1. Conjugated linoleic acid isomers as anticancer bioactive compounds

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Introduction: Conjugated linoleic acids (CLA) are rumen conjugated isomers of linoleic acid associated with certain human health benefits, including anticancer properties, although the exact mechanisms are not clear yet.

Objectives: To determine, (i) antioxidative properties of two CLA isomers, cis9,trans11 (c9t11) and trans10,cis12 (t10c12), on microsomal lipid peroxidation compared to unconjugated 18-carbon fatty acids (FAs), and (ii) effect of these isomers on growth and survival indices of HepG2 hepatocarcinoma cells.

Methods: Microsomes were pre-exposed to c9t11 and t10c12 and 18-carbon mono- and polyunsaturated FAs. Lipid peroxidation was induced by iron and malondialdehyde formation measured as endpoint.

HepG2 cells were treated with c9t11, t10c12, linoleic acid (LA) and α–linolenic acid (ALA). Cell viability, proliferation and apoptosis were measured using the respective assays.

Results: Both c9t11 and t10c12 exhibited higher antioxidative properties than the polyunsaturated FAs, but less than monounsaturated FAs.

In HepG2 cells, c9t11 exhibited similar cell viability to ALA, whereas t10c12 was less cytotoxic and comparable to LA. Cell proliferation was decreased by ALA, c9t11 and t10c12, significantly greater than LA. Apoptosis-induction was comparable between LA, ALA and c9t11, while t10c12 had a significantly lesser effect.

Conclusion: The two CLA isomers differ in anticancer activity; c9t11 linked mostly to cytotoxicity and apoptosis, while t10c12 possesses a different mechanism mostly involving cell cycle arrest. A better understanding of the mechanistic action of specific CLA isomers would be prudent and economically beneficial in the promotion of relevant functional foods containing high amounts of CLA.

2. Effectiveness of a nutrition education intervention to improve knowledge, attitudes and practices regarding iron deficiency among mothers in Ghana

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Objective: The study assessed the effect of education intervention on knowledge, attitudes and practices (KAP) related to iron deficiency (ID) risks among mothers with young children in an anemia endemic population in Ghana.

Methods: A onceoff five-day educational intervention addressing KAP regarding ID, was designed from a baseline assessment, and implemented in July, 2013 among 70 mothers in Tolon-Kumbungu District with 70 mothers from Tamale Metropolis as control. KAP was assessed via questionnaires (test statements, preambles and open ended questions) in structured interviews at baseline, and repeated three months post-intervention.

Results: Post intervention, the intervention group compared to the control group, were more aware of dietary sources of iron, and reported improved KAP regarding the use of tea as a risk factor for ID. They also showed improved awareness of intra-uterine devices as risk factor for ID; and reported increased use of mosquito nets. Some misconceptions such as that standing in the sun for long hours cause anaemia were decreased in the intervention group. In the control community post-intervention a mother still believed that anaemia is given by God. None of the post intervention changes in KAP in the intervention versus the control group were however statistically significant.

Conclusion: Though exposure to a nutrition education intervention led to some improvement in KAP regarding ID risks among mothers in an anemia-prone area, changes were not statistically significant, indicating the need for longer term follow-up and refresher contact with the participants to deepen understanding.

3. Diet quality and nutritional status of children of female porters in a Ghanaian market

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Introduction: Maternal child feeding practices have implications for quality of diets and nutritional status of children.

Objective: To assess child feeding practices of female porters (locally referred to as kayayei), the diet quality and nutritional status of their children.

Method: In a cross-sectional survey, 50 kayayei mothers with children between the ages of 0 and 3 years were purposively selected and interviewed using a combination of methods. The data obtained were analyzed using the Statistical Package for Social Sciences (SPSS) version 18.0. Means and standard deviations were generated for continuous variables and frequency distribution for categorical variables.

Results: Most of the mothers (82%) fed their children three times or more a day, with majority (92%) relying on food vendors for their children's food. Foods fed to the children were mainly cereal-based. These foods were purchased due to their availability and affordability. Diets of 52% of the children were of poor quality, 40% had a fair quality diet whiles 8% had diets of good quality. Their mean weight-for-age, height-for-age and weight-for-height were -2.1 (± 0.45), -2.7 (± 0.86) and -2.1 (± 0.38) respectively. Ten percent of the children were underweight, 46% were stunted and 6% wasted.

Conclusion: The quality of the diets of the children was generally of not good quality, reflecting on the poor nutritional status of the children. There is therefore the need to target these mothers for nutrition education on good child feeding practices.

Keywords: Feeding practices, weight-for-age, height-for-age, weight-for-height, child nutritional status

4. Rural/urban differences in dietary intakes and nutrient adequacy among older people in Ibadan, Nigeria

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Adequate nutrition is essential for healthy ageing, however, malnutrition affects many older people. This study investigated rural/urban differences in adequacy of dietary intakes and its determining factors among older people in Ibadan.

This cross-sectional study involved 168 (urban) and 178 (rural) respondents. A semi-structured questionnaire was used to collect socio-demographic information, Dietary Pattern (DP) was assessed using frequencies of seven food-group consumption per week categorised as poor (0), average (1-3) and good (4-7). Direct weighing method was used for dietary assessment, energy and nutrient intake and nutrient adequacy were determined using adapted Total Dietary Assessment software. Data was analysed using descriptive statistics and Chi-square test at $p \leq 0.05$.

Respondents' ages were 68.9±4.7 years (urban) and 69.7±4.4 years (rural). Men constituted 58.9% and 60.1% in urban and rural areas respectively. Good DP for fruits (55.4%; 50.0%), vegetables (91.7%; 76.4%), animal foods (91.7%; 85.4%) and legumes (81.0%; 63.5%) were higher in urban than rural areas. Intakes of energy (1691.2±682.2; 1582.3±1145.0 Kcal), protein (69.4±31.2; 63.9±19.8 g), fibre (21.9±19.6; 18.9±9.4 g), vitamin B1 (2.2±3.2; 1.9±3.8 mg), calcium (255.8±241.4; 183.5±110.8 mg) and iron (17.0±9.0; 14.2±4.0 mg) were higher in rural than urban areas. Inadequate intakes of energy (61.3%, 52.2%), calcium (98.8%, 97.8%), zinc (82.7%, 71.9%) and vitamin B1 (51.2%, 44.9%) were higher in urban than rural areas respectively while protein (17.9%, 19.7%) and iron (5.4%, 7.9%) were lower.

Dietary pattern was better in urban than rural areas, however, intakes of energy and nutrients were lower. Location specific nutrition intervention programmes are necessary for Nigerian elderly.

5. Nutritional assessment of displaced adolescents

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Displaced adolescents constitute a vulnerable group without adequate food and health care. This study assessed the nutritional status of adolescent refugees in Oru Camp, Nigeria.

This cross-sectional study involved 72 adolescent refugees aged 12-19 years. A semi-structured questionnaire was used to collect socio-demographic information. Height and weight were measured to compute body mass index (BMI), mid-upper-arm-circumference (MUAC, cm) was measured on bare skin using flexible anthropometric tape and categorised as malnourished (<24) and well nourished (≥24). A 24-hour dietary recall was conducted for every third respondent while energy and nutrient intakes were evaluated against the dietary reference intakes (DRI) by calculating the percentage DRI met. Data was analysed using descriptive statistics.

Age of respondents was 14.58±4.21 years, 55.6% were males, 95.8% were students and 27.8% ate thrice daily. Mean height, weight, BMI and MUAC were 1.56±0.12 m, 46.31±9.38 kg, 18.79±2.8 kg/m^2 and 22.11±2.38 cm respectively. Using BMI, mild and severe underweight was 33.3% and 59.7% respectively, severe underweight was highest (13.9%) among 12-14 years age group and based on MUAC, 86.1% was malnourished. Mean intakes of energy (Kcal), protein (g), Ca (mg), Fe (mg), vitamins C (g), A (µg) and B12 (µg) were 1876±830.0, 59.1±31.7, 547.2±406.2, 12.3±8.3, 90.2±98.1, 33.25±50.1 and 7.54±10.8 respectively. Proportion of adolescents with adequate intake was energy (75%), protein (25%), iron (50%), vitamin C (50%), vitamin B12 (25%) and calcium (25%).

Dietary inadequacy and poor nutritional status is high among displaced adolescents. Nutritional care in emergency intervention in Nigeria needs to be intensified.

6. A comparative analysis of nutrition status in adolescents from an Urban versus a peri-urban School, KwaZulu-Natal, South Africa

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University of KwaZulu-Natal

Objective: The objective of this study was to conduct a comparative analysis of the anthropometric status of adolescents from an urban versus a peri-urban school in Hilton, KwaZulu-Natal

Design: Cross-sectional descriptive study

Setting: An urban and peri-urban high school in Hilton, KwaZulu-Natal.

Subjects: Grade 9-11 learners (n=111) aged 14 to 21 years from a peri-urban high school and an urban high school (n=98) aged 14 to 17 years who volunteered to participate (N= 209).

Results: Mean weight, height and mid-upper arm circumference (MUAC), indicate a higher prevalence of overweight and obesity among urban school boys than peri-urban school boys [(Weight: 74.97kg+16.63 vs. 59.83kg+8.22; $p<0.05$) (Height: 1.73m+0.06 vs. 1.65m+0.12; $p<0.01$) (MUAC: 31.79cm+5.59 vs. 26.50cm+2.78; $p<0.01$)]. Mean weight indicate a higher prevalence of overweight/obesity among peri-urban school girls compared to urban school girls (64.30kg+14.19 vs. 56.38kg+7.72; $p<0.05$). A higher prevalence of stunting was observed among peri-urban school boys and girls compared to their urban school counterparts (Height-for-age (boys): 0.163+ 0.912 vs. -0.707+ 1.207; $p<0.01$) (height-for-age (girls) -0.28+1.16 versus -1.22+0.74; $p<0.05$).

Conclusion: Results indicate that socioeconomic status and gender may play a role in obesity and stunting prevalence, as boys in urban areas and girls in peri-urban areas may be at a higher risk of overweight/obesity, whereas peri-urban boys may be at a higher risk of stunting. A double burden of stunting and overweight/obesity may also be present among adolescents in peri-urban areas with a low socioeconomic status.

7. Effects of iron supplementation on gut microbiota and gut inflammation: a randomised controlled trial in South African children

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Introduction: Iron supplementation is a common strategy to correct iron-deficiency anaemia in children, but it may modify the gut microbiota and increase risk for enteropathogenic infection.

Objectives: We studied the impact of iron supplementation on dominant bacterial groups of the gut, faecal short-chain fatty acids (SCFA), and gut inflammation in children in rural South Africa.

Methods: In a randomised, placebo-controlled trial of 38 weeks, iron-deficient 611 year-old children received either 50 mg iron/day (4 times/week) as oral FeSO4 (n=22) or identical placebo (n=27). In addition, iron-sufficient children (n=24) were included as a non-treated reference group. Faecal samples were analysed at baseline, 2 weeks, 12 weeks and 38 weeks on 10 bacterial groups, faecal SCFA concentrations and gut inflammation (faecal calprotectin).

Results: Bacterial concentrations, faecal SCFA and calprotectin did not differ between iron-deficient and iron-sufficient children at baseline. Iron supplementation significantly improved iron status in iron-deficient children and did not significantly increase faecal calprotectin. Moreover, no significant iron treatment effects or time x treatment interactions on bacterial groups or faecal SCFA were observed compared to placebo. Also, there were no significant differences in concentrations of any of the bacterial targets or faecal SCFA at 2 weeks, 12 weeks or 38 weeks between the three groups of children when correcting for baseline values.

Conclusions: Our study suggests that iron-deficiency and iron supplementation poses a low risk for negative modulation of the measured bacterial groups and/or adverse intestinal effects in African children from a malaria-free area with a low enteropathogen burden.

8. Quality of life as an outcome in nutrition research

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Background: Quality of life (QoL) is a subjective assessment of individuals well-being and an important outcome in health research. While laboratory and clinical tests assess changes in patients medical conditions, they do not capture the personal and social aspects of patients, which may affect adherence to treatment.

Method: Literature search was done (PubMed, CINAHL, and Medline Health Data Base) for studies published between January 2000 and 2014. Search terms used were nutrition, nutrition education/counseling, nutrition research, nutrition intervention, quality of life; combining the phrases with and, or.

Results: 175 titles were identified. 20 assessed QoL. The majority used the SF-36 QoL questionnaire. SF-36 is sensitive, simple, quick to complete, and allows for modification and cultural adaptation. SF-36 was developed from the Medical Outcome Study to measure aspects of health that are of universal importance. The mental health constructs of SF-36 were shown to have significant associations with measures of nutritional status, anaemia and clinical outcomes in haemodialysis patients. SF-36 was also reported as a good instrument for describing relationships between CD4 cell count, viral load and health status.

Conclusion: QoL measurement has been established to have significant associations with measures of nutritional status and clinical outcomes. It may detect higher risk of morbidity and mortality. It is a sensitive instrument to measure change during intervention, and can therefore be considered to measure change and programme effects in nutrition intervention studies.

9. Marketplace servings of fresh South African chicken products

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Introduction: Chicken meat increasingly accounts for a large percentage of meat products produced and consumed in South Africa. It is however difficult to quantify the nutritional contribution of fresh chicken meat to the diets of South Africans, or recommend healthy portion sizes, as limited data exist on the physical composition of available products (marketplace servings).

Objectives: The study objective was to determine the physical composition of fresh chicken portions, in order to translate the South African food-based dietary guidelines (FBDG) into easily understandable market place servings.

Methods: Samples (n=6x4) of fresh South African chicken cuts (drumsticks, thighs, wings and breasts), were procured from three major retailers in Gauteng, South Africa. Each sample was dissected into bone, skin, dissectible fat and meat, to determine edible- and lean edible portions per marketplace serving. Data was analysed using Genstats (2013). A review was done on various dietary recommendations for animal source foods, specifically chicken. Physical composition was used to translate these recommendations into marketplace serving quantities.

Results and discussion: Previous South African dietary recommendations stated a chicken serving as 100-115g (raw), whereas the revised FBDG recommend up to 90g of cooked lean meat per day (110g raw). Edible portions ranged between 40g (wings) and 220g (breasts). Lean edible portions ranged from 20g (wings) to 180g (breasts).

Conclusion: These findings will be used towards developing serving size guidelines for chicken.

10. Implementation of The *Road-to-Health Booklet* in PHC facilities in the Western Cape province

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Stellenbosch University

Background: The *Road-to-Health Booklet* (RtHB), a standardised national tool for health status assessment of children, was introduced in February 2011.

Aims: To evaluate the implementation of the RtHB in the Western Cape Province.

Methods: A proportional stratified sample of Primary Health Care (PHC) facilities was surveyed. RtHBs of children (0-36 months) were assessed and caregivers (CG) interviewed. Healthcare workers (HCWs) completed a self-administered questionnaire and consultations were observed.

Results: Data was collected from 2481 infant-CG pairs and 270 HCWs from 143 facilities. The average age of the children was 6.96 ± 6.24 months (0.06–34.15). The majority (62%) of CGs knew the purpose of the RtHB, but only 31% understood the content. Although 86% of CGs were comfortable with the recording of HIV/TB information, maternal HIV status was omitted from 43% of booklets. All HCWs indicated the importance of health promotion messages (HPM), but only 49% communicated HPM during consultations. No HPM were communicated to CG >50% of times in 4/6 districts. The majority (95%) of children was weighed, but few heights, mid-upper arm and head circumference measurements were performed (16%, 20% and 14% respectively). This could explain why, although 69% of HCW could correctly identify underweight, only 55% and 39% could do so for stunting and wasting respectively.

Conclusion: Many implementation aspects of the RtHB need strengthening. Attention should be shifted from performing tasks only, to accurate, early identification and documentation of at risk children, as well as appropriate action. Ongoing training, motivation and monitoring of HCWs are imperative.

11. Investigation of consumers' awareness, understanding and perceived health benefits associated with the Heart Mark logo in South Africa: A pilot study

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Background: Preventing NCDs is important and several strategies have been employed to target at-risk populations. One strategy is front-of-pack logos on food products which aid consumers in making informed and healthful food choices. This study aims to investigate consumer awareness, understanding and perceived health benefits associated with the Heart and Stroke Foundation of South Africa (HSFSA), Heart Mark logo.

Methods: Four stores were chosen according to the living standard measure (LSM) of their target market. Participants were categorised into low, medium and high LSM. A convenient sample of 301 participants completed an in-store questionnaire designed for this study. Cross-sectional information on consumers awareness, understanding and the perceived health benefits associated with the HM logo was collected. Participants health consciousness was documented on a Likert scale.

Results: Majority (89%) were aware of the HM logo and this was consistent across LSMs, sex, ethnicity, age, education level and marital status. The majority associated the logo with food items providing some health benefit. Factors influencing the purchase of food items bearing the logo included price, personal health and taste. Trust and credibility in HM products was significantly higher in middle and high LSM groups. Health benefits associated with the HM were improving general wellness and lowering blood pressure. Health consciousness and purchasing HM products was significantly higher in high and middle LSM groups.

Conclusions: More awareness and promotion of the HM logo, particularly among lower socio-economic groups is needed. Front-of-pack logos may be an effective tool as part of other prevention strategies.

12. Food safety and risk modelling among South African maize consumers

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Introduction: Food contaminated by mycotoxins, produced by food-borne fungi, is a global food safety and public health priority. South African maize is known to be contaminated by mycotoxins such as fumonisins (FB), deoxynivalenol (DON) and zearalenone (ZEA). Chronic exposure may incur adverse human health outcomes or possibly exacerbate other existing disease conditions.

Objectives: The differential risk of multi-mycotoxin exposure among South Africans residing in nine Provinces was assessed during a national cross-sectional grain consumer survey. The relative per capita maize intake (g/day) was stratified by gender, ethnicity and Province and the probable daily intake (PDI) for each mycotoxin (µg/kg body weight/day) calculated utilising SPECIAL and SUPER dry milled maize fractions representing different exposure scenarios.

Results: Men consumed on average more maize (173 g/day) than women (142 g/day) while the black African ethnic group had the highest intake (279 g/day) followed by the Coloured group (169 g/day) with the Asian/Indian and White groups consuming lower quantities of, 101 and 80 g/day, respectively. The mean PDIs for the various subgroups and Provinces were below the provisional maximum tolerable daily intake (PMTDI) for each mycotoxin. The development of a unique mycotoxin risk assessment model (MYCORAM) for exposure, stratified by Province and ethnicity utilising specific maize intake increments (g/kg body weight/day), were more sensitive than the PDIs and provided information on the percentage of the population exposed above the PMTDI for each mycotoxin.

Conclusion: Safety modelling using the MYCORAM could predict maximum tolerated levels adequate to safeguard South African maize consumers including vulnerable subgroups.

13. Cereals food group update - one food group closer to a country-specific food composition database for South Africa

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Introduction: The vision of the South African Food Composition Data System is to maintain a country-specific food composition database. There are16 food groups available at present. The aim of this project was to update and include new nutrient information to the Cereals food group.

Objectives: To introduce new recipe calculation methodology to recipe foods. To identify the challenges experienced when reaching out to food industry in South Africa.

Method: Email outreach to Cereals food industry for new nutrient information. Recipe calculation methodology improved using raw ingredients, yield and retention factors to predict nutrient content of recipe foods. Yield and retention factors sourced from American reference sources and applied to local recipes. Challenges to progress recorded.

