remission of underweight, and overweight including obesity (hereinafter overweight) among adult men and women (aged ≥18 years) in rural eastern India.
Methods: A prospective cohort study of anthropometry surveillance was conducted under the Birbhum Health and Demographic Surveillance System, West Bengal, India. Self-weighted sample of 24,115 adults (men: 10,915, women: 13,200) enrolled in 2008 were followed up for Body Mass Index (BMI) reassessment in 2017. Measured BMI was categorized as: underweight (18.5 kg/m^2), normal weight (18.5-22.9 kg/m^2), and overweight including obesity (≥23 kg/m^2; hereinafter overweight). Incident underweight and overweight was defined as transition from normal weight in 2008 to underweight and overweight in 2017, respectively. If underweight and overweight individuals in 2008 measured normal BMI in 2017, it was classified as remission from underweight and overweight, respectively. Multivariate logistic regression was applied to assess the predictors of prevalence, incidence, and remission of underweight and overweight.
Results: In 2008, 46.3% men and 46% women were underweight, whereas 10.1% of men and 14.6% of women were overweight. Incident underweight was 11.3% among men, and 10.3% among women, whereas remission among men and women was 32.8%, and 34.1%, respectively. Incident overweight was 19.0% among men and 27.2% among women, whereas remission of among men was higher (15.4%) than women (11.5%). Odds of remission from underweight were lower among educated people and people aged ≥36 years of age. Women were more likely to be overweight in 2008, and to experience incident overweight than men. For men and women, education level and wealth were positively associated with prevalence and incidence of overweight.
Conclusions: A nutrition transition to higher risk of overweight is evident in this rural setting in India, especially among women and individuals with high socio-economic status. At the same time, a high prevalence of underweight persists, resulting in a significant double burden. Culturally sensitive interventions that address both ends of the malnutrition spectrum should be prioritized.

Seed village programme: a practical approach for combating malnutrition and assuring nutritional security in arid zone

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Malnutrition is the biggest challenge in arid zone especially in rural areas and the most vulnerable are children, women and elderly especially of lower income groups. As these areas are severely affected with harsh weather conditions availability of proper diet and accessibility to balanced nutrients are the major hurdles towards healthy population. Under these conditions educating farmers for better avenues and latest techniques is the best option to meet the projected demand for food since crop production is constrained by erratic rainfall patterns. Keeping the above facts in mind KVK, CAZRI, Pali started the food awareness programme in its selected villages during 2015-17. A total of 600 demonstrations were laid on 200 hectare in 20 villages across six blocks of Pali district. Under this, quality seeds of improved varieties of prominent crops of the area namely Wheat (Raj 4037), Barley (RD 2035), Chickpea (RSG-888), Green gram (IPM 2-3), Mustard (Urvashi) and Sesame (RT-346) were distributed to the identified farmers. The crops were selected purposely as wheat and barley supply carbohydrates, chickpea and green gram provides proteins and mustard and sesame provides the fats needed for a normal diet for rural population. Also the concept of kitchen garden was introduced to fulfil the vitamins and mineral requirements. A number of trainings on scientific production technology to the identified farmers in the villages were also arranged for technology empowerment of farmers. In order to harness the synergy between technologies and the community participation, special emphasis was given to build farmer´s capacity to produce quality produce with regard to nutrition. The farmers adopted the concept and undertook the programme in operational area which showed a considerable spread of selected variety in nearby villages with a considerable improvement in nutritional status of rural population .From an initial start of 600 farmers the variety spread to 120 villages covering 860 hectares of area .Thus there is vast scope to produce and distribute quality seed in most crops for which seed village concept is a novel and highly practical approach and needs to be promoted to facilitate food grain production at village level in the geographical areas that are most affected by acute malnutrition. This concept also produced a significantly positive result and provided an opportunity to demonstrate the productivity potential of the latest technology for health.

An examination of patterns and distribution of overweight among children in South Africa

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Introduction: Obesity at childhood is associated with serious health issues and the risk of premature illness and death later on in life. Hence, it is important to monitor the related trends.
Objectives: The aim of this paper was to quantify the prevalence and trends of overweight and obesity in South Africa amongst under five years of age.
Methods: A cross-sectional analysis was done using data from the South African National Income Dynamics Panel Survey for 2008, 2012 and 2017. A total number of 3234, 3637 and 4526 were aged under five years for the respective surveys. Children with weight for height greater than 2SDs based on the World Health Organisation growth standard were classified as overweight.
Results: In 2008 it was observed that overweight was 13.2% (95% CI: 11.1%, 15.7%) which later increased to 17.1% (95% CI: 15.1, 19.4%) in 2012 and a decrease of 11.7%(95% CI: 10.2%, 13.4%) was observed in 2017 nationally. Overweight is more prevalent in children age 0-23months compared to those 24 -59months. Apart from 2017, the rate was higher for boys than girls in the other two years. For all three years, overweight was higher for Black than Coloured children. For all three years, overweight was higher in the urban informal in 2008 and 2012, while in 2017 it was high in the tribal areas compared to the rural formal and urban informal.
Conclusions: The findings indicated that between 2008 and 2012, the was a sharp increase in overweight by about 3.9%. Between 2012 and 2017, a sharp decrease of roughly 5.4% was observed. However, between 2008 and 2017, the was a slight decrease in overweight of approximately 1.5%. Looking at the period of 9 years (2008 to 2017) there have been a decrease in the rate of overweight though the change is very minimal. Therefore, there is need for effective intervention programmes that can help remedy the situation.
Keywords: overweight, obesity, children, South Africa