Results: A response rate of 50% achieved from food companies targeted. Total number of Cereal food items increased by 74%, inclusive of an 82% increase in South African analysed products and 132% increase in recipe-referenced food items in the group, when compared to the previous edition of Cereals food group. American and British reference sourced food items reduced by 86% and 66% respectively following update. Challenge when sourcing yield factors for typical South African recipe foods occurred (n=22, 17%). Lobbying at local food industry level for nutrient data showed lack of interest from companies (sample size=9).

Conclusion: Need identified to generate country-specific yield factors to eliminate assumptions made when completing recipe calculation methodology within food group. Nutrition advocacy is imperative at government level to strengthen public-private partnerships to improve country-specific food composition database.

Keywords: Food composition, country-specific database, cereals, recipe, yield, retention, food industry

14. Food access, diversity and nutritional status of rural resource-poor households? The troubling coexistance of food insecurity and obesity

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Introduction: Despite national food security, more than half of South African households experience hunger or risk of hunger with rural households more severely affected because of limited livelihood opportunities and higher food prices compared to urban areas.

Objectives: This study assessed food and nutrition security of rural resource-poor households in two Northern Cape Province communities of Vaalharts.

Methods: In 2013, 79 households were assessed (cross-section design) involving 33 male and 115 female inhabitants (aged 10-88). We used a household food insecurity access scale (FANTA, 2007), BMI measurements, and a 12 score individual dietary diversity questionnaire (FAO, 2013).

Results: Most households were categorised severely (63.3%) and moderately food insecure (24.1%) in terms of insecure access to food, resulting in hunger, limited quantity and diversity of foods. On average, household members consumed 2.8 meals, 0.8 snacks and 5 food groups per day. Individual food group consumption reflected mostly starchy staples (99.2%), sugar and sweets (incl. sugary drinks) (76.7%) and meat (62.4%). Age correlated negatively with the number of snack times during the day ($r=-.256$, $p<.01$). These comprised mostly sugar and sweets (84.6%), fruits (56.9%), and savoury snacks (41.5%) consumed primarily by adolescents. High rates of overweight (22.4%) and obesity (27.9%) were found, affecting predominantly adult women.

Conclusion: Rural households were exposed to high food insecurity and low quality diets, yet reflected high rates of overweight/obesity and unhealthy snacking among adolescents. The high overweight/obesity prevalence in such food insecure households needs urgent research and policy attention.

15. "Pass the salt": a reception analysis of the Heart and Stroke Foundation South Africa's salt education messages

Christelle Crickmore
Heart and Stroke Foundation South Africa

Introduction: High salt intake is an established risk factor for hypertension, both largely prevalent in South Africa. The Heart and Stroke Foundation South Africa (HSF) plays a leading role in public health education and a recent campaign in 2013 included education on salt and health.

Objectives: To evaluate how case study participants perceived and decoded the HSF messages compared to the intended message (encoding) and whether there is an intended behavioural change based on exposure to the messages.

Methods: Qualitative research in the form of a reception study was conducted amongst four isiZulu-speaking women in Umgeni Park, KwaZulu-Natal. A semi-structured interview, research questionnaires and a focus group discussion provided the data set that was analysed by thematic analysis.

Findings: One of the three key messages was decoded in accordance with the intended meaning. Participants understood that salt intake adds up quickly during the day as one consumes many meals that are high in salt. Participants reported an intention to change behaviour, but a lack of power to affect change was identified due to affordability of foods lower in salt and the low efficacy of the message (not providing tools to reduce salt intake).

Conclusions: The findings confirmed that a culture-centred approach to health communication is essential. Culture and environment of both the receiver and sender of messages influence the decoding thereof. It is therefore imperative to include the priority audience of future salt communication campaigns during message development, subverting the power of the experts and strengthening the voice of the marginalised.

Keywords: salt, health communication, messages, behaviour change, culture-centred approach, Heart and Stroke Foundation South Africa.

16. Comparison of resting energy expenditure in black and white male runners

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Self-employed

Introduction: Dietitians in sport nutrition need to estimate athletes' energy requirements yet few predictive equations are available for this group. At the same time international literature suggests race/ethnic differences in resting energy expenditure (REE).

Objectives: To compare REE in black and white male runners aged 18-60y and compare the measured REE to REE estimations from three existing predictive equations.

Methods: REE was measured with QUARK RMR indirect calorimetry in black (n=32) and white (n=49) male runners (mean age 37.2 ± 9.4). Body composition was determined through multifrequency bioelectrical impedance analysis (Bodystat Quadscan 4000). Statistical analysis compared the race/ethnic groups with respect to REE using analysis of covariance (ANCOVA) with covariates lean body mass (LBM) and age. Level of significance was set at $p<0.05$. Ethical clearance was obtained.

Results: There was a non-significant difference in REE between black (7 017 kJ ± 1 037kJ) and white (7 393 kJ± 1533kJ) runners ($p=0.207$). Equally, there was no difference in LBM ($p=0.220$) and the estimated REE between black and white male runners for the predictive equations: Harris Benedict ($p=0.420$), WHO ($p=0.470$) and Cunningham ($p=0.220$). On the other hand, percentage body fat, fat mass and height differed significantly ($p=0.002$, 0.043 and 0.0001 respectively).

Conclusion: REE, lean body mass and the predictive equations did not differ between black and white male runners, meaning race/ethnicity differentiation in energy prescriptions cannot be recommended at this stage.

Keywords: Resting energy expenditure, runners, race/ethnicity, lean body mass, body fat percentage, body composition.

17. Linking food regulatory environment with food guidelines: A South African case study

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Clover SA

Introduction: The publication of new food labelling regulations in 2010 dramatically changed the face of food products in South Africa. The food legislation landscape in South Africa is complex yet integrated, with numerous regulations from various governmental departments applying to one food product. In 2013 the South African government also released the Food Based Dietary Guidelines (FBDGs) to serve as a guideline to a prudent diet.

Objectives: To determine the legislative landscape applicable to South African food products and the effect of the different regulations on consumer knowledge.

Method: A comprehensive study of all legislation (compositional and labelling) applying to SA food products was done using maas (cultured milk), a primary dairy product, also included in the FBDGs, as a case study. A comprehensive nutritional analysis of commercially available maas was also performed.

Results: The integrity of maas, as a primary dairy product, is protected by the prohibition of the addition of additives, keeping the product in its most uncontaminated form. The nutritional composition of maas shows it to be a nutritionally adequate food, rightfully included in the FBDGs. However, labelling legislation (R146) prohibits the use of functional nutritional claims on food products, including maas.

Conclusion: Maas, is seen as an integral part of a prudent diet due to its natural composition and nutritional properties. However due to a lack of legislation governing functional nutritional claims for food products, the consumer cannot currently be educated on the health benefits of maas on the packaging (at the point of purchase).

18. Creating healthy and appealing restaurant meals – what do people want?

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Unilever

Background and objectives: Overweight and obesity are global public-health problems that are dramatically increasing and unhealthy restaurant meals are a contributing factor. Hence, Unilever developed Seductive Nutrition™, a programme to seduce dinners with delicious and nutritious foods by making small changes to meals and making them appealing. This programme has launched successfully, however, to further this approach an understanding of what guests want and barriers to choosing healthy meals is required.

Methods: A population-representative sample of 500 South African participants completed an online questionnaire. Respondents were aged 18-64, 50% of the population was female and they ate out of home at least once per week.

Results: Two-thirds of South African guests wanted healthier options when eating out and only 17% were completely satisfied with current healthy options. Almost half felt that healthier options were less tasty and not value for money or satiating. They wanted to see the following included in restaurant options to make them healthier: steamed, baked or grilled options, healthier side dishes, plenty of vegetables and fresh ingredients.

Conclusions: South African guests were largely unsatisfied with current healthier options and identified small changes that could help them choose healthier meals, including preparation techniques and inclusion of healthy ingredients. Guests also identified taste, price and satiation as barriers to choosing healthier meals. This highlights a role for nutrition experts to develop suitable recipes to drive behaviour change in South Africans eating out of home. Restaurants can then leverage these insights to provide healthier, appealing meals to guests.

19. Association between fibrinolysis markers and body composition in black adults in North West, South Africa

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North-West University

Introduction: Plasminogen activator inhibitor type-1 (PAI-1) and clot lysis time (CLT) are markers of fibrinolysis. PAI-1 has a known relationship with central obesity. Preliminary evidence shows that the relationship of CLT with obesity may differ from that of PAI-1 with obesity.

Objective: To investigate the association between fibrinolysis markers and body composition in the South African Prospective Urban and Rural Epidemiology (PURE) study data collected during 2010.

Methods: Data from 1288 eligible adult black South-Africans in the North-West Province were cross-sectionally analysed. Height, weight, hip circumference, waist circumference and skinfolds were measured. PAI-1act and CLT were analysed.

Results: PAI-1act associated stronger with central obesity while CLT associated stronger with total body fat. In women PAI-1act and CLT showed different associations with body composition, whereas associations of PAI-1act and CLT with body composition were similar in men. CLT showed a linear relationship with body composition where PAI-1act levels plateaued at higher body composition categories.

Conclusion: Observed differences may be related to differences in adipose tissue type, distribution and sequence of accumulation between genders. PAI-1act is strongly influenced by accumulation of visceral adipose tissue (VAT) whereas CLT is associated with obesity independent of type and sequence of body fact accumulation. Preferential accumulation of VAT in men may explain similarities in the relationship of fibrinolysis markers with body composition. Proportionally less VAT, but more subcutaneous adipose tissue in women may explain observed increase in CLT compared to PAI-1act levels that plateaued over body composition tertiles and categories.

20. Anthropometric status, dietary intake and vitamin A status of South African preschool children from four areas with diverse eating patterns

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Medical Research Council

Introduction and Objectives: Against the background of a national vitamin A supplementation (VAS) programme, mandatory fortification of wheat flour and maize meal and regional differences in dietary habits, this study determined anthropometric status, dietary intake and vitamin A status of children in four diverse resource-poor geographical areas.

Methods: Preschool children were randomly selected from two rural (n=140 and n=206, respectively) and two urban (n=194 and n=207, respectively) areas. Height and weight measurements were taken. VAS history was extracted from the Road-to-Health card. The caregiver was interviewed using a 24-hr dietary recall. Blood samples were analysed for serum retinol; C-reactive protein and α1-acid glycoprotein were measured as indicators of inflammation.

Results: Stunting ranged from 13.9% to 40.9%; and overweight from 1.2% to 15.1%. Having received a high-dose vitamin A supplement during the preceding six months ranged from 3.0% to 44.2%. Maize meal porridge was consumed by 81.0–97.6% rural and 31.1–59.7% urban children on the recall-day, and bread by 48.8– 63.8% rural and 62.3–71.4% urban children. Fortified bread and/or maize meal provided 122–160 µg RAE vitamin A in rural children and 65–79 µg RAE vitamin A in urban children. Serum retinol < 20 µg/dL was prevalent in 8.2–13.6% children (2.1–6.6% when adjusting for inflammation).

Conclusion: Prevalence of vitamin A deficiency was lower than national figures, with no difference across areas despite differences in dietary intake and VAS coverage. Rural children benefited more from the national food

fortification program. Anthropometric status varied, highlighting a need to target nutrition interventions across geographical areas.

21. Psychosocial support and constraints to dietary compliance of type 2 diabetes patiens in Ibadan, Nigeria

Grace Fadupin, Adesanjo Oyejide
University of Ibadan

Introduction: Psychosocial support and dietary compliance are crucial to treatment outcome of patients with diabetes.

Objective: To evaluate the psychosocial support and constraints to dietary compliance of type 2 diabetic patients in Ibadan, Nigeria.

Methods: A descriptive cross sectional study was carried out among 290 adult diabetic patients attending two major hospitals in Ibadan. Structured, interviewer-administered and modified diabetes social support and satisfaction with life questionnaires were used to collect information on socio-demographic characteristics, social support and psychosocial constraints to dietary compliance of the patients. Data was analysed using descriptive statistics and Spearman correlation to determine the association between psychosocial support and dietary compliance of the patients.

Results: Mean age of the patients was 52.59±9.2 years, 12.4% were unemployed and 21.9% had monthly income <30,000 naira. Most (61.8%) of the patients mainly depend on their children for financial and medical support. Majority (83.4%) felt sad due to the burden of the illness. Only 37.0% and 4.0% adhered to dietary instruction and dietician appointment respectively. Significant positive association was observed between psychosocial support and dietary compliance of the patients ($r=0.265$, $p<0.05$).

Conclusion: Dietary compliance among the type 2 diabetic patients was positively influenced by psychosocial factors such as low income of the patients and financial dependency on their children.

Keywords: Psychosocial support, psychosocial constraints,dietary compliance, type 2 diabetes, Ibadan

22. Quality of life and nutritional status of the elderly in Ibadan, Nigeria

Grace Fadupin, Esther Ijeh
University of Ibadan

Introduction: Quality of life and nutritional status are important measures of the well-being and health status of individuals.

Objective: To assess the quality of life and nutritional status of the elderly in Ibadan, Nigeria

Methods: A community base, descriptive cross sectional study was conducted among 240 elderly age >60 years using multistage sampling technique. Nutritional status was assessed using the Body Mass Index (BMI) and the quality of life was assessed using World Health Organization Quality of Life (WHOQoL-BREF) questionnaire. Data were analysed using descriptive statistics and chi square test.

Results: The mean age of the elderly was 69.7±8.1 years, 53.3% were females, 63.3% were living with their spouses and 60.0% had no formal education. The overall mean quality of life was 54.3±14.2% while 17.9%, 50.4% and 31.7% had high, moderate and low quality of life respectively. Half (48.6%) had normal BMI while 6.7%, 35.4% and 15.8% were underweight, overweight and obese respectively. The physical health ($p=0.011$), psychological health ($p=0.001$), social relationship ($p=0.021$), environmental health ($p=0.027$) and nutritional were significantly related with the overall quality of life of the elderly.

Conclusion: Majority of the elderly had poor quality of life and poor nutritional status.

Keyword: Quality of life, nutritional status, elderly, Ibadan, Nigeria

23. Assessment of food intake and nutritional status of mothers and their under-five children in Ibadan south-east local government area, Oyo State

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University College Hospital, Ibadan, Oyo State, Nigeria

Introduction: The study was conducted to assess the food intake and nutritional status of mothers and their under five children in Ibadan South East Local Government Area, Oyo State, Nigeria.

Methods: Data on socioeconomic characteristics, anthropometry, dietary habits, personal hygiene and breastfeeding practices were obtained using structured questionnaire. Information on food intake was obtained using a 24-hour dietary recall of mothers. Weight and height were measured to determine Body Mass Index (BMI) while the length/ height and weight were used for assessing nutritional indices for children. The anthropometric measurements of children were analyzed using WHO Anthro 2005 software.

Results: The nutritional status of mothers showed 57% of mothers normal, 8% underweight, and 25% overweight while 11% obese. Among their children 53% stunted, 22% underweight while 20% wasted. About 10% of the mothers were found to practice exclusive breastfeeding. There was a significant ($p\leq0.05$) association between mothers' practice of exclusive breastfeeding and nutritional status of children ($X^2=7.83$). The correlation analysis showed positive correlation but not significant between body mass index and age ($r=0.39$, $p=0.21$), body mass index and education ($r=0.29$, $p=0.37$) while the relationship between body mass index and income was significant ($r=0.10$, $p=0.001$).

Conclusion: This study has established a high prevalence of stunting, wasting and underweight amongst under five children in the study area. It is therefore recommended that nutrition education should be encouraged, more awareness given to care and hygienic practices and adequate food-intake for mothers.

24. Claims on the labels of foods consumed by infants and young children in two African countries: Assessment and Research in Child Feeding (ARCH)

Alison Feeley, Catherine Pereira, Rosalyn Ford, Lara Sweet, Jane Badham
Consultant

Objectives: To compare data from two African countries, part of the global ARCH labelling study, on types of claims made on commercially produced complementary foods, and to compare them to claims made on foods commonly fed to children <2 years of age. These results are intended to inform the current global discussion on the inappropriate promotion of foods for infant and young children (IYC).

Methods: A cross-sectional study conducted in Senegal and Tanzania whereby the labels of commercially produced foods marketed to (CPCF) and/or commonly fed to children <2 years (CPF) were compared and assessed against international guidance and current practices were defined.

Results: For CPCFs the majority of claims in Senegal were nutrient content (44%) or non-nutrition claims (42%) whereas in Tanzania the majority of claims were nutrient function/other function/implied health claims (38%) or non-nutrition claims (31%) Of the CPF claims made among the Senegal sample, the majority (50%) related to non-nutrition claims, followed by nutrient content (37%) and nutrient function/ other function/ implied health claims (13%) whereas in Tanzania the majority (43%) related to non-nutrition claims, followed by nutrient content (30%) and nutrient function/ other function/implied health claims (27%).

Conclusions: More WHO guidance is needed regarding the appropriateness of claims on all foods consumed by IYC in order to support optimal nutrition and such guidance should consider restrictions on appropriate commercially produced complementary foods do not result in unintended negative consequences such as caregivers selecting other foods which have fewer claim and promotion restrictions.

25. Nutrient composition and cost comparison of products consumed by infants and young children in two African countries

Alison Feeley, Rosalyn Ford, Katie Pereira, Lara Sweet, Jane Badham
Consultant

Introduction: Infant and young child nutrition is receiving international attention, particularly commercially produced complementary foods.

Objectives: To compare data from two African countries, part of the global ARCH labelling study, on the nutrient composition and cost differences between commercially produced complementary foods (CPCFs) and commercially produced foods (CPFs) for general consumption commonly fed to children <2 years. The ARCH results are intended to inform the current global discussion on the inappropriate promotion of foods for infant and young children (IYC).

Methods: A cross-sectional study conducted in Senegal and Tanzania whereby the nutrient composition (as denoted on their labels) and price of CPCFs and CPFs were assessed and compared to relevant DRI/RNI per 100 kcal portion.

Results: A higher proportion of CPCF labels provided nutrient composition information than CPFs (69-87%) vs (23-41%). Macronutrient composition was similar among the three sub-categories of CPCFs (cereals, homogenised foods and snacks) and per 100 kcal portion contributed between 18-50% of energy, 28-40% of protein and 26-90% of carbohydrates. Key micronutrients (calcium, iron, vitamin A) provided 20-30% per portion. However this was in contrast to CPFs which generally contained similar energy and carbohydrates but were inadequate in terms of key micronutrients. Of concern, for both categories of foods was that sugar was relatively high and contributed 80-900% of the current PAHO daily recommendation.

Conclusions: Inconsistent nutrient composition data is provided by manufacturers. CPFs were cheaper than complementary foods. This may result in mothers/caregivers choosing products not specifically formulated for a growing infant's needs.

Keywords: infant feeding.

26. Nutrition knowledge on cancer prevention amongst undergraduates of University of Ibadan, Nigeria

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University of Ibadan

Background: Cancer is a preventable and potentially avoidable disease. Mainly, by tackling modifiable risk factors, but there are still gaps in knowledge on this in many developing countries.

Objective: To assess the nutrition knowledge and dietary pattern of undergraduates at the University of Ibadan on cancer prevention.

Methods: Cross sectional survey done, involved 367 undergraduate students of University of Ibadan, Nigeria, between June-November 2013. Self-administered semi-structured questionnaire was used to collect information on demography and nutrition knowledge on cancer prevention based on literature. Dietary pattern was assessed with food frequency questionnaire and anthropometry was done. SPSS version 17.0 was used for data analysis. Descriptive statistics and chi square analysis were done, level of significance was set at $p<0.05$.

Results: Mean age, weight, BMI, waist and hip circumferences were 21.9±3.0 years, 59.3±9.5 kg, 21.8±3.0kg/m^2, 75.3±6.3cm, 91.3±6.7cm respectively. Less than half (41.4%) had good nutrition knowledge on cancer prevention. Only about 40.0% consumed legumes/nuts, fruits and vegetables frequently. Significant difference was observed between nutrition knowledge on cancer prevention and frequent consumption of cereal, legumes/nuts, meat, fish, eggs, poultry and snacks and sugary drinks ($p<0.05$). No significant difference were observed in cancer prevention knowledge and frequency of consumption of fruits and vegetables, roots and tubers, milk and its products ($p>0.05$). Infrequent consumption of legumes/nuts, fruits and vegetables were associated with high risk of abdominal obesity, $p<0.05$.

Conclusion: Nutrition interventions to improve knowledge and dietary practice on prevention of cancer are needed in Nigerian students.

Keywords: Cancer prevention, Nutrition Knowledge, Dietary practice

27. The often neglected but critical component - stakeholder analysis and engagement: Using the "Assessment and Research on Child Feeding" (ARCH) Project as a case study

Rosalyn Ford, Jane Badham
JB Consultancy

Introduction: Using research findings to inform policy change is dependent on the assessment and early engagement of all relevant stakeholders and an understanding of their knowledge and attitudes towards the issue. This requires a planned assessment and subsequent engagement strategy for each stakeholder, together with ongoing interaction and communication in a structured manner. Unfortunately stakeholder engagement often mistakably receives little attention and priority in the process of translating research into policy.

Objective: To demonstrate the importance of stakeholder analysis and implementation of advocacy plans in any research designed to inform policy, using the experience of the ARCH Project in four countries.

Methods: A systematic stakeholder analysis tool adapted from Schmeer (2000) was used to identify and interview relevant stakeholders in the four ARCH countries. Stakeholders were grouped according to priority and importance and were further classified using the Daly (2011) knowledge-feeling matrix. Individual and group advocacy plans were developed and implemented to support the research process and findings.

Results: Up-front, comprehensive stakeholder analysis and early engagement is critical for acceptance and translation of research results into policy shaping outcomes. Important factors include power and leadership capacity and knowledge and attitudes towards the specific policy being addressed. Developing and undertaking a structured advocacy plan for individuals and groups of stakeholders improves the likelihood of success. **Conclusion:** Neglecting to undertake a thorough stakeholder analysis and developing and implementing a comprehensive advocacy plan could result in failure of important research findings being translated into positive policy changes.

Keywords: stakeholder, advocacy, policy

28. Fatty acid status and dietary intake of South African children and their caregivers from three communities with distinct dietary patterns

Rosalyn Ford, Marius Smuts, Mieke Faber
JB Consultancy

Introduction: Dietary fat intake particularly its quality is reflected in the red blood cell (RBC) fatty acid (FA) profile and is vital in growth, development and health maintenance.

Objective: To assess the FA profile (%) of RBC membrane total phospholipids in relation to the dietary intake of children and their mothers/caregivers from three communities.

Methods: Children, aged: 2-5 years and their mother/caregivers were selected from De Aar (DA) (n=105), Ocean View (OV) (n=93) and Sekhukhune District (SD) (n=104). The RBC membrane total phospholipid FA profile was determined by gas chromatography and dietary intake determined by a 24-hour recall. Dietary intake medians were compared by Kruskal-Wallis test. RBC FA means were compared through an analysis of variance (ANOVA) and a Bonferroni post hoc test.

Results: DA and OV's children and mothers/caregivers' total dietary fat, saturated FA (SFA) and polyunsaturated FA (PUFA) intakes were significantly higher than SD ($p<0.05$). Omega-3 FA dietary intake was lower than recommended in children and mothers/caregivers from all three sites. DA and OV's SFA intake was higher than recommended. SFA percentage of the RBC membrane FA profile in both DA's children and mother/caregivers and OV's mother/caregivers was significantly higher than SD. SD's PUFA and omega-3 FA percentages were significantly higher.

Conclusion: Differences particularly between DA and OV and SD were observed in dietary fat intake and the RBC membrane FA profile. Dietary omega-3 FA intake was low in both groups from all three study sites and is of concern.

Keywords: Diet, fatty acids, red blood

29. Dietary intake, alcohol consumption and exercise patterns among NMMU students

Annelie Gresse, Ingrid Oxley-Oxland, Jacques Pietersen
Nelson Mandela Metropolitan University

Introduction: Inadequate information was available regarding the lifestyle of the approximately 23 000 students at Nelson Mandela Metropolitan University (NMMU).

Objective: The objectives of this study were to obtain baseline information, describe dietary intake, alcohol consumption and exercise patterns and determine associations between lifestyle risk behaviours.

Methods: NMMU students, older than 18 years were invited to participate in a cross-sectional survey after giving informed consent. Ethics approval was obtained from the Research Ethics Committee. An electronic self-administered, close-structured questionnaire was developed and completed by a convenience sample of 619 students during May 2013. Data was analysed using SPSS. Logistical regression analysis were done to assess poor eating patterns in the context of regular alcohol use ($p<.05$).

Results: Of the sample, 65% (n=401) ate less than one vegetable a day, 67% (n=413) ate less than one fruit a day and 71% (n=442) had an inadequate dairy intake. An inactive lifestyle was reported by 49% (n=296) of respondents and significantly more females ($p<.01$) seldom or never participate in organised sports. Only 22.5% of students consumed alcohol more than once a week; however, apart from unhealthy snacking (OR 0.64; $p<0.01$,) where students using alcohol less than once a week were more likely to snack unhealthily, no significant associations could be demonstrated between poor eating patterns and regular alcohol use.

Conclusion: More research at intervention should be done at NMMU regarding the poor dietary intake and exercise patterns of students. These behaviours were however, not associated with alcohol consumption patterns.

30. Fatty acid composition of South African beef: Grass fed vs. grain fed

Nicolette Hall, Hettie Schonfeldt, Beulah Pretorius
University of Pretoria

Introduction: Production systems influence the fatty acid composition of meat. The roles of fatty acids in nutrition are currently under investigation. Although 60% of cattle in South Africa are farm reared, more than 75% are rounded off on grain fed production systems (feedlots) to reach the preferred fatness level within a shorter period of time which positively contributes to tenderness. However, grass fed beef has gained popularity owing to possible positive fatty acid profiles.

Objective: The objective was to determine the fatty acid composition of South African beef produced on grain and grass fed production systems.

Methods: Cattle from each of the four age groups (n=9X4) were selected based on feeding regime and level of fatness. Carcasses, slaughtered under controlled conditions, were dissected into primal cuts. The cuts were dissected into bone, muscle and fat. Analyses were performed on both muscle and fat portions on a double blind basis at NutriLab, University of Pretoria, using Gas Chromatography. Data was analysed with Genstats (2013).

Results: Significant differences were found in the fatty acid composition between the different age groups, primary cuts and production systems.

Conjugated Linoleic Acid (CLA), a fatty acid promoted to have beneficial health properties, was significantly different in grass fed cattle than in grain fed cattle, and also between the different age groups.

Conclusions: The differences in fatty acids between grain and grass fed beef indicated the possibility to position these products differently. The trade off in terms of tenderness vs. health need to be further investigated.
Keywords: beef, grass fed

31. Sustainable diets: Food for healthy people and a healthy planet: Workshop summary

Terry Harris
Discovery Vitality

Institute of Medicines (IOMs) Food Forum and Roundtable on Environmental Health Sciences, Research and Medicine convened a public workshop in 2013. The purpose of the meeting was to: 1) explore current and emerging knowledge on the food and nutrition policy implications of the increasing environmental constraints on the U.S. food system, keeping in mind the context of global sustainability issues; and 2) to engender dialogue between those concerned about environmental sustainability and natural resource use and the nutritional value of the food supply and dietary guidance policy, that will advance the discussion of dietary guidance and environmental sustainability in the United States. The objective of the workshop was not to reach consensus on any issue or make recommendations for future action.

The report covers the following chapters: identifying relationships between eating patterns and the environment; quantifying synergies and trade-offs between health and the environment; sustainable commodity sourcing and the food price environment; options and approaches to enable sustainable food choices; options and approaches to enable sustainable food choices and implications of behavioural economics for the food environment and choices of behavioural economics. Derek Yach from the Vitality Institute, New York, participated in the workshop and his remarks are captured in the report.

Reference was made to the impact of the South African Vitality HealthyFood benefit programme which subsidises healthy food purchases.

http://www.iom.edu/Reports/2014/Sustainable-Diets-Food-for-Healthy-People-and-a-Healthy-Planet.aspx

32. Street-food vending – Crossing the divide between basic nutrition needs, healthy diet and making a profit

Jillian Hill, Zandile Mchiza, Nelia Steyn
Medical Research Council

Background: Very few data exist on street-food vendors and their businesses in South Africa, despite their proliferation and popularity. Street-food vending is one of the main occupations in the informal sector and a major contributor to our economy.Moreover, 11.3% of South Africans purchase streetfoods frequently. Most foods sold onthe streetare energy-dense and high in sugar, salt, fat, and trans- and saturated fats and low in fibre and micronutrients, which may contribute to non-communicable diseases (NCDs) when consumed regularly.

Aim: To conduct a situational analysis on street-food vending, including vendors' nutrition knowledge,type and nutritional contentof foodssold in the Cape peninsula.

Methods: Street-food vendors (n=820) answered questions about their businesses, types of food items soldand nutrition knowledge questions. Trained fieldworkers conducted interviews using validated questionnaires. Descriptive statistics and cross tabulations were used to analyse data with SPSS.

Results: Most vendors were female (53%), black Africans (77%), aged 25-54 years, and had some high school (51%) education. They trade up to seven days/week for 8-12 hours.Items sold by vendors were high-fat cooked meals including deep-fried food (33%), packaged processed snacks such as crisps (40%), and concentrated sugar beverages (23%). However it was encouraging to find that 38% sold fruits and vegetables. Most vendors (58%) obtained average nutrition knowledge scores, whereas 16% obtained poor scores.

Conclusion: The majority of food sold by vendors in the streets of South Africa are energy-dense and of poor nutritional value, therefore may contribute to the development of NCDs and their determinants such as hypertension and obesity.

33. Knowledge, opinions and practices of healthcare workers related to infant feeding in the context of HIV

Liska Janse van Rensburg, Corinna Walsh, Riette Nel
University of the Free State

Introduction: The importance of health care workers guidance for women infected with human immunodeficiency virus (HIV) regarding infant feeding practices cannot be over emphasised.

Objective: Determining the knowledge, opinions and practices related to infant feeding in the context of HIV of healthcare workers in maternity wards in a regional hospital in Bloemfontein, Free State.

Methods: A descriptive cross-sectional study design was employed. Healthcare workers in the maternity wards of Pelonomi Regional Hospital who volunteered and gave consent during scheduled meetings (n = 64), were included in the study. Self-administered questionnaires were distributed.

Results: Only 14% of the respondents considered themselves to be experts on HIV and infant feeding. Almost 97% felt that breastfeeding is an excellent feeding choice if the proper guidelines are followed. However, 10% indicated that formula feeding is the safest feeding option. 45% thought that feeding expressed heat treated breastmilk is a good option, while 29% thought it is a good option but requires too much work. Only 6% could comprehensively explain the term exclusive breastfeeding as defined by the World Health Organisation (WHO). Confusion existed regarding the period that an infant can be breastfed according to the newest guidelines, with only 26% providing a correct answer. 20% indicated, incorrectly, that no risk exists for HIV transmission via breastfeeding when following the guidelines.

Conclusion: Knowledge of the healthcare workers did not compare favourably to current WHO guidelines, considering that these health care workers are active in maternity wards where HIV-infected mothers regularly seek advice on infant feeding.

34. Dietary markers for identifying risk factors for disability progression in multiple sclerosis

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NHLS

Objective: Current therapeutic strategies for multiple sclerosis (MS) have modest efficacy in the prevention of disability. MS patients were assessed using a lifestyle and diet questionnaire as well as biochemical tests to identify markers for disability progression.

Methods: Disability status was assessed using the Expanded Disability Status Scale (EDSS). The study questionnaire was completed by 58 MS patients who indicated how many days a week they ate certain foods. The intakes were correlated with the EDSS, the age at which they were diagnosed, body mass index (BMI) and total cholesterol levels.

Results: There was a steady improvement in disability as daily intake of fruits and vegetables increased. The difference between 0 or 1 day intake and 6 or 7 days intake was statistically significant ($p = 0.048$). Furthermore, intake of avocado and spinach ($p= 0.03$) and citrus ($p = 0.02$) correlated significantly with an improvement in disability, while the intake of biscuits, cakes and cookies ($p=0.03$) correlated with an increase in disability. Age of diagnosis was earlier in patients who ate more hamburgers ($p=0.02$), fried hot potato chips ($p=0.01$) and full cream dairy products ($p < 0.01$). A statistically significant positive association was observed between cholesterol levels and intake of butter and margarine ($p=0.03$), as well as between BMI and intake of butter and margarine ($p<0.01$), red meat ($p<0.01$), fried chicken ($p=0.04$), and biscuits cakes and cookies ($p=0.04$). BMI was inversely related with intake of citrus ($p=0.03$).

Conclusion: Dietary patterns play a significant role in clinical outcome of MS patients.

35. Dietetics students: More eating disordered than other study majors? The UKZN experience

Susanna Maria Kassier, Frederick Johannes Veldman
UKZN

Introduction: Eating disorders (ED) are more prevalent amongst dietetic majors. However, results are conflicting. An increase in nutrition knowledge in the course of study improved eating attitudes and eating behaviour.

Objectives: To determine: (i) eating behaviour, eating attitudes and BMI of first year dietetic students compared to first year non-dietetic majors and; (ii) to determine whether subsequent years of studying dietetics has an effect on eating attitude and behavior.

Method: Cross-sectional, descriptive survey to compare first year non-dietetic majors (n=83) to dietetic students (n=24) to determine eating behavior (TFEQ), eating attitude and BMI between groups and to investigate whether there is a change in eating attitude and eating behavior from first to fourth year of studying dietetics.

Results: First year dietetic majors had higher levels of dietary restraint ($p<0.001$). Mean scores for eating attitude between both first years groups did not provide evidence of an existing eating disorder. A higher prevalence of disordered eating was present among first year dietetic students ($p<0.059$). Lower levels of dietary restraint and disinhibition (TFEQ) were documented for dietetic students in their third- and fourth year of study (n=38) when compared to first years. The mean BMI of all participant categories were normal.

Conclusion: The higher prevalence of ED among first year dietetic students highlights the need for further investigation to determine whether student dieticians are at an increased risk of an existing eating disorder or whether studying dietetics contributes to the development of an eating disorder.

36. Healthy weight loss intervention for overweight/obese urban Zulu women: Potential for success

Susanna Maria Kassier, Marjanne Senekal, Anniza de Villiers
UKZN

Introduction: Obesity is a major public health problem amongst urban black South African women.

Objective: An investigation into the potential of a healthy weight loss intervention to promote weight loss in treatment-seeking overweight/obese Zulu women.

Methods: Investigation of: (i) weight status and associated factors of subjects (n=99), (ii) weight loss once enrolled in a 16-week intervention in completers (n=20) and characteristics of drop-outs (n=79); and iii) qualitative insights into enrollment, completion and drop-out.

Results: i) The sample aged 31.4±5.4 years perceived current weight being lower than actual weight, ideal body weight being in the overweight/obese range, had a history of overweight/obesity, negative social experiences related to weight status; previous unsuccessful weight loss attempts, low sport participation; consumption of energy dense food/snacks; reduced levels of restraint, disinhibition and perceived hunger as well as relatively low self-esteem and depression. ii) Mean weight loss in completers (2.1± 4.9kg) was not significant. Drop-outs were younger and attempted fewer previous weight loss attempts. iii) Core salient issues that emerged regarding perceived gains to intervention enrollment, perceptions regarding a healthy weight loss intervention and considerations for success that promote enrolment, weight loss and curbing drop included weight loss, group support, support from family and friends, gaining knowledge regarding a healthy lifestyle and an improvement in physical and psychological well-being.

Conclusion: Considerations for a healthy weight loss intervention included the development of a culturally sensitive intervention and the involvement and education of family, friends and the community at large to serve a source of social support.

37. The Emergence of childhood obesity in Africa: nutrition, physical Activity and environmental correlates

Peter Katzmarzyk, Vicki Lambert, Vincent Onywera, Mark Tremblay
Pennington Biomedical Research Center

This 90-minute workshop will explore issues related to the emergence of childhood obesity in Africa. A panel of 4 speakers will present results from the International Study of Childhood Obesity, Lifestyle and the Environment (ISCOLE), a study involving approximately 7000 children from 12 countries representing every major world region. The results will focus on correlates of obesity measured in different environmental contexts, with a special emphasis on the presentation of results from Africa and comparisons to other world regions. In addition, a case study of work being done to study the epidemiological transition and to promote physical activity in collaboration

between Kenya and Canada will be highlighted. The specific presentations are as follows:

The International Study of Childhood Obesity, Lifestyle and the Environment (ISCOLE): Results from South Africa. E. Vicki Lambert, PhD, University of Cape Town, Cape Town, South Africa.

The International Study of Childhood Obesity, Lifestyle and the Environment (ISCOLE): Results from Kenya. Vincent Onywera, PhD, Kenyatta University, Nairobi, Kenya. The International Study of Childhood Obesity, Lifestyle and the Environment (ISCOLE): How Africa Compares to other Regions. Peter T. Katzmarzyk, PhD, Pennington Biomedical Research Center, Baton Rouge, USA, Active Healthy Kids Kenya and the KIDS-CAN Alliance: What Africa can Teach the World. Mark S. Tremblay, PhD, Childrens Hospital of Eastern Ontario, Ottawa, Canada

38. An evaluation of knowledge and current trends of omega-3 supplementation in parents of children at public primary schools in the city of Cape Town

Ms Megan Kluyts
Self-employed

Objective: To determine the current knowledge and trends of omega-3 (n-3) supplementation in parents of children at public primary schools in the City of Cape Town.

Design: An observational, analytical, descriptive and cross-sectional study.

Methods: Purposive sampling was used to select a minimum of 150 parents from the six (6) randomly selected public primary schools. The schools were then divided into three different living standard measure (LSM) groups. The research questionnaire was made available at the Parent Teachers meetings where all parents had the option to complete the questionnaire anonymously at the meeting.

Results: Six hundred and fifty seven (n=657) parents completed and returned the questionnaires. Prior to the study, 80.1% of parents (n=526) had heard of omega-3 supplements and overall knowledge of omega-3 was significantly better in this group (p=0.00) when compared to the group that had not heard of omega-3 previously. The high and low LSM groups differed significantly in terms of omega-3 knowledge (p=0.02). A total of 38.5% (n=253) of parents indicated that they gave their children omega-3 supplements. The overall omega-3 knowledge was significantly better (p=0.00) in parents who gave their children omega-3 supplements. Most parents indicated that the omega-3 supplement they administered was from a marine source (n=105, 41.5%).

Conclusions and recommendations: Statistically significant differences existed between the three LSM groups regarding various aspects of omega-3 knowledge and those parents who gave their children omega-3 supplements. Recommendations include education, public health programs supplying information to parents on omega-3 supplementation and on omega-3 in the childrens diets.

39. Nanostructured iron and calcium compounds for nutrition: understanding in vitro dissolution

Jesper TN Knijnenburg, Florentine M Hilty, Eleni Seristatidou, Frank Krumeich, Sotiris E. Pratsinis, Yiannis Deligiannakis, Michael B Zimmermann
ETH Zurich

Nanostructured iron-containing compounds are promising for food fortification and supplementation to alleviate iron deficiency. Because of their very high specific surface area such materials demonstrate rapid dissolution in dilute acid and high iron bioavailability, while causing fewer sensory changes than water-soluble FeSO4. Furthermore, incorporation of Ca or Mg in nanostructured Fe oxides further improves their dissolution. To further understand how Ca improves Fe dissolution, we studied here the relation between the dissolution rate and iron structure (amorphous/crystalline or monomeric Fe3+). We used X-ray diffraction (XRD) and electron paramagnetic resonance (EPR) spectroscopy as complementary techniques to assess iron structures in Ca/Fe oxides as function of nanoparticle composition. We prepared nanostructured mixed Ca/Fe oxide-containing powders by flame spray pyrolysis and monitored their dissolution over time in acidic solutions by EPR spectroscopy. We distinguished three types of Fe in the powders: monomeric Fe3+ and crystalline Ca2Fe2O5 at low Fe content powders, and amorphous/crystalline Fe2O3 at high Fe contents. During dissolution, monomeric Fe3+ and crystalline Ca2Fe2O5 dissolved rapidly, while crystalline Fe2O3 was more stable and only slowly released Fe3+, even at pH 1. Thus, the optimization of nanostructured iron compounds for nutrition should minimize formation of crystalline iron oxides, by e.g. addition of high Ca contents. Aging of Ca-rich powders under ambient conditions resulted in the formation of CaCO3, which did not significantly affect Fe dissolution. Other elements such as Zn, Cu and Mn, or their combinations, may be incorporated into CaO, with potentially high in vivo bioavailability.

40. Household characteristics and anthropometric status of recipients of the Child Support Grant in Avian Park and Zweletemba

Hilletjie Koornhof, Mildred H McLachlan, Mieke Faber
Stellenbosch University

Objective: Comparison of households receiving a child support grant (CSG) and those without regarding anthropometric status of the primary caregivers (PCGs), their dietary diversity, socio-demographic factors, food security and anthropometric status of their children.

Design: Cross sectional, descriptive study

Setting: Randomly selected households in Avian Park (n=211) and Zweletemba (n=242) in Worcester, South Africa.

Subjects: Children, 0 – 36 months old; their PCGs.

Methods: Data collected by questionnaire included socio-demographic data, Household Food Insecurity Access Scale (HFIAS) and dietary diversity score (DDS). Anthropometric measurements included weight, height plus waist circumference of mothers/ PCGs and mid-upper-arm circumference of children. Households receiving CSGs and not were compared using a X2-test or t-test.

Results: Age, marital status, education level and employment status of PCGs in CSG households and non-CSG households were similar. Household size was larger ($p<0.0001$) in CSG ($n = 5$) versus non-CSG households

(n = 4); CSG households had more people per room (2.7 [SD 1.5] versus 2.3 [SD 1.2]; p=0.0037). CSG households had lower monthly income than non-CSG households (R2 723 [SD R3 297] versus R4 520 [SD R6 464]; p=0.0033). HFIAS scores showed more food insecurity (p = 0.0178) in CSG households than non-CSG (3.55 vs. 2.37; p= 0.0178), but dietary diversity was similar. Stunting was more in CSG (34.9%) vs. non-CSG (22.7%) children. CSG mothers/PCGs had larger (p = 0.021) waist circumferences (90.0 cm; SD = 16.8) than non-CSG mother/PCGs (88.5 cm; SD = 16.5).

Conclusions: Monthly household income in CSG household was less despite receiving the CSG.

41. A description of dyslipidaemia and selected risk factors for cardiovascular disease in patients attending secondary hospitals (Port Elizabeth, Eastern Cape)

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University of Pretoria

Introduction: Dyslipidaemia is a major cardiovascular risk factor in South Africa. The Census 2001 reported that about 5.7 million people in South Africa have hypercholesterolaemia (TC >5mmol/l) and that 59% of the ischaemic heart disease (IHD) mortality. Disease burden was attributable to elevated total cholesterol levels above 3.8 mmol/l.

Objectives: To identify and describe the dyslipidaemias and selected risk factors for cardiovascular disease in patients diagnosed with dyslipidaemia.

Setting: Port Elizabeth Hospital Complex (PEHC)

Sample: 102 eligible patients diagnosed with dyslipidaemia

Methods: Data obtained from each subject included anthropometrical data, biochemical indicators, clinical information and lastly screening for total cholesterol and saturated fat intake with the MEDFICTS questionnaire.

Results: The sample had a mean age of 60 years and consisted of 44 males and 58 females. The mean body mass index of the sample was 30,7 kg/m^2 with 31% classified as overweight and 52% as obese. The presence of selected clinical risk factors in the sample were diabetes mellitus (37%,n=38), smoking (25%,n=26), a family history of coronary heart disease (73%,n=74) and hypertension (84%,n=86). Biochemical risk factors present included hypercholesterolaemia (36%,n=37), decreased high density lipoproteins levels (n=45) and a high prevalence of LDL hypercholesterolaemia (68%, n= 69). Twenty six (26) smoked and 42 had a smoking history. A diet high in total cholesterol and saturated fat intake were present in 40% (n=41) of the sample.

Conclusions: Increased awareness of the risk factors present in the population can result in more efficient and specific counseling thus improving the treatment of patients presenting with dyslipidaemia.

42. A specific range of vegetables/herbs/fruit affects bone markers in post-menopausal women

Marlena Kruger, Caroline Gunn, Janet Weber
Nutrition

Introduction: Vegetables/herbs/fruit may reduce bone loss in midlife women through provision of polyphenolic compounds, potassium and lower renal acid load which may reduce inflammation, bone turnover and urinary calcium excretion.

Objectives: To test whether 9 servings/day of specific vegetables/herbs/fruit reduces bone turnover markers and inflammation.

Methods: Two intervention groups of healthy postmenopausal (PM) women (n=50/group) were randomly assigned to consume ≥ 9 servings vegetables/herbs/fruit daily of either a generic range of vegetables/herbs/fruit (A) or vegetables/herbs/fruit with evidence-based bone resorbing inhibiting properties (B)called the Scarborough Fair group (SF). A control group (n=43) was instructed to consume their usual diet. Plasma bone and inflammation markers, urinary pH and electrolytes (24 hour), dietary intake (three day diaries) and estimated dietary potential renal acid load (PRAL) were assessed at baseline and at the end of the study (12 weeks).

Results: The bone markers PINP reduced (-3.2ug/L, p<0.01) in the SF group and CTX (-0.065ug/L, p<0.01) in SF women with low bone mass. Inflammatory markers decreased in all three groups and urinary potassium also increased in the control group reflecting dietary change ("Hawthorne" effect). Urinary calcium conservation occurred in all groups but only intervention groups A and B (SF) with decreased PRAL and increased urine pH had a significantly decreased percentage urinary calcium loss.

Conclusion: All groups increased potassium intake and showed reduced inflammatory markers and urinary calcium loss but bone turnover markers reduced only in the SF group. Regular consumption of a range of specific vegetables/herbs/fruit may reduce bone turnover in PM women.

43. Reduction in phytate content does not guarantee increased iron availability in staple grains - non-clinical assays

Johanita Kruger, John Taylor
University of South Africa

Introduction: Iron deficiency is highly prevalent in sub-Saharan Africa. Increasing the iron content and/or bioavailability of staple grains is gaining popularity as interventions to address iron deficiency. These interventions are however not always successful, in some cases due to the fact that the iron in the food and/or product introduced was not bioavailable in the specific diet.

Objectives: To evaluate the efficacy of phytate reductions in staple grains to increase iron availability measured with non-clinical assays.

Methods: Fermentation, soaking and genetic modification are widely used to reduce the phytate contents of staple grains. The effects of these methods of phytate reduction on the mineral contents, iron availability (phytate: iron molar ratios, bioaccessibility, uptake, absorption) and anti-nutrient contents of sorghum and maize were evaluated.

Results: Fermentation of non-tannin sorghum and maize porridges increased iron availability. A phytate reduction, through biofortification, of more than 80% is necessary to increase iron availability in sorghum porridge. However, even large phytate reductions (80%) are inadequate if there are appreciable amounts of tannin in sorghum grain. Soaking not only decreases phytate content but also soluble iron content, resulting in no improvement in phytate: iron ratios of sorghum and maize.

Conclusions: Reducing the phytate content of staple grains does not always result in increased iron availability. Non-clinical assays should be used to screen the effect of a particular phytate reduction on iron availability before it is used in a nutritional intervention to increase iron status.

Keywords: iron, availability, non-clinical assays, staple grain

44. The potential of in situ elemental maps to improve mineral nutritive value of grains

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Introduction: In developing countries the prevalence of mineral deficiencies (especially iron and zinc) is often high due to low bioavailability from monotonous grain based diets, which is high in bioavailability inhibitors. Due to the completely destructive nature of mineral analytical assays, there is limited information on the location of minerals within edible grains. As a consequence, there are many unconfirmed theories and hypothesises on the role mineral location plays in the nutritive value of edible grains for.

Objectives: To evaluate the role of in situ elemental maps (generated by Proton Induced X-ray Emission (PIXE) spectroscopy) of edible grains as a tool to improve their mineral nutritive value.

Methods: Cereal (finger millet) and legume (normal and hard-to-cook (HTC) cowpea) grains, in which it is theorised that mineral composition/location is unique or minerals play a role in physiological processes were analysed using PIXE.

Results: PIXE confirmed that the reported high calcium and potassium contents of finger millet grains were not because of contamination. PIXE also visualised the migration of minerals caused by the HTC defect in cowpeas and identified/excluded mechanisms which results in reduced iron, zinc and calcium bioaccessibilities.

Conclusions: In situ elemental maps have considerable potential as a tool to aid in the identification mechanisms of mineral bioavailability inhibition, assist in biofortification to improve mineral bioavailability and evaluate the role minerals play in physiological processes.

Keywords: PIXE, mineral availability, in situ, elemental map, millet, cowpea

45. The sensitivity of body mass index cut-points to identify cardio-metabolic risk in black South Africans

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North-West University

Introduction: Cardio-metabolic risk is estimated according to the World Health Organization (WHO) body mass index (BMI) classification of weight status. The WHO cut-point is 25 kg/m^2 indicating overweight for both men and women, but the cut-point for obesity-related health risk may differ by ethnicity.

Objectives: To determine an optimal BMI cut-point for the identification of cardio-metabolic risk in black South African adults.

Methods: We included HIV-uninfected black South Africans aged 30-65 years (538 men, 890 women) from the North West Province. Demographic and anthropometric measures were taken and blood pressure, fasting serum triglycerides, HDL-cholesterol and blood glucose measured. More than two risk factors (blood pressure >130/85 mmHg, glucose >5.6 mmol/L, triglycerides >1.7 mmol/L, HDL-cholesterol <1 mmol/L in men/ <1.3 mmol/L in women) was defined as elevated cardio-metabolic risk. Receiver Operating Characteristic (ROC) curves were applied to identify an optimal BMI cut-point in each sex group.

Results: The ROC curves showed that BMI had good diagnostic performance to identify clustering of >2 risk factors, as well as low HDL-cholesterol, elevated fasting glucose and triglycerides, with areas under the curve (AUC) >0.6, but not for high blood pressure in men. Optimal BMI cut-points averaged 22 for men and 24 kg/m^2 for women, respectively. These cut-points showed good sensitivity for cardio-metabolic risk in men compared to a BMI cut-point of 25, and in women compared to BMI cut-point of 30.

Conclusions: Our results indicate a lower BMI cut-point for men compared to the WHO overweight cut-point, as well as the cut-point for women.

46. Nutrition knowledge, attitudes and practices of learners and teachers in primary schools in Bronkhorstspruit, South Africa

Mojisola Kupolati, Una E MacIntyre, Gerda Gericke
Self-employed

Introduction: Optimal nutrition knowledge is necessary for healthy dietary behaviours to occur. Nutrition knowledge, attitudes and dietary practices (KAP) scores for learners have been variously reported in literature. There is however no information on the KAP of learners and teachers in the Bronkhorstspruit district.

Objective: The study aimed to assess the nutrition KAP of learners and teachers as a baseline for planning a tailored nutrition education programme.

Methods: Standardised nutrition KAP questionnaires were administered with assistance to (i) learners (n = 354) in two randomly selected schools, (ii) teachers (n = 74) through self-administration in 11 purposively selected schools. Descriptive statistics were used to calculate the mean KAP scores and the frequency distributions of responses. The study was approved by the Faculty of Natural and Agricultural Sciences, UP and the Gauteng Department of Basic Education.

Results: Mean scores for learners nutrition knowledge and attitudes were 60% and 58%. High percentages of learners reported eating fast foods daily or several times a week (58%), always choosing corn snacks/ice-cream/ sweets/cakes/fat cakes as snacks (56%) and eating sweets/chocolates/ice-cream daily or several times a week (67%). Mean scores for the teachers nutrition knowledge and attitudes were 78% and 83% respectively. Low scores were observed in questions relating to diet and disease relationships. Teachers responses in respect of dietary practices showed consistency with healthful choices to varying degrees.

Conclusions: These results show that teachers KAP status was good while that of learners needs to improve.

47. Teachers' perspectives of the impact of school nutrition education on learners' eating behaviours - A qualitative exploration

Mojisola D Kupolati, Gerda J Gericke, Una E MacIntyre
Self-employed

Introduction: An in-depth investigation into the how, what and whys of the practices in schools nutrition education (NE) can provide invaluable information towards understanding the impact on learners and how to modify the teaching of nutrition to benefit the health of the individual.

Objective: The study explored teachers perspectives on the potential of NE in schools to impact lifelong eating behaviours of learners.

Methods: Twenty four primary school teachers in the Bronkhorstspruit district, Gauteng, South Africa, who taught nutrition topics in grades 4 to 6, participated in three focus group discussions. Transcript data obtained

were analysed using the thematic approach of the framework method of qualitative analysis. The study was approved by the Faculty of Natural and Agricultural Sciences, UP and the Gauteng Department of Basic Education.

Results: Eleven major themes and several sub themes were categorised into teachers perspectives on school, teaching, learners and environment. School support for NE was limited, which undermined the impact of school NE on eating behaviours of learners. The need to strengthen teachers capacity to model positive eating behaviours was identified. Learners were perceived as not completely ignorant of healthy eating but with limited capacity to effect changes. While negative influences were identified, there were also positive environmental influences to be encouraged.

Conclusions: Understanding the prevailing school situation, teachers roles, learners perspectives and the environment is important in addressing issues that influence the impact of NE on learners eating behaviours.

48. Promoting healthy eating among grade five and six learners: a theory-based nutrition lesson plan template

Mojisola D Kupolati, Gerda J Gericke, Una E MacIntyre
Self-employed

Introduction: A nutrition curriculum that promotes learning through action and experience with a participatory approach and local food relevance is essential for changing eating behaviours. Application of relevant behavioural theories can strengthen the curriculums ability to address identified nutrition needs.

Objective: To develop a nutrition lesson plan template for grades 5 and 6 using the Department of Basic Educations (DoBE) curriculum and the combination of Social Cognitive Theory (SCT) with Meaningful Learning Model (MLM).

Methods: Selected constructs of the SCT and MLM were integrated into the DoBE curriculum with the identified prevailing situation of the learners in designing a lesson plan template. Prevailing situation included available local foods, learners limited nutrition knowledge, and learners compromised attitudes and dietary practices.

Results: The template integrates seven constructs of SCT (5) and MLM (2) with learning objectives and class activities. Constructs include the learners environment, behavioural capability and expectations, observational and self-regulated learning and the recognition and integration of prior knowledge. Participatory and appropriate learning activities are emphasised. The template can be applied to grades 5 and 6 nutrition topics as the content is aligned with DoBEs curriculum.

Conclusions: The prospects of the theory-based lesson plan template at enabling learners acquire relevant nutrition knowledge and empower them for healthy eating appears promising. Hence, the DoBEs aim to ensure children acquires and applies knowledge and skills in ways that are meaningful to their own lives may be realised.

49. Infant feeding intentions and practices of pregnant women at a resource-poor setting in Gauteng

Rendani Ladzani
University of Pretoria

Objectives: To assess feeding intentions and practices of pregnant women in resource poor settings.

Methods: A pre-post-test quantitative study was conducted at Mamelodi. Data was collected using a structured questionnaire. Pregnant women were recruited a t a local clinic during antenatal clinic days. Consecutive sampling was used to select participants. A total number of 79 women gave consent to participate in the study and they were interviewed.

Results: The mean age was 26.7 years (SD 6.2). A quarter of the women were unemployed. Forty-two percent lived in houses made of corrugated iron at informal settlements. Sixty percent intended breast feeding their infants. About 20% intended breast feeding for three to four months, and 60% intended breast feeding for six months. Just over a quarter said their mother-in-law recommended breast feeding plus porridge. Half of the women said they would breast feed exclusively for the first three months of life. Regarding introduction of complimentary feeding for the older child, a quarter of women introduced complimentary feeding during the second and third month. Women reported giving over-the-counter medication to manage constipation (39%). About 17% consumed alcohol.

Conclusion: A high proportion intended to breast feed their children, but it was not specified whether this was exclusive breast feeding. A high proportion of women intended giving infant formula. The study revealed a need to intensify nutrition education during pregnancy in order to promote breast feeding and child health.

Keywords: infant feeding, care practices pregnant women

50. Sodium and potassium intakes and hypertension in a black community in Mangaung, Free State

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Introduction: Non-communicable diseases, including hypertension are rapidly increasing in resource-poor developing countries. A reduction in sodium intake with accompanying increase in potassium intake is recommended to prevent and treat hypertension. A more profound blood pressure elevating effect of sodium is found in black population groups, urging investigation.

Aim: To assess sodium and potassium intake in a low-income, black, urban community, to examine whether intake are associated with blood pressure levels and prevalence of hypertension.

Methods: Data from the Assuring Health for All in the Free State study were used. Blood pressure was measured using standard procedures. Spot-urine samples were analysed for sodium and potassium by an accredited laboratory, using integrated chip technology (ICT).

Results: 339 Adults (263 females) were included in the study, mean age 44.3+10.6 (SD) years. Urine samples were available for 318 participants. 63.4% of the study population (n=339) were hypertensive. Mean calculated daily sodium excretion was 178.0 ± 53.0 mEq/day (SD), and positive correlations found between urinary sodium levels and systolic (r= 0.125; p=0.026), diastolic (r=0.145; p=0.010) and mean arterial pressure (r=0.149; p=0.008). Most participants (94.3%) had urinary sodium excretion levels reflecting sodium intakes above recommended intake. No association between potassium: sodium ratio and mean arterial pressure were found.

Conclusion: The prevalence of hypertension and sodium intake were high. Associations between sodium intake and systolic, diastolic and mean arterial pressure were found, with higher sodium intakes being associated with higher blood pressure levels, indicating the need for dietary sodium reduction strategies in order to control hypertension in this population.

51. Comparison of sodium and potassium concentration in 24 hour and spot urine samples in male students

Ronette Lategan, Corinna May Walsh, Sonja Nelson, Mandla Ramagoma, Carika Weideman
University of the Free State

Background: The most reliable method to determine sodium and potassium intake is through calculation from 24 hour excretion. Collection of a 24 hour urine sample is a cumbersome procedure, while spot urine samples are easy and convenient.

Aim: To compare the concentration of sodium and potassium in spot urine samples with results from 24 hour urine samples in a South African population.

Methods: Urine samples were collected from 100 healthy male volunteers 18 years and older, recruited from campus residences from the University of the Free State in Bloemfontein, South Africa. A 24 hour urine sample and a fasting spot urine sample were collected and weight, height and blood pressure were measured.

Results: Median age of participants was 19 years and median body mass index 22.4 kg/m². 82% of participants were normotensive and 18% hypertensive, with no association between race and hypertension status. No significant difference between the 24 hour urinary sodium and spot sodium values were found. Potassium results showed a statistically significant difference between 24 hour and spot potassium values, indicating that 24 hour values differed from spot values.

Conclusion: Results from this study showed that spot urine can provide a reliable alternative for estimating dietary sodium intake compared to a 24 hour analysis, but that spot potassium values differed from 24 hour values, indicating that spot potassium cannot be used as an accurate alternative to 24 hour urine potassium.

52. The life style approach in achieving long term sustainable weight loss in a private practise

Martha Leach,
Litchi Living

Introduction: There are currently very little data on dieticians consulting practices or client profiles relating to weight loss in South Africa. The present case studies describe the approaches to adult weight loss treatment, the consultation characteristics and client outcomes of a private practicing dietician in Gauteng, South Africa.

Objective: To improve client health using a lifestyle approach to healthful eating and increased physical activity.

Methods: A 115.2 kg 52 year old female, 101.7 kg 43 year old male and 68.8 kg 44 year old female came for a first consultation in August 1997, July 2004 and August 2011 respectively. They were educated on how a lifestyle approach for weight-management can manage their weight. A flexible, small-changes approach was used with structured carbohydrate and protein portion-prescription for weight loss treatment with all food items chosen containing no more than 7% saturated fat with a treat meal once a week. Physical activity was promoted for 3 hours per week. Individual portions were calculated with the Zest dietetic programme.

Results: The clients were seen weekly, monthly, 6 monthly and yearly with good progress. After 17, 10 and 3 years they still visit the practice yearly and are maintaining weights of 67.4kg, 66.7kg and 55.6kg with total weight loss of 48.5kg, 35kg and 13.2kg respective, validating that the weight loss was sustainable.

Conclusion: Sustained weight loss was possible through evidence-based guidelines and a life style approach. Annual consultations are valuable to maintain the long-term benefits of the life style approach.

53. Encapsulation of sorghum condensed tannins in kafirin microparticles to inhibit digestive amylases

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Introduction: Control of hyperglycaemia is a known management strategy for Type 2 Diabetes (T2D). Recently, polyphenols have been investigated for their ability to reduce post-prandial hyperglycaemia and some have indicated effective reduction of post-prandial hyperglycaemia by inhibition of the carbohydrate digesting enzymes, α-amylase and α-glucosidase. Oral administration of polyphenols has some limitations. Polyphenols bind to proteins, resulting in unpleasant tastes and loss of enzyme inhibition. A delivery system is needed to ensure that polyphenols reach the small intestine with sufficient activity to effectively inhibit the digestive amylases.

Objectives: To determine the effect of sorghum condensed tannins (SCT) on α-amylase and α-glucosidase activity and evaluate kafirin (sorghum prolamin protein) microparticles (KEMS) as a delivery system for SCT.

Methods: The inhibitory concentrations (IC50) of SCT against α-amylase and α-glucosidase was determined and compared with a standard inhibitor (acarbose). SCT were encapsulated in KEMS by a coacervation process and subjected to simulated digestion. Electron microscopy was used to examine the effect of digestion and encapsulation of SCT.

Results: SCT exerted potent inhibitory activity against α-glucosidase (IC50 =0.4 µg/ml) and strongly inhibited α-amylase (IC50 = 0.6 mg/ml) compared to acarbose (α-amylase – IC50 = 3.1 µg/ml and α-glucosidase IC50 = 8.5 mg/ml). SCT encapsulated in KEMS retained high inhibitory activity against both α-amylase and α-glucosidase throughout the simulated digestive tract, while nonencapsulated SCT's ability to inhibit these enzymes decreased drastically.

Conclusion: Encapsulation of SCT in KEMS show potential as a natural plant-based nutraceutical to attenuate hyperglycaemia associated with T2D.

Keywords: Type 2 diabetes, hyperglycaemia, carbohydrate, SCT, KEMS

54. Fortified and unfortified maize meal Intakes of rural pregnant women in Vhembe, Limpopo province

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University of Limpopo

Introduction: Micronutrient fortification of commercial maize meal is compulsory in South Africa. Rural populations consuming home grown maize may not benefit from fortified maize meal.

Objective: To determine the intakes of fortified and home grown maize meal and their relative contributions to fortified micronutrient intakes of pregnant women in Vhembe, Limpopo.

Methods: Dietary intake data, using a food frequency questionnaire, were obtained from women delivering at Tshilidzini Hospital during the Venda Health Examination of Mothers, Babies and their Environment baseline study. Nutrient analysis was by the FoodFinder 3 program with fortified maize meal nutrient composition from the Condensed SA Food Composition Tables (2010).

Results: Maize meal intake data were available for 664 women and total diet data for a subsample of 144. Maize meal was consumed as soft, stiff and/or fermented porridge by 99.7% of the sample with 24% percent consuming both home grown and fortified maize meal. For the subsample, mean total dietary vitamin A, riboflavin, folate and iron intakes were significantly lower (p0.05) between home grown maize consumers and nonconsumers.

Conclusion: The use of unfortified maize meal may limit the benefits of fortified maize meal in populations with increased requirements but the effects must be viewed in the context of the total diet.

55. Attitude, Cultural beliefs and compliance of pregnant teenagers towards iron supplements in Mulenzhe Village, Vhembe District

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University of Venda

Introduction: Anaemia, often due to iron deficiency, is one of the most widespread causes of mortality and morbidity probably of the highest rates in the world. Iron supplementation plays a vital role during pregnancy in the reduction of the deficiency.

Objectives: To determine attitudes, cultural beliefs and compliance of pregnant teenagers towards iron supplements.

Methods: The study design is exploratory. The research was carried out at Mulenzhe village in Vhembe District. Study participants were conveniently selected. A total of 30 teenagers were interviewed in five groups of six people. An interview schedule and responses were captured in a tape recorder as well as in the notes. Data was analyzed using transcription and the use of themes and sub-themes.

Results: All pregnant teenagers were of the age between 13-19 years. Pregnant teenagers could not differentiate iron supplements amongst other tablets. Although pregnant teenagers didnt say much about beliefs, family values were of greater importance in iron intake. This study indicates that pregnant teenagers claims to use iron supplements as prescribed in the antenatal clinic, but side effects, large number of tables and tiredness (emotional) are suspected to lead to low compliance. However this study revealed negative and positive attitudes among pregnant teenagers towards iron supplements.

Conclusions: All pregnant teenagers didnt know iron supplements and their importance. This comes to a conclusion that lack of knowledge, side effects, large number of tables and tiredness might be the cause of negative attitudes to pregnant teenagers.

Keywords: iron supplementation, cultural beliefs, attitudes, compliance

56. Prevalence of obesity and socio-demographic status among primary school learners in tshaulu village in Vhembe district, Limpopo province

Vhutshilo Makwarela
Cansa

Introduction: Childhood obesity is becoming a health problem worldwide including South Africa and it is associated with a number of health problems and diseases during adulthood.

Objective: To determine the prevalence of obesity and assess the socio-demographic conditions among rural primary school learners.

Methods: A cross-sectional quantitative study was undertaken and descriptive statistics was used. Participants (n=320) and their mothers were selected by a simple random selection.

Body Mass Index (BMI) was measured to determine underweight, normal weight, overweight and obesity using the World Health Organization (WHO) cut-off points.

Results were analyzed with the Chi-square test, with probability level set at p-value ≤ 0.05, to establish any association between socio-demographics and childhood obesity.

Results: The prevalence of obesity in was 11.9%, overweight was 13.4%, and normal weight was 59.7%, while 15% was underweight.

A comparison of BMI and socio-demographic factors indicated that there was no significant difference between all the variables except for the impact school feeding programme had on BMI, (p=0.010). This indicated that the various socio-demographic factors of had no major impact on the BMI status of children.

Conclusion: The study results indicated that obesity is present among children living in rural areas of South Africa. This supports the findings from similar studies of a double burden of underweight and overweight co-existing in the same community in developing countries.

Keywords: BMI, overweight, childhood obesity, socio-demographic status

57. Allergic disease is associated withaltered fatty acid composition in primary school childrenof rural KwaZulu-Natal

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North-West University

Background: The prevalence of allergic disease is as high as 20% in SA. High n-6, and low n-3 LCPUFA statusas well as trans-fat have been implicated inallergic disease.In a previous study in iron-deficient SA school children, we found a dietary n–6:n–3 PUFAratio of 60:1.

Objectives: 1) to determine the prevalence of allergic diseasewith the International Study of Asthma and Allergies in Childhood (ISAAC) questionnaire; 2) tocompare the PBMC and RBC total phospholipid fatty acid (FA) composition of the allergic to the non-allergic group toinvestigate the associations between total immunoglobulin E (tIgE) and FA composition.

Method: This cross-sectional study utilizes baseline data (n=103) from the previous study.

Results: Allergy prevalence was27.2%. In PBMC, total n-3 LCPUFA and n-3 docosapentaenoic acid correlated negatively and the n-6:n-3 PUFA ratio positively with tIgE. In RBC, the osbond acid to docosahexaenoic acid ratio, as well as the osbond acid to arachidonic acid (AA) ratio, correlated positively with tIgE. AA was lowerand trans-C18:1n9 tended to be higher in PBMCs of the allergic children.PBMC AA correlated negatively with trans-C18:1n9.

Conclusions: These findings agree with the hypothesis that a high n-6:n-3 PUFA ratio, together with low n-3 LCPUFA status may be involved in allergic disease. Low AA levels were pertinent in the allergic rural South African children and our results also indicatethe possible involvement of trans-fat in the children's allergic state.

58. Nutritional status of children on the National School Nutrition Programme in Limpopo Province, South Africa

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University of South Africa (UNISA)

Introduction: The National School Nutrition Programme (NSNP) was introduced in South Africa in 1994, with the aim of fostering better quality education through provision of nutritious meals on all school days. The primary assumption of a school feeding programmes is that good nutrition can positively influence intellectual development and learning abilities of school children.

Objectives: To assess nutritional status of children receiving meals provided by National School Nutrition Programme.

Methods: A cross sectional survey was conducted in 18 randomly selected schools of which a total of 602 children were sampled. Children were interviewed to assess their nutritional and socio economic status using anthropometric measurements, a validated socio economic questionnaire as well as a 24-hour recall and a food frequency questionnaire.

Results: Participants were aged 10 (26.6%), 11 (35.4%) and 12 (35.4%) respectively. Up to 50.5% of the children were beneficiaries of child support grant. A total of 95.2% of participants consumed 3 -4 meals a day and a substantial number of participants (20.8%) did not eat breakfast. NSNP meal had energy contribution of 17.8% and 19.0% in males and females respectively. All age groups had calcium intake below 25% of RDI. Children in the study had a normal nutritional status with < 10% underweight, < 12% stunted and < 5% wasted with a Z- score of – 2SD.

Conclusions: The nutritional status of participants in the study was relatively normal from the assessment of growth using anthropometric measurements. Data revealed reasonably adequate intakes in all nutrients except for Calcium.

59. Knowledge and compliance of lactating mothers on exclusive breastfeeding in Maungani village, Vhembe district

Tshifhiwa Cynthia Mandiwana, Ntsako Khosa
University of Venda

Introduction: WHO (2011) recommends exclusive breastfeeding during the first six months of life for optimal growth, development and health. However Breastfeeding initiation rates are reportedly high in South Africa, but exclusive breastfeeding is far from ideal. South Africa is one of the countries with low prevalence of exclusive breastfeeding at 8%, according to the 2003 Demographic and Health Survey (DHS).

Objectives: To determine the exclusive breastfeeding knowledge and practice of lactating mothers with children less than two years.

Methods: Descriptive study design was conducted among 80 lactating mothers from Maungani village. Participants were selected using snowball sampling design. A validated questionnaire which consists of three sections was used to collect data. Likert scale was used to determine participant's knowledge on exclusive breastfeeding.

Results: The findings showed that 40% of the participants had good knowledge on exclusive breastfeeding, however 60% indicated to have poor knowledge. During the time of interview, all mothers (100%) indicated that they have initiated breastfeeding and only 5% exclusively breastfed their children for six months. There were several reasons given by mothers for not breastfeeding exclusively such as going back to work or school, not having enough milk and baby's hunger.

Conclusion: Majority of participants were aware that children should be exclusively breastfeed and on demand, however they failed to comply.

Keywords: exclusive breastfeeding, lactating mothers, knowledge & compliance

60. Nutrition knowledge and practices of home-based caregivers in Vhembe District

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University of Venda

Introduction: Nutrition is a major lifestyle factor in health promotion and is important in the prevention and management of chronic diseases. One of the components of home-based care is to promote and maintain good health, hygiene and nutrition.

Objectives: To determine nutrition knowledge and practices of home-based caregivers in Vhembe District.

Methods: Descriptive and exploratory study designs were used. Eight home-based care agencies were randomly selected from Makhado and Thulamela Municipalities of Vhembe District. The study population comprised of 128 home-based caregivers. Data was collected using questionnaire, interview guide and observation checklist during home visits. Quantitative and qualitative data were analyzed using SPSS and thematic analysis, respectively.

Results: About 68.7% of home-based caregivers had secondary and 18% had tertiary education. All received 59-days initial training. About 64.1% had 6-10 years working experience while 17.2% had more than 10 years. The results showed that 0.8% of home-based caregivers had adequate nutrition knowledge (100%). However, an average of 70% had responded correctly on each test question. Marital status, educational qualifications or number of years of home-based care experience had no influence on nutrition knowledge. Home-based caregivers reported cleaning, cooking, feeding and giving nutrition education as their practices. However, these activities were not done to all clients visited. Good nutrition practices were observed in the study.

Conclusion: The findings revealed that majority of home-based caregivers did not have adequate nutrition knowledge. However, nutrition practices of those who were observed were appropriate.

Keywords: Nutrition knowledge, nutrition practices, home-based care, home-based caregivers

61. Prevalence of Iron deficiency among preschool children aged 3-5 years in Vhembe district, Limpopo province, South Africa

Hlekani Vanessa Mbhatsani, Selekane Ananias Motadi, Xikombiso Gertrude Mbhenyane
University of Venda

Background: Children under five years constitute the most vulnerable group and their nutritional status is a sensitive indicator of community health and nutrition. Diet of many South Africans consists of porridge as staple food which is usually consumed with vegetables, legumes and a small amount of animal derived food. These animal derived food sources are not consumed extensively due to their high cost, limited supply and religious or cultural practices.

Objective: To determine the prevalence of iron deficiency among preschool children aged 3-5 years in Vhembe district, Limpopo province, South Africa. Methods. This study was carried out on 400 preschool children in Vhembe district, Limpopo province, South Africa. Municipalities were purposively selected and subjects were chosen by simple random sampling methods. Anthropometric measurements were made following standard techniques. Serum zinc, iron, ferritin, T saturation, transferrin and CRP levels were measured by atomic absorption spectrophotometery.

Results: Only 349 children out of the total population were included in this study. The prevalence of wasting, stunting and underweight was 1.4%, 18.6% and 0.3% respectively while 20.9% of the children were overweight and 9.7% were obese. The prevalence of zinc deficiency was 42.6% and anemia was 28%, both were significantly higher in females as compared to males. When using both serum ferritin and Tsaturation levels as markers of iron deficiency 7(2%) children were found to have IDA. Combined iron and zinc deficiencies using ferritin as a marker of iron deficiency was found in 8(2.3%) of the children while when using Tsaturation as a marker of iron 42(12%) of the children had combined iron and zinc deficiencies.

Conclusion: Zinc deficiency and anemia are common in preschool children of Vhembe district, Limpopo province. Iron and zinc deficiency in children is associated with poor growth development, alteration in neurological function, immunological response and behaviour changes.

62. Food fortification knowledge in women of child bearing age in Nkowankowa township

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University of Venda

Background: Globally there is evidence that three micronutrient deficiencies are of public health concern amongst children. They are vitamin A, iodine and iron deficiencies. Communities particularly affected are those in situations where poverty, unemployment, civil unrest, war and exploitation remain endemic. Malnutrition is an impediment to productivity, economic growth and poverty eradication. It is estimated that 32% of the global burden would be removed by eliminating malnutrition including micronutrient deficiencies (Labadarios, 2010).

The first Millennium development Goal (MDG) is directly related to eradicating hunger and malnutrition but many of the MDGs such as improving education, reducing child mortality, improving maternal health and other require good nutritional status. Food fortification programme is one of the strategies initiated to reduce hunger and malnutrition of women of child bearing age and children under five.

Objective: The main objective was to determine the womens knowledge of food fortification

Methods: The study design was descriptive. Snowballing method was use to identify women of child bearing age. Data was collected from 120 participants using a questionnaire.

Results: The findings revealed that about 58% of participants were to define food fortification correctly. While (72%) participants knew which foods are fortified, as well as the benefits of food fortification programme respectively. More than half (70%) of the participants knew that maize meal is one of the food vehicle used in South Africa.

Conclusion: The researcher deduced that the study participants are knowledgeable on food fortification based on the responses given in relation to the programme.

63. Management of severe acute malnutrition: WHO based commercial formula vs other interventions

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Department of Health

Introduction: Managing Severe Acute Malnutrition (SAM) remains a challenge in Thabo Mofutsanyana District. Following the implementation of WHO ten steps, the main challenge has been availability of appropriate formula for SAM intervention. Institutions were using self-prepared F-75 and F-100 and there were a lot of challenges leading to the use of Ready to use commercial feeds.

Objectives: To compare the operation impact and statistical outcome on the management of SAM using a WHO based commercial formula against a self-prepared formula and self-interventions in the absence of required ingredients.

Method: This study is a programmatic case study and the data has been gathered through monitoring and evaluation practices in the district. For this case study, 6 hospitals from the Thabo Mofutsanyana district have been included in the sample. Records that have been reviewed include monthly and quarterly district nutrition reports and DHIS data. Malnourished individuals older than 5 years have been excluded from this case study.

Results: The data from this case study showed that:

64. Statistical outcome: Average SAM Case fatality rate
    a. When commercial formula available 6.3%
    b. Self-preparation of WHO recipe 17.8%
    c. Self-interventions 21.8%
2. Operational impact challenges of preparing formula includes unavailability of ingredients, incorrect preparation and storage of feeds

Conclusion: Urgent strategies need to be put in place to acquire RTU formula for the management of severe acute malnutrition. F-75 needs to form part of the emergency trolleys at all PHC facilities to support the initial treatment of SAM.

Keywords: SAM, WHO Formula

64. Prevalence of zinc deficiency among preschool children aged 3-5 years in Vhembe district, Limpopo province, South Africa

Selekane Ananias Motadi
University of Venda

Background: Children under five years constitute the most vulnerable group and their nutritional status is a sensitive indicator of community health and nutrition. Diet of many South Africans consists of porridge as staple food which is usually consumed with vegetables, legumes and a small amount of animal derived food.These animal derived food sources are not consumed extensively due to their high cost, limited supply and religious or cultural practices.

Objective: To determine the prevalence of zinc and iron deficiency among preschool children aged 3-5 years in Vhembe district, Limpopo province, South Africa.

Methods: This study was carried out on 400 preschool children in Vhembe district, Limpopo province, South Africa. Municipalities were purposively selected and subjects were chosen by simple random sampling methods. Anthropometric measurements were made following standard techniques. Serum zinc, iron, ferritin, T saturation, transferrin and CRP levels were measured by atomic absorption spectrophotometery.

Results: Of the 400 children, 349 were included in this study. The prevalence of wasting, stunting and underweight was 1.4%, 18.6% and 0.3% respectively while 20.9% of the children were overweight and 9.7% were obese. The prevalence of zinc deficiency was 42.6% and anemia was 28%, both were significantly higher in females as compared to males. When using both serum ferritin and Tsaturation levels as markers of iron deficiency 7(2%) children were found to have IDA. Combined iron and zinc deficiencies using ferritin as a marker of iron deficiency was found in 8(2.3%) of the children while when using Tsaturation as a marker of iron.

Conclusion: Zinc deficiency and anemia are common in preschool children of Vhembe district, Limpopo province. Iron and zinc deficiency in children is associated with poor growth development, alteration in neurological function, immunological response and behaviour changes.

65. Consumption and wastage of home-fortified maize flour products in northern Malawi

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Introduction: Micronutrient deficiencies of vitamin A, iron, zinc and iodine are of major public health concern in the developing world, including Malawi. For 7 years, a home-fortification programme aimed at improving micronutrient nutrition has been implemented in Ekwendeni area in Mzimba district, Northern Malawi.

Objective: To determine the amount of home-fortified maize flour products consumed and wasted by women aged 15 to 49 years, and children under the age of 5 years, and their contribution to daily energy and micronutrient intake.

Methods: A descriptive cross-sectional study was conducted in Ekwendeni area in Mzimba district, Northern Malawi. Simple random sampling was used to select 205 rural households who were practising home fortification. Fortified nsima (a thick maize flour-based porridge) consumed and wasted was weighed using a scale. Using systematic random sampling, fortified maize flour and nsima samples were collected for energy, iron, zinc and vitamin Aanalysis from households. Data were analyzed using SPSS 16.0.

Results: There were 94 children (48.9% male, 51.1% female) and 173 women whose food intake and plate waste of fortified food products were collected. Predominantly, nsima (55.1%) was the main food product made from fortified maize flour; other foods were porridge and chigumu (a whole maize flour-based bread). Overall consumption of fortified foods (nsima, porridge and chigumu) by children was 332.0±1.8g/day; 1010.9 ±1.7g/day among women. Plate waste accounted for 24.5% of the food served to children, and 11.5% among women. Discarding fortified nsima resulted into 23.4% loss of energy and micronutrients among children, and 11.2% loss among women. Consumption of fortified nsima contributed 40.5% and 22.9% of daily energy and zinc requirements, respectively among children, and 73.2% of energy and 71.0% of zinc among women. Despite energy and zinc losses, the estimated dietary requirement for iron and vitamin A were met in both children and women.

Conclusion: Commonly consumed home-fortified maize flour products were nsima, porridge and chigumu. Plate waste of the fortified foods, primarily nsima resulted in considerable loss of energy and micronutrients, especially among children. The adequacy of iron and vitamin A was unaffected. Home-fortification interventions should include food budgeting to minimise food and nutrient losses among women and children in Northern Malawi.

Keywords: Home-fortification, Malawi, Micronutrients, Plate waste, Nsima

of energy and micronutrients, especially among children. The adequacy of iron and vitamin A was unaffected. Home-fortification interventions should include food budgeting to minimise food and nutrient losses among women and children in Northern Malawi.

Keywords: Home-fortification, Malawi, Micronutrients, Plate waste, Nsima

66. Effect of nutrition education on diabetes knowledge and attitudes of type 2 diabetics in Moretele, South Africa

Jane Muchiri, Gerda Gericke, Paul Rheeder
Egerton University - Kenya

Background: The knowledge and attitudes about diabetes and its treatment influences patients' self-management including dietary self-care.

Objective: To test the effect of a tailored nutrition education (NE) programme on diabetes knowledge and attitudes.

Setting: Two community health centres in a resource limited area (Moretele sub-district, North West Province, SA).

Methods: A NE programme based on previously assessed needs was conducted among adults with type 2 diabetes. Participants were randomised into either the intervention group (n=41; 8 weekly group education, follow-up sessions and written materials) or control group (n=41; written materials only). The groups were followed for 12 months. Diabetes Knowledge Form B assessed diabetes knowledge. Diabetes Attitudes Scale-III assessed diabetes attitudes. Outcomes were assessed at baseline, six and 12 months. An analysis of co-variance was done using baseline values, age, gender and clinic as covariates.

Results: 38 participants in each group completed the study. There were no significant group differences at baseline. Post-intervention, the differences in mean knowledge scores were + 0.95, p=0.033 at six months and +2.2,

p=0.000 at 12 months in favour of the intervention group. However, the mean scores were below half of the maximum score (15). For the diabetes attitudes, only the patient autonomy score at 12 months was significantly higher in the intervention group +0.3, p=0.016.

Conclusion: The tailored NE significantly improved diabetes knowledge in the intervention group, but not satisfactorily. The NE had limited effects on the attitudes towards diabetes. Further research is needed on the reasons for the unexpected results.

This research is supported by research grants from the South African Sugar Association and Nestlè Nutrition Institute Africa.

67. Evaluation of a nutrition education programme by type 2 diabetes adults in a resource limited setting in South Africa

Jane Muchiri, Gerda Gericke, Paul Rheeder
Egerton University - Kenya

Background: Participants judgment of a programme can influence their participation and consequent achievement of the intended goals. The information is useful in interpreting the results of an intervention.

Aim: To describe the views and experiences of adults with type 2 diabetes on/with a tailored nutrition education (NE) programme.

Setting: Two Community Health Centres (Moretele sub-district), North West Province (SA).

Study Design: Interpretive phenomenology (qualitative).

Participants: Thirty five type 2 diabetic patients (40-70 years) intervention participants of a clinical trial.

Method: A NE programme developed based on previously assessed needs and included the provision of education materials (pamphlet and fridge/wall poster) was implemented over one year. Five focus group discussions, using semi-structured questions assessed the participants experience with the programme at the end of 12 months. Framework approach (Kruger and Richie & Spencer) was used for data analysis.

Findings: Thirty eight of 41 participants (~93%) completed the NE programme. Participants indicated they enjoyed the programme and were satisfied with its content and delivery: meetings number, frequency and duration; group format and teaching aids/materials used. The education materials were seen useful for the whole family and as constant reminders for positive behaviour. Benefits indicated from participating included gain in knowledge and skills, positive changes in diet and improved health and family support. Participants recommended the programme for other patients.

Conclusion: A tailored NE programme can contribute to participants' satisfaction, perceived benefits and high participation rates. Provision of education materials should form part of a tailored NE programme.

Nestlè Nutrition Institute Africa, South African Sugar Association supported this work.

68. Perceived and reported dietary changes after nutrition education in adults with type 2 diabetes in Moretele South Africa

Jane Muchiri, Gerda Gericke, Paul Rheeder
Egerton University- Kenya

Aim: To describe perceived and reported changes in the intakes of starchy foods, vegetables and fruits by adults with type 2 diabetes (DM) after nutrition education (NE) intervention.

Setting: Two community health centres in Moretele, North West Province (SA).

Methods: 82 Type 2DM patients (40 to 70 years) participated in a one year randomised controlled trial. Intervention group (n=41) received group NE (8 weekly meetings; follow-up sessions; education materials). Control group received only the education materials. Three non-consecutive 24-hr recalls assessed dietary intake. A food change questionnaire assessed perceived dietary changes. Rank ANCOVA compared the groups for dietary intake (adjustments for baseline, clinic, gender and age). Wilcoxon matched paired sign rank tested within group changes. Chi squared test compared the groups on perceived dietary changes.

Results: 38 Participants per group completed the study. More intervention participants compared to the control group perceived themselves to having reduced starchy foods intake at six (40/41 vs. 31/40, p=0.006) and 12 months (38/38 vs. 35/38, p=0.08). This was confirmed for reported within group changes for starch servings intake at six and 12 months respectively [(baseline =12.3; 9.3 (p=0.000); 9.9 (p=0.000)] vs. [(baseline =11.8; 10.8 (p=0.07); 11.9 (p=0.3)] and between groups comparisons at the two time periods [9.3 vs. 10.8 (p=0.005); 9.9 vs. 11.9 (p=0.017)]. A greater proportion (>44%) in both groups perceived themselves to have increased fruits and vegetable intake, supported by within group changes for vegetable intake at six (p=0.001) and 12 months (p=0.003) for the intervention group, and fruit intake for the control group at 12 months (p=0.0001). No significant between groups' differences were observed in the perceived and reported intakes of vegetables or fruits.

Conclusion: Perceived dietary change could represent real dietary changes following an NE intervention, thus complementing quantitative reported intake; more research is needed.

This research is supported by research grants from Nestlè Nutrition Institute Africa & the South African Sugar Association.

69. Why caregivers do not adhere to exclusive breastfeeding recommendations

Lindelani Fhumudzani Mushaphi, Tjale Cloupas Mahopo, Cebisa Noxolo Nesamvuni, Pascal Bessong, Lindelani Fhumudzani Mushaphi
University of Venda

Introduction: There is enough evidence made that breastfeeding reduces the risk of diseases in infancy and later life. Efforts to promote breastfeeding have been conducted both in developing and developed countries. In South Africa, breastfeeding practices have been well documented with no improvements since 2003.

Objectives: The objective of this study was to determine reasons why caregivers do not adhere to proper infant feeding.

Methods: Study design was descriptive and exploratory. The research methods were qualitative. Four focus groups were used composed of thirty four caregivers with the average of eight in a group participated in the study. Semi structured interview schedule focusing of the perception of mothers on infant feeding of children aged 0-36 months. Thematic analysis was used.

Results: All caregivers initiated breastfeeding; however, the length of exclusive breastfeeding was too short. Some of the reasons given included insufficiency of breastmilk to satisfy the childs hunger, going back to work or school. Influence by the mothers-in law and grandmothers. They also view the length of breastfeeding as too long. When child cries too much food was used to calm the child down. Religious practice of giving the child water after a church ceremony was also an influence. Common cultural practice is to give Tshiunza from second month of age.

Conclusion: Exclusive breastfeeding was not adhered to because most mothers believe the baby is not satisfied with breastmilk only during the first six months. Cultural and religious practice plays a role on how babies are feed during the first few months after birth.

70. Low carbohydrate versus isoenergetic balanced diets for reducing weight and cardiovascular risk: a systematic review and meta-analysis

Celeste Naude, Celeste Naude, Anel Schoonees, Marjanne Senekal, Taryn Young, Paul Garner, Jimmy Volmink
Stellenbosch University

Background: Some low carbohydrate (CHO) weight-loss diets claim to be more effective, and have additional benefits in preventing cardiovascular disease compared to balanced weight-loss diets.

Methods: We compared low CHO and isoenergetic balanced weight-loss diets in overweight and obese adults, assessed in randomised controlled trials, and summarised effects on weight, cardiovascular and diabetes risk. We searched Medline, EMBASE, CENTRAL (19 March 2014). Analysis was stratified by outcomes at 3-6 months and 1-2 years. We evaluated dietary adherence and assessed quality of evidence using GRADE.

Results: Mean differences (MD) were calculated and random-effects meta-analysis performed. Nineteen trials were included (n=3209); 3 had adequate allocation concealment. In non-diabetics, our analysis showed little or no difference in mean weight loss in the two diets at 3-6 months (MD 0.74 kg, 95%CI -1.49 to 0.01 kg; I2=53%; n=1745, 14 trials; moderate quality evidence) and 1-2 years (MD 0.48 kg, 95%CI -1.44 kg to 0.49 kg; I2=12%; n=1025; 7 trials, moderate quality evidence). Little or no difference was detected at 3-6 months and 1-2 years for blood pressure, LDL, HDL, total cholesterol, triglycerides, fasting glucose (>914 participants). In diabetics, findings were similar.

Conclusions: Trials show weight loss in the short-term irrespective of whether the diet is low CHO or balanced. There is probably little or no difference in weight loss and changes in cardiovascular risk factors up to two years of follow-up when overweight and obese adults, with or without type 2 diabetes, are randomised to low CHO diets and isoenergetic balanced weight-loss diets.

71. Serum and dietary vitamin D in young adults living under seasonal solar UVB conditions

Celeste Naude, Anna Coussens, George Chaplin, Robert Wilkinson, Nina Jablonski
Stellenbosch University

Background: Solar ultra-violet B (UVB) exposure, diet and skin pigmentation influence vitamin D status. We aimed to determine seasonal vitamin D status and dietary vitamin D intake in healthy adults with moderate-to-dark skin pigmentation in Cape Town (latitude 34 degrees-South).

Methods: HIV-negative young (18-25 years) adults, darkly-pigmented (dark) (n=50) or moderately-pigmented (moderate) (n=50) were recruited for follow-up in summer and winter (6-weeks post-solstice). Serum 25-hydroxyvitamin D (25(OH)D) was determined and dietary D2 and D3 intake was estimated (quantitative food frequency). During the study period, UVB was measured and potential for UVB-induced conversion of 7-dehydrocholesterol (7-DHC) to pre-vitamin D3 was determined.

Results: Serum 25(OH)D decreased significantly ($p<0.001$) in both populations in winter versus summer, with no difference in mean 25(OH)D between populations in summer or winter. About 80% of participants in both populations had intakes less than the EAR for vitamin D (10 micrograms/day). There was no difference in daily intakes between populations in summer (dark median 5.3 micrograms, IQR 2.2-8.3; moderate median 5.9, IQR 2.8-9.5) or winter (dark median 4.2, IQR 1.9-6.5; moderate median 5.8, IQR 2.6-9.1). Preliminary UVB and 7-DHC conversion data indicate extreme seasonality of UVB regimes, with little to no potential conversion in May to July.

Conclusions: Healthy young adults with moderate-to-dark pigmentation living in a region with strong but seasonal UVB variation have reduced 25(OH)D levels in winter such that approximately two-thirds develop deficiency (25(OH)D <20ng/mL). UVB seasonality and low D2 and D3 intakes indicate the need for promoting improved intake of vitamin D, especially during winter.

72. Liver intake provides enough vitamin A to meet the requirements in 24 - 59 month old children from an impoverished Northern Cape community

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Department of Health

Introduction: Vitamin A deficiency (VAD) is a global health problem, resulting in millions of preventable deaths of children under five years of age.

Objective: To assess the contribution of liver to the vitamin A intake of pre-school children from an impoverished South African community where liver is frequently consumed and VAD was previously shown to be absent, but the prevalence of stunting high.

Methods: Vitamin A intake from liver was assessed in 150 children using a single 24-hour recall and quantified liver frequency questionnaire. Information on vitamin A intake via the national fortification programme was obtained from the 24h-recall, and information on vitamin A supplementation from the Road-to-Health Chart. Height, weight, and socio-economic data were also collected.

Results: Stunting, underweight and wasting were prevalent in 36.9%, 25.5% and 12.1% of children. Mean vitamin A intake from liver was 537 and

325 µg RE measured by the 24-hour recall and liver frequency questionnaire, respectively. Liver was consumed in 92.7% of households by 84.7% of children; liver intake was inversely related to indicators of socio-economic status ($p < 0.05$). The food fortification programme contributed 80 µg RE, and the vitamin A supplementation programme 122 µg RE to vitamin A intake.

Conclusions: Liver provided more than 100% of the Estimated Average Requirement of the pre-school children which challenges the notion generally held by international health bodies that VAD, poor anthropometric status, and poverty go together, and reinforces the fact that South Africa is a diverse country where targeted rather than blanket interventions are required.

73. School food vending has a potential in improving the rural households livelihood

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Introduction: Unemployment is one of South Africas most pressing socioeconomic challenges, affecting a quarter of the workforce and therefore aggravating poverty. This worse state of affairs with regards to livelihoods results in the influx of informal economic sectors. The concern is whether such businesses, like food vending, make a significant improvement in the livelihoods of vendors.

Objectives: To determine whether school food vending business contributes to the livelihood improvement of the rural households.

Methods: Sixty one school food vendors working at seven secondary schools from two circuits, Mvudi and Dzindi, took part in this study. Contribution of vending business toward household poverty alleviation was determined by measuring profit made against socioeconomic status of the households.

Results: The profit made from the vending business by about 70% vendors ranged from R2230.00 to R4560.00 per month. The money was also used to buy the basic necessities for the households by 29.5% of vendors. Most vendors (65.6%) managed to save money and this may be due to many financial streams in the households such as grants and pension funds. Furthermore, school food vending was not the only income generating activity done by the participants.

Conclusion: With sufficient financial and social support school food vending as an informal business could be a valuable strategy of the poor to improve their livelihoods.

Keywords: vending, vendors, livelihood, rural households, poverty

74. Interactions between C-reactive protein genotypes with markers of nutritional status in relation to inflammation

Dr Cornelie Nienaber-Rousseau, Bianca Swanepoel, Robin Dolman, Marlien Pieters, Karin R Conradie, G Wayne Towers
North-West University

Background: Inflammation, as indicated by C-reactive protein concentrations ([CRP]), is a risk factor for chronic diseases. Lifestyle interventions involving diet are deemed anti-inflammatory; however, it is unknown whether these factors interact with single nucleotide polymorphisms (SNPs) within the CRP gene to influence inflammation.

Methods: We determined 12 CRP SNPs and specific nutrition status markers in 2010 black South Africans and analysed their effect on [CRP] cross-sectionally.

Results: Anthropometrical markers were determined to increase the effects of certain CRP SNPs (rs1130864, rs3093058 and rs3093062) in relation to inflammation. HbA1c and fasting glucose interacted with several genotypes (rs3093058, rs3093068, rs1205, rs7553007, rs2794520, rs2808630, rs3093062, rs2027471 and rs1341665) thus altering the inflammatory response. Various genotypic interactions with dietary components were observed, several of which were surprising. When homozygous for the variant allele at rs2808630, increased MUFA intake resulted in a more pro-inflammatory state. When carrying the rs3093062 variant allele, increased omega-3 intake heightened [CRP] whereas the reverse was true for the variant allele at rs3093068 in relation to omega-6 intake. When homozygous for the rs1130864 variant allele, increased fruit and vegetable intake raised [CRP]. Increased carotenoid intake and gamma-glutamyl transferase concentrations in those harbouring the variant allele at rs1417938, resulted in a more pro-inflammatory state.

Conclusion: Thus genetic factors do interact with markers of nutritional status, strongly affecting the systemic inflammatory state.

75. The influence of Couple-counselling and Maternal-counselling on early breastfeeding feeding practices in Nyando District, Kenya

Irene Ogada, Sophie Ochola, Zandile Mchiza, Rosebella Onyango, Florence Olweny
Kenyatta University

Introduction: Studies have demonstrated the health and nutritional benefits of initiation of breastfeeding within 1 hour of delivery, giving of colostrum, giving no prelacteals and/ or postlacteals, and exclusive breastfeeding.

Objective: To test the effectiveness of 'Couple-counselling' and 'Maternal-counselling' in promoting optimal early breastfeeding practices, in Nyando district, Kenya.

Methods: A cluster-randomised trial among 278 'pregnant' couples randomly assigned to couple-counselling (n=90), maternal counselling (n=87) and control (n=101) groups. At 37-40th weeks gestation, a pre-natal counselling session on early infant feeding was done to both mothers and fathers in the couple-counselling group and mothers only in maternal-counselling group. Data on infant feeding was collected one week post-partum. Infant feeding practices were compared using Fisher's exact test and odds ratio.

Results: There were significant difference in initiation of breastfeeding within 1 hour of birth among study groups; couple-counselling (100%), Control (95.2%) and maternal counselling (93%) (Fisher's exact test; $p=0.026$). No significant differences were observed on use of prelacteals (Fisher's exact test; $p=0.756$). Significant differences were seen in giving of post-lacteals; 14.3% in control, 1.2% in maternal-counselling and 1.1% in couple-counselling (Fisher's exact test; $p<0.001$). Maternal-counselling were more likely (OR: 5.34; CI 1.51-18.91; $p=0.009$) than control to be exclusively breastfeeding at 1 week, as was couple-counselling group (OR: 8.50; CI 1.91-37.89; $p=0.005$).

Conclusion: Couple-counselling led to higher improvements in early breastfeeding practices than maternal-counselling.

Keywords: Initiation of breastfeeding, prelacteals, postlacteals, couple-counselling, maternal-counselling, Nyando District

76. Knowledge, attitudes and lifestyle practices of hypertensive patients in a Nigerian tertiary hospital

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Introduction: Hypertension is a disease of public health importance in Nigeria and assessing the knowledge, attitudes and practices(KAP) of lifestyle modification is a crucial factor in achieving blood pressure control among the hypertensive patients.

Objective: To assess the KAP of hypertensive patients regarding lifestyle modification in controlling blood pressure.

Methods: Descriptive cross sectional study was carried out among 206 randomly selected hypertensive patients at the University College Hospital, Ibadan, Nigeria. Sociodemographic characteristics and KAP of the respondents were assessed using pretested interviewer administered questionnaire. Respondents who scored below 50th percentile were considered as having inadequate knowledge, negative attitude and poor lifestyle practices and vice versa. Data were analysed using descriptive statistics and inferential statistics to compare variables. Level of significant was set at 1% and 5%.

Results: Mean age of the respondents was 58.10±11.63years. Majority (62.6%) were females, 79.2% were above 50 years of age, 51.0% were overweight, 24.8% were obese and 66.5% were in grade I hypertension. Significant proportion(60.7%, 65.5%) had inadequate knowledge of lifestyle modification and poor lifestyle practices respectively($p<0.05$). Significant negative and weak association was observed between lifestyle practices and body mass index($r=-0.164$;$p<0.05$) while a significant positive and weak association was observed between knowledge of lifestyle modification and lifestyle practices($r= 0.234$, $p<0.01$). Respondents with adequate knowledge are likely to show 3 times positive attitudes towards lifestyle modification(OR=3.32, 95%CI=1.80- 6.11).

Conclusion: Knowledge on lifestyle modification to control blood pressure was inadequate, attitude was negative and lifestyle practices was poor. Adequate knowledge on lifestyle modification could influence positive attitude and good lifestyle practices.

77. Resting energy expenditure of black and white overweight women aged 18 to 55 years

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Introduction: Overweight is a global problem also affecting South Africa. International studies suggest lower resting energy expenditure (REE) in black than in white populations. The difference has implications for management of overweight, including estimations of REE.

Objectives: To determine whether measured REE and fat-free mass (FFM) among overweight women differed significantly between black and white participants, and to determine performance of REE estimation equations.

Methods: An observational, cross-sectional study compared REE of 44 black and 41 white overweight women (18-55y; body mass index [BMI] ≥25kg/m^2). REE was measured using Quark RMR indirect calorimetry, and estimated using ten different equations. Body composition was assessed using Bodystat Quadscan 4000. The race/ethnicity groups were compared using the Welch t-test, and measured REE was compared using analysis of variance, adjusting for FFM and BMI.

Results: Mean BMI was 35.1kg/m^2 and 33.9kg/m^2 for black and white participants, respectively ($p=0.38$). Measured REE was 585kJ/day lower in black than in white women ($p=0.0001$). Similarly, FFM was 4.52kg lower in black participants ($p=0.0005$). Most equations underestimated REE. Equations using FFM or race/ethnicity picked up a significant race/ethnicity difference in REE ($p\leq0.01$).

Conclusions: Black overweight women have significantly lower REE and FFM. No tested estimation equation provided satisfactory REE results in this population, and adding overweight or race/ethnicity to equations should be considered. Individual REE measurements or development of overweight- or race/ethnicity-specific estimation equations are recommended for good management of overweight.

Keywords: REE, FFM, race/ethnicity, overweight

78. Maternal BMI and Pregnancy Outcome among Women Who Delivered at Federal Medical Centre, Bida, Nigeria

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Post-graduate student at University of Ibadan

Introduction: Inadequate weight gain in pregnancy is a known risk factor for poor pregnancy outcome and thus of public health concern. This study was designed to assess the association between maternal BMI and pregnancy outcome among women at Federal Medical Centre, Bida, Niger State, Nigeria.

Method: A retrospective review of 1037 case notes of women who obtained antenatal care and delivered at Federal Medical Centre Bida, Niger state, Nigeria from January 2005 to December 2009 was conducted. A record review guide was used to obtain socio-demographic, obstetric information, weight at booking, second and third (delivery) trimesters . Infant birth weights were also obtained. Data analysis was done and presented by descriptive statistics, Chi-square, and logistics regression at 5% level of significance.

Results: The age of the mothers ranged between 15-50years with the mean of 25.7±5.1years. The mean weight gained in pregnancy was 6.7±4.1kg for the pregnant women. Their mean BMI in pregnancy was (27.9± 4.9kg/m^2). Underweight mothers are about 27 times more likely to have LBW infants than normal weight and overweight/obese mothers ($p<0.05$). Mean infant birth weight 3.1±0.5kg. The proportion (9.5%) of low birth weight (LBW) infants was significantly higher among younger mothers (15-19 years) compared to (7.1%) to older women (20-50 years).Primiparous mothers were about 0.5 times unlikely to have macrosomia than multi and grandmultiparous mothers ($p<0.05$)

Conclusion: Teenage conception, low BMI and parity were observed to be associated with low birth weight.

Keywords: Maternal weight gain, Pregnancy outcome, maternal BMI, Infant birth weight.

79. Iodine status of breastfed infants aged 2-4 months and their mothers in a South African Township

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North-West University

Introduction: Iodine deficiency is the leading cause of preventable mental retardation worldwide. Lactating women and infants are susceptible to iodine deficiency disorders. However, in South Africa, no data exist on the iodine status of lactating mothers and their infants.

Objectives: To assess breast milk iodine concentrations (BMIC) and iodine status of lactating women and their breastfed infants from a peri-urban township in the North West Province, and the relative contribution of iodine in salt (SIC) and water (WIC).

Methods: Using a cross-sectional study design, we measured iodine concentrations in the urine of 100 infants aged 2-4 months and their mothers, in breast milk (n=65) and in household water and salt.

Results: Median (m) UIC of infants (373µg/l) and their mothers (118µg/l) were sufficient. Infant UIC correlated with maternal UIC (rs=0.341; P=0.001). mBMIC was 225µg/l (n=65), and BMIC correlated with the UIC of infants (rs=0.582, P<0.001) and mothers (rs=0.376, P=0.02). WIC were below detection limit and mSIC was 44.1µg/g. UIC of mothers and infants were associated with SIC (rs=0.299; P=0.006 and rs=0.341; P=0.002, respectively). The mUIC of infants from households who consumed "over-iodized" salt (>65ppm; 21%) were markedly higher (719µg/l) than from households who consumed salt with adequate (35-65ppm; 42%) (346µg/l) or inadequate SIC (<35ppm; 37%) (250µg/l).

Conclusions: Our results suggest that the salt iodization program in South Africa supplies sufficient iodine to lactating mothers and their infants. However, better monitoring of the salt iodization process is needed to avoid "over-iodization" of salt, which may cause iodine overload in infants.

80. Perception and understanding of dietary fats amongst South African nurses

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Unilever

Background and Objectives Nurses are the main point of access for the community (Douglas-Sweet 2008). The objective was to assess nurses current understanding and perception on fat as well as their knowledge on the nutritional value of margarine and to measure any changes post an educational print campaign.

Methods: A telephonic survey was conducted to gather data on nurses and measure their knowledge of good/bad fats before and after they were exposed to an educational print campaign. The call to action for the survey was in the monthly nursing update magazine.

Results: Only those nurses that did both the pre and the post survey were included in the results (N=1400). There was a good spread between age and geographical location of the nurses.

Post the inserted educational leaflet there was an improvement in claimed difference between a good fat and a bad fat (79% and 86% respectively). Nine out of ten nurses recommend margarine to their patients, if they didnt recommend margarine the reason was because of high cholesterol. Nurses with less experience seem to be more updated with the difference between good and bad fats.

Conclusions: Nurses already had a good deal of knowledge in the area of fats and nutrition. Movement of knowledge from the pre and post survey demonstrated that an educationalprint campaign had a positive educational impact with the nurse. Using the nurses update as a communication channel can be an effective way to up skill the nurse on nutrition related topics.

81. Nutritional Status of School Children and Adolescents in Cofimvaba, South Africa

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Background: South Africa, like other middle income countries, is undergoing nutritional transition with triple burden of malnutrition: under-nutrition, over-nutrition and HIV/AIDS. This has greatly affected the nutrition and health of South African children.

Objectives: To determine the prevalence of stunting, underweight and overweight/obesity among learners aged 6-18years in Cofimvaba, South Africa.

Methods: A cross sectional study was conducted on 212 learners randomly selected from five public schools in Cofimvaba. Weight, height, mid upper arm circumference and Triceps skin fold thickness (TSFT) were determined by standard techniques. Body mass index (BMI) was calculated from weight and height and % body fat from MUAC and TSFT.

Results: Of the 212 learners (aged 6-18years) studied, 2.8% (2.8% girls and 4.9% boys; p>0.05) were stunted and none was under-weight. Compared to children with normal stature, prevalence of wasting was significantly higher in stunted children (3.2% versus 20%; p=0.000). Overall 1.9% (1.8% girls and 2.0% boys) of the learners aged 6-19years were underweight, 14.8% (21.1% and 7.8% boys) were overweight and 2.8% (4.6% girls and 1.0% boys) were obese. The prevalence of overweight and obesity was significantly higher (p<0.05) in girls than boys during adolescence but no gender difference (p>0.05) was observed in children aged 6-9years. Most (80.6%) of the learners had normal weights with boys (89.2%) being significantly higher (p=0.014) than girls (72.5%).

Conclusion: The study found a low prevalence of stunting and underweight with a relatively higher prevalence of overweight among the studied learners in this community.

82. Nutritional screening of HIV-infected students at NMMU: Are they at risk?

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NMMU

Introduction: The current prevalence of human immunodeficiency virus infection (HIV) on campuses in South Africa is 3.4%. The nutritional status of HIV-infected students may impact on health, well-being and learning outcomes.

Objective: The objective of this study was to describe nutritional risk among HIV-infected students registered at the NMMU.

Methods: HIV-infected students (n=64) were admitted to this descriptive study after giving informed, written consent. Ethical approval was obtained from the Research Ethics Committee. A nutritional screening was performed by a trained, registered dietitian which included demographic, anthropometric, clinical information and usual food intake.

Results: At the time of screening students in the sample had a mean CD4 count of 411 cells/mm3 (SD = 219.9), a mean BMI of 28.05 (SD = 7.9) and only half of the students (n=31) were on antiretroviral therapy. A higher BMI (> 25) was significantly (p<.05; V=0.32) associated with higher CD4 cell counts (>350 cells/mm3). The mean estimated energy intake was 29.6 kcal/kg (SD = 11.6). Reported energy intakes differed significantly (p=0.008) between BMI groups. Forty percent (n=25) of students were identified as being at risk for metabolic complications based on their waist circumference and 11% (n=7) had signs of lipodystrophy.

Conclusion: The immune status of HIV-infected students seem to be affected by a BMI <25; however, almost half of the sample was at risk of metabolic complications which may lead to faster progression to lipodystrophy. Careful approaches towards dietary and lifestyle interventions is necessary to minimize deterioration of immune status.

Keywords: HIV, students, macronutrients, nutrition risk, metabolic risk

83. Understanding fruit and vegetable consumption: A qualitative investigation in the Mitchells Plain sub-district of Cape Town

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JB Consultancy

Objectives: Many South Africans do not consume enough fruit and vegetables. However, people are generally aware of the benefits of adequate consumption. To understand this gap between knowledge and practice, this study investigated underlying factors influencing consumption through a qualitative, cross-sectional, descriptive case study conducted in Mitchells Plain, Cape Town.

Methods: Four focus groups to gain broad understanding and 15 interviews with strategically selected individuals influential in food preparation, distribution or consumption, to gain in-depth understanding of specific factors influencing fruit and vegetable consumption were conducted.

Results: The study identified a number of drivers of fruit and vegetable consumption patterns. Barriers to consumption included perishability and affordability; that fruit/vegetables are not considered priority food items (inadequate time and effort is allocated to purchasing and preparation); reported negative side-effects of consumption, and that health benefits are not immediately apparent. Consumption was facilitated by personal preference, traditional dishes that include fruit/vegetables, increased availability of fruit/vegetables and discipline in children. Suggestions to improve consumption included providing practical advice to decrease preparation time and cost, and recipes to increase appeal of fruit/vegetable dishes. However, this needs to be understood in the context of the bigger structural issues that help or hinder fruit and vegetable consumption. **Conclusions:** Limited fruit and vegetable consumption is not simply determined by limited nutrition knowledge or poor decision making by households, but rather by a much wider set of social, economic and spatial processes. Innovative behaviour change strategies to increase consumption that take cognisance of wider structural barriers to consumption are required.

84. Obesity and health problems among Healthcare Professionals two public hospitals, Mpumalanga province, South Africa

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Background and objectives: Obesity has been cited as a public health problem in both developing and developed countries. The prevalence of obesity is continually rising. It has increased due to globalisation which has exposed people to sedentary lifestyles and obesogenic environments. Evidence shows that the prevalence rates of obesity have increased among the Healthcare Professionals. The objectives of the study was to determine the prevalence of obesity and health problems among Healthcare Professionals; and further compare the health parameters between Healthcare Professionals that perform day versus night duties.

Methods: The study design entailed a cross–sectional survey among 210 Healthcare Professionals that were sampled according to their disciplines (stratified sampling). The data was collected using self-administered questionnaires and anthropometric measurements such as weight and height were objectively measured. The following parameters were assessed: prevalence of obesity & related diseases, dietary practises, bodyweight perceptions and physical activity. The results were analysed using SPSS version 20.0.

Results: The sample comprised of (82.4%) females, mainly blacks (83.8%). The mean age was 37.76 yrs. The majority of the participants were residing in urban areas. About half (51.9%) of the Healthcare Professionals were obese and 21.4% were overweight. 55.7% of the participants were physically active and 31.4% reported barriers to physical activities. There was significant association between BMI classification and gender (P=0.010), age (P=0.00), race (P=0.00) and education (P=0.00).

Conclusion: There was high prevalence of obesity among Healthcare Professionals. The commonest predictors of obesity were female gender, urbanisation, African culture, obesogenic food, sedentary lifestyle, low level of education and night shift.

85. The role of community support in adoption of improved complementary feeding practices in rural Malawi

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Natural Resources College, Malawi

Introduction: Nutrition education (NE) to improve infant and young child feeding (IYCF) practices often only targets mothers of young children. FAO-Malawi implemented NE sessions in Kasungu and Mzimba districts targeting primary caregivers of children 6-8 months and selected grandmothers, spouses and village headmen. The trained volunteers conducted the community mobilization to select participants and facilitated the 10 NE sessions on breastfeeding, hygiene and childrens diet.

Objective: To assess the role of other community members in caregivers adoption of improved complementary feeding practices.

Methods: Focus group discussions (FGDs) were conducted two months after NE sessions in two local languages among caregivers and grandmothers separately in four villages (total = 8). FGD had six to ten participants each. Audiotapes of FGDs were transcribed using Maxqda 11 software. Data was analyzed using content analysis.

Results: The results from the FGDs showed that spouses, grandmothers and non-family members (NFMs) who participated in the NE sessions or the community mobilization, motivated the caregivers to attend the sessions. Grandmothers encouraged caregivers to prepare enriched porridge while the spouses purchased ingredients for the enriched porridge. However, Spouses, grandmothers and NFMs in villages not well informed about the NE program, discouraged caregivers from preparing enriched porridge with fish and vegetables because of flavor and color.

Conclusions: Intensive community mobilization to promote improved IYCF practices must be conducted prior to the commencement of NE sessions to ensure that caregivers attendance and resulting behavior change is supported.

Keywords: Nutrition Education, IYCF, Community mobilization, Behavior Change, Malawi

86. The necessity of food composition data to determine dietary iron absorption

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Introduction: Dietary studies have led to increased interest in biologically active constituents present in foods. When reporting, no reference is made to the specific type of iron found in food sources. A single reference of total iron intake does not indicate the amount of iron that is absorbed, as the type of iron, inhibitors and enhancers of a meal have an influence on iron absorption.

To illustrate the importance of a heme iron database considering the contribution of South African meat to total iron absorption.

Methods: Triplicate samples of raw commonly consumed meat (beef, lamb, pork and chicken) were analysed for total iron using atomic absorption spectrophotometry and heme iron using an adapted Hornsey method. Relative iron absorption was calculated using a constant value as well as analysed value for heme iron.

Results: Beef (TFe=2.46±0.41; HFe=1.97±0.19) and lamb (TFe=1.65±0.12; HFe=1.26±0.39) meat have the highest total iron (TFe) and heme iron (HFe) content with chicken (TFe=0.75±0.11; HFe=0.57±0.13) and pork (TFe=0.76±0.09; HFe=0.64±0.08) meat having the lowest values. The percentage heme iron (%HFe) for beef (81%), lamb (75%), chicken (76%) and pork (84%) was higher than the constant value.

Conclusion: The meats in this study contain higher percentage heme iron (>75%) than was used in the Monsen model (40%) to estimate iron availability. More detailed food-composition tables are needed. The lack of knowledge of the presence of different factors in foods is even more obvious when the availability of dietary iron is determined in indigenous foods.

Keywords: Food composition, Heme iron, meat

87. Impact of a nutrition education intervention on usual food intake of women in Lesotho

Mamotsamai Ranneileng, Corina Walsh, Andre Dannhausser, Riette Nel
National University of Lesotho

Introduction: Nutrition education intervention was designed and used as an experiment to promote healthy eating among Basotho women aged 19-60 years of age.

Objectives: To evaluate the impact of a nutrition education intervention on usual food intake of women in Lesotho.

Methods: A randomized pre-test-post-test control group nutrition education intervention was carried out among 451 women aged 19 – 60 years in rural and urban areas in Lesotho. Participants were selected according to their villages and were randomly assigned to control (n = 206) and experimental (n = 245) groups. The intervention framed on the guidelines of the Food Guide Pyramid (FGP) and the South African Food Based Dietary Guidelines (SAFBDG) was implemented in the experimental group after usual food intake was assessed in both the control and experimental groups. Dietary intake was assessed with a short food frequency questionnaire (FFQ) before and six months after the intervention in both groups. The existing women's group structures in the villages were used as a mechanism for follow up during the six month period.

Results: After intervention, 105 and 154 women in the control and experimental groups respectively were assessed. Some significant improvements occurred in women's intake of the traditionally consumed foods in experimental groups compared to the control groups. For example, everyday consumption of *papa* made from unrefined maize meal (41.2% - 52.6% [CI = 22.2:37.0]); and brown bread (33.1% – 62.3% [CI = 7.7:37.0]) improved significantly, while everyday intake of white bread fell from 13.1% to 1.9% ([CI = -16.5: -5.3]). However, no significant improvements occurred in the regular intake of not so commonly consumed foods including whole wheat bread (0.9% - 11.0% [CI = 1.0:10.0]); and brown rice (2.5% - 3.3% [CI = 4.4:4.4]).

Conclusion: The study established that using the FGP and FBDG approach to nutrition education can be used successfully to improve food intake in Lesotho.

88. Impact of a nutrition education intervention on nutrition-related self-efficacy and locus of control

Mamotsamai Ranneileng, Corina Walsh, Andre Dannhausser, Riette Nel
National University of Lesotho

Introduction: Nutrition education was designed to be strategic and facilitative, and was guided by theories of health behaviour.

Objectives: To evaluate the impact of a nutrition education intervention on nutrition-related beliefs informed by self-efficacy theory and locus of control among women in Lesotho.

Methods: A randomized controlled pre-test-post-test design was adopted to implement a nutrition education intervention in experimental groups among 444 women aged 19-60 years. Villages were randomly assigned to control (n = 206) and experimental (n = 245) groups. A baseline assessment was carried out before and six months after the intervention. Nutrition-related self-efficacy and locus of control were assessed using a knowledge, attitudes, beliefs and practices (KABP) questionnaire. Participants were followed up using the existing women structures in the villages.

Results: After intervention, 105 and 154 participants in the control and experimental groups respectively were assessed. Some significant improvements occurred in women's nutrition-related self-efficacy beliefs and locus of control in experimental groups compared to the control groups. For example, before intervention, 64.5% participants in the experimental group had dried beans in their houses. After intervention, this percentage increased to 93.6% (95% CI for the percentage difference [25.5; 40.7]).

In locus of control, the belief that illness and health were not caused by luck, fate or chance improved significantly in the experimental group after intervention (95% CI for the percentage difference [-59.0; -42.9]).

Conclusion: Results show that theory-based nutrition education intervention programme can be used successfully in Lesotho to improve nutrition-related beliefs in self-efficacy and locus of control.

89. Dietary ALA is positively associated with plasma DHA in South African men and women: the PURE study

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North-West University

Background: Previous studies showed that the conversion of the essential n-3 fatty acid alpha-linolenic acid (ALA) to eicosapentanoic acid (EPA) and docosahexanoic acid (DHA) is limited in humans and affected by diet and gender. Animal studies show that this conversion is also inhibited by high EPA and DHA intake. Dietary ALA might be an important contributor to plasma EPA and DHA in populations with low preformed EPA and DHA intake (e.g. from fish).

Objective: We investigated the total phospholipid fatty acid composition in a subsample from the PURE study and looked at associations between dietary fatty acid intake and plasma fatty acid composition.

Methods: Cross-sectional data analysis within the PURE baseline study of healthy subjects (n=800, 35–70 years) from rural and urban areas. Dietary data were collected and plasma total phospholipid fatty acid extraction and isolation performed.

Results: Associations were found between dietary intake and plasma fatty acid composition levels for the following fatty acids: myristic acid (C14:0) (males, r=0.16, p=0.008; females r=0.13, p=0.007), palmitic acid (C16:0) (females r=0.18, p<0.001), EPA (males r=0.19, p=0.002, females: r=0.10, p=0.042) and DHA (males r=0.21, p<0.001). Dietary ALA was positively correlated with plasma EPA (males r=0.19, p=0.002, females r=0.25, p<0.001) and DHA (males r=0.33, p<0.001, females r=0.30, p<0.001).

Conclusions: A higher percentage of ALA might be converted to DHA in this population with low intake of essential and long chain polyunsaturated fatty acids than in populations with a high intake of these fatty acids.

90. Nutrition in food policies for South Africa

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University of Pretoria

Introduction: South Africa is food secure at national level with enough energy produced by the food system to feed the whole population. Yet, many individuals in South Africa suffer from the consequences of poor and/or inappropriate diets. Recognizing the role of the food system to improve overall nutrition outcomes remains a challenge.The objective was to describe the nutrition sensitivity of the South African food system through a review of the strengths and shortcomings of the current policy environment.

Methods: Previous, existing and proposed policies and programmes (n=17) by various sectors were scored against the Food and Agriculture Organizations guiding principles on agricultural programming for nutrition. Interviews with stakeholders (n=29) were conducted and questionnaires (n=35) administered. The review formed part of a country policy analysis for the Standing Committee on Nutrition of the United Nations.

Results: Nutrition is understated in most existing policies related to the South African food system. Nutrition-sensitive approaches (which are needed to enforce and improve the impact of existing nutrition strategies) from various sectors of the food system are limited. There is a lack of indicators for nutrition in national governance promoting diversification, as well as nutrient quality and density in food production, processing, storage, distribution, marketing and education.

Conclusions: Measuring the availability of dietary energy has not been effective in improving the nutritional status of the population. A stronger focus on the nutrition-sensitivity of the whole food system is required, with agriculture, social development, trade and education better supporting existing nutrition (health) strategies.

91. Narratives of urban female adolescents in South Africa: dietary and physical activity practices in an obesogenic environment

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Objectives: The objectives of this study were to investigate the narratives pertaining to dietary and physical activity practices among female adolescents in Soweto.

Design: Exploratory qualitative research using duo-interviews (n=29 pairs of best friends) from adolescent females.

Setting: Three urban high schools in the township of Soweto, South Africa.

Subjects: 29 pairs of predominantly Grade 12 female adolescents, mean age 18 years (15.3-21.6; SD 1.1)

Outcome measures: Body mass index interpreted in relation to eating practices and exercise participation.

Results: Local prepared convenient foods have been reported to replace home prepared breakfast and dinner meals. The majority of participants did not prioritise eating breakfast at home, but purchased deep fried dough balls (fat cakes) from vendors before school. Lunchboxes were also not commonly used as participants preferred to have spending money to purchase food from the school shop. The kota, fat cakes, and snacks were popular lunch choices due to their affordability, convenience, peer influence, and popularity. Respondents reported minimal active recreational activities. Barriers to activity were a lack of facilities and concerns about community safety.

Conclusions: This study highlights the importance of investigating the immediate social context as potential intervention points to improving lifestyles of adolescents, so as make the healthier choice, the easier choice.

Keywords: Adolescent, eating, consumption, nutrition, physical activity, obesity, urban, South Africa

92. Influencing the media to print accurate information on sugar

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South African Sugar Association

Objective: To investigate the effect of influencing editors perceptions of sugar and health on the manner in which sugar is portrayed in their respective publications over a twelve month period.

Method: A list of publications printing grossly inaccurate information on sugar and health in 2012 was collated using press clipping service. Ten publications were identified, with magazines targeting women being in the majority. In 2013, face to face meetings were held with the editors and journalists of these publications. The purpose of the meetings was to establish their perception of sugar and positively influence their perception of sugar using accurate science based information. Over a twelve month period these publications were monitored for the accuracy of articles containing information on sugar and health. A press clipping service was used to ensure that all articles referring to sugar were captured.

Results: Journalists and editors views of sugar were mixed. Three felt that it was addictive, two thought it should be limited and five indicated that it can be included in a balanced diet. Post the meetings, one out of the ten publications targeted printed one grossly inaccurate article on sugar. Two publications printed two articles pertaining to sugar only, with the information being balanced and accurate. The other publications confined their comments to sugar being part of a healthy diet but in limited amounts.

Conclusion: Using science based accurate information to influence editors and journalists writing in the lay press can result in accurate information being printed in their publications.

93. Actual and perceived health (NCDs) in teachers of primary school learners in the Western Cape province (Health Kick Study)

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Background: Non-communicable Diseases (NCDs) are major health concerns in South Africa. According to the life cycle approach NCD prevention strategies should target children. Teachers are important external factors influencing behaviour of learners.

Objective: To assess the prevalence of select intermediate NCD risks and associated factors in teachers of primary school learners.

Methods: A cross-sectional design was used to assess the BMI and waist circumference (WC), blood glucose (BG), cholesterol (BC) and pressure (BP), perceived health and weight, and parental NCD history of 517 teachers.

Results: The sample included 40% males and 60% females; 64% urban and 36% rural, 87% were mixed ancestry, 11% white and 2 % black. Mean age for the total group was 52±10.1 years, BMI 30±1.15kg/m^2 (31% overweight, 47% obese), diastolic BP 84±10.0mmHg, systolic BP 134±18.7mmHg (46% high BP), BG 4.6±2.3mmol/L (2% high BG), BC 4.4±0.85 (30.4% high BC) and WC 98±14.1cm for males (38% high WC) and 95±15.3 for females (67% high WC). BMI was higher (p=0.000) and systolic (p=0.00) and diastolic (p=0.005) BP lower in females. Rural teachers were more obese (p=0.00). BMI (p=0.001) and systolic BP (p=0.000) were lower in younger teachers. Correct awareness of personal health was 65% for BP, 79.2% for BC and 53.3% for BG. 38.4%

overweight/obese females and 32.6% males perceived their weight as normal. High BP was the most commonly reported condition for parents.

Conclusion: Intermediate NDC risks are common among primary school teachers and need to be addressed.

94. Weight status and lifestyle factors in a random sample of grade 8 and 9 male and female adolescents in the Cape Metropole stratified by socio-economic status

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University of Cape Town

Introduction: Weight problems ranging from eating disorders to obesity among adolescents remain a concern.

Objective: Formative assessment of a random sample of male (total=608; black=272, mixed ancestry=287, white=49) and female (total=646; black=294, mixed ancestry(MA)=303, white=49) adolescents stratified by socio-economic status.

Methods: Height, and weight were measured and BMI calculated. BMI-for-age Z-score and height-for-age Z scores were interpreted with 2007 WHO cut-points. Exercise/sport and food choices were assessed using a standardized self-administered questionnaire.

Results: Mean(SD) age ranged from 13.98(0.72)-15.13(1.42). White (0%) and mixed ancestry(MA) (5.6%) males were less likely to be stunted than black males (13.4%). The same was true for females (white=0%;MA=3.9%;black=7.1%). Underweight/wasting was more common among black (16.9%) and MA (17.0%) than white males (2.0%) and more common among MA (6.9%) than black (4.1%) and white (0%) females. Overweight/obesity were more common in white (overweight=12.2%;obesity=0%) and MA (overweight=5.6;obesity=1.3%) males than in black males (overweight=2.6%;obesity=1.1%). Black females were more likely to be overweight/obese (overweight=13.3%; obesity=3.7%) than MA (overweight=6.9; obesity=1.7%) and white (overweight=6.1%; obesity=2.0%) females. Most common sport/exercise for fun (F) and competitive (C) was soccer for black (F=75.5%;C=61.3%) and MA (F=73%; F=21.1%) and rugby (F=54%; C=52%) for white males. Dancing was most popular for fun for all females (black=57.1%, MA=59.9%;white =57.1%) and netball for competitive (black=57.1%, MA=59.9%;white =57.1%). Black adolescents were more likely to eat chicken, bully beef, liver, starches, vegetables; MA adolescents polony, white bread, milk, coke and chips; white adolescents cheese, sugar, chocolate and fruit juice.

Conclusion: Prevalence of underweight (black /MA males), stunting (black males/females) and overweight/obesity (black females/white males) indicates the need for targeted interventions.

95. Dietary Inflammatory Index predicts pancreatic cancer in an Italian case-control study

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Cancer Prevention and Control Program

Background: Previous studies have shown that various individual dietary components may be implicated in the etiology of pancreatic cancer and not much has been done to look at the effect of diet as a whole. The possible relation between inflammation deriving from dietary exposures and pancreatic cancer risk has not yet been investigated.

Methods: We examined the ability of a newly developed population based literature derived dietary inflammatory index (DII) to predict pancreatic cancer incidence in a case-control study conducted in Italy between 1991 and 2002. Cases were 326 incident pancreatic cancer cases and controls

652 frequency-matched controls admitted to hospital for non-neoplastic diseases. DII was computed based on dietary intake assessed using a previously validated and reproducible 78-item food frequency questionnaire. Logistic regression models were used to estimate multivariable odds ratios (OR) adjusted for age, center, education, gender, body mass index, smoking, diabetes, alcohol consumption and energy adjustment was done by using the residual method.

Results: Subjects with higher DII scores had a higher risk of pancreatic cancer risk using DII as both continuous (OR = 1.24, 95 % confidence interval, CI, 1.11-1.24) and categorical, i.e., compared to subjects in the lowest quintile of DII men in second, third, fourth and fifth quintiles were at elevated risk (ORQuintile2vs 1 = 1.70, C.I= 1.02-2.80; ORQuintile3vs 1 = 1.91, C.I = 1.16-3.16; ORQuintile4vs1 = 1.98, C.I = 1.20, 3.27; ORQuintile5vs 1 = 2.48, C.I= 1.50-4.10) compared to men in the lowest quintile of DII (Ptrend = 0.0015).

Conclusion: These data suggest that a pro-inflammatory diet, as indicated by increasing DII score, may be a risk factor for pancreatic cancer incidence.

96. Anaemia prevalence of breast-fed infants and their mothers from a peri-urban area in South Africa

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Introduction: Anaemia during infancy can cause impaired growth and cognitive development. Limited data is available on the prevalence of anaemia in breast-fed South African infants and their mothers.

Objectives: To assess the anaemia prevalence of breast-fed infants and their mothers from a resource-poor setting, and to explore factors associated with the infants' haemoglobin (Hb) concentrations.

Methods: We conducted a cross sectional study in 100 healthy lactating women and their breast-fed infants (2-5 months) from a township in the Potchefstroom municipal area in South Africa. Hb concentrations were measured to assess the prevalence of anaemia. Anthropometric indices were determined and information on socio-economic status and infant feeding practices was collected via questionnaire.

Results: Using the WHO Hb cut-off to define anaemia (Hb<120 g/L, mothers; Hb<110 g/L, children 6–59 months), 19% of mothers and 38% of their infants were anaemic. Using previously suggested Hb cut-offs for infants, namely 97g/L, 100g/L and 105g/L, the anaemia prevalence was 8% ,11% and 26%, respectively. The majority of infants (67%) were exclusively, 9% predominantly and 24% partially breast-fed. The prevalence of underweight, normal weight, overweight and obesity in the mothers was 3%, 39%, 31% and 27%, respectively. Of the infants, 6% were overweight, 11% at risk for overweight, while only 3% were wasted. No associations were found between Hb concentrations of the infants, Hb of their mothers and other factors.

Conclusion: The high prevalence of anaemia in breast-fed infants and their mothers from the Potchefstroom area is of concern and potential causes need to be identified.

97. Iron and zinc bioaccessibility in African leafy vegetable (ALV) and maize meal composite dishes

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Background: African leafy vegetables (ALVs) may contribute towards increased vegetable intake, and improving food and nutrition security. ALVs contain several minerals, but information on bioaccessibility is limited.

Objective: This study investigated the effect of compositing with fortified and unfortified maize meal on bioaccessibility of iron and zinc in ALV dishes taking into consideration the mineral and anti-nutrient contents.

Methods: Four ALV dishes were prepared: Amaranth (100%)(A), Amaranth (80%) plus Spider Plant (20%, AS) or Pumpkin (20%, AP) or Cowpea (20%, AC). Tomato-and-onion mix, sunflower oil and commercial gravy were added. Total phenols, tannin, phytate, iron, zinc, magnesium, calcium and phosphorous contents as well as iron and zinc bioaccessibility were determined for each ALV dish (300 g) and ALVmaize meal composite dish (300g plus 125g).

Results: Both maize flours contained less minerals and antinutrients than the ALV dishes. Mineral bioaccessibility differed significantly between ALV dishes. Iron and zinc bioaccessibility from AS and AC was approximately 30-50% and 20-35% higher, respectively, than the other dishes. In general, % iron bioaccessibility, but not the amount of bioaccessible iron, increased when composited with fortified maize meal. Addition of unfortified maize meal reduced the amounts of bioaccessible iron and zinc in ALV dishes; addition of fortified maize meal had no effect.

Conclusion: Maize meal reduces the amounts of bioaccessible iron and zinc from ALV dishes; this can be prevented by using fortified maize meal. Despite variation in iron bioaccessibility from different ALV dishes and their composites, they have potential to contribute towards iron requirements.

98. Lean mass as a predictor of bone health in urban black South African women

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None

Introduction: Information on the relationship between body composition and bone health among African women is scarce. Previous studies had conflicting results about the effects of body mass index (BMI) on bone mineral density (BMD). There is an increasing concern about the loss of African women's inherent advantage of higher BMD than Caucasians.

Objective: To examine the association between body composition (BMI, fat mass and lean mass) and bone health (BMD and fracture risk) in urban black South African women.

Methods: BMD and body composition were measured in 234 black women using dual-energy X ray absorptiometry (DXA). Questionnaires were administered to examine the socio-demographic, lifestyle, dietary intake, physical activity and fracture risk. Activity energy expenditure (AEE) was measured using an accelerometer with combined heart rate monitor.

Results: Fat mass and lean mass were significantly associated with both femoral neck BMD and fracture risk when adjusted for potential confounders. However lean mass and not fat mass remained a significant predictor of femoral neck BMD (β = 0.531, p <0.001) and was negatively

associated with fracture risk (β = -0.208, p <0.001) when both variables were taken into account.

Conclusion: Lean mass and fat mass were significant positive predictors of femoral neck BMD and negatively associated with fracture risk in urban black South African women. Our findings suggest that compared to fat mass, lean mass might be a stronger predictor of bone health.

99. The impact of social grants on hunger in informal settlements in the Eastern Cape

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Nelson Mandela Metropolitan University

Introduction: Social grants are intended to target the most vulnerable households.

Objective: Data from an earlier cross-sectional study during April 2013, "Socio-economic determinants of HIV in informal settlements in the Eastern Cape" was analysed to describe money spent on food and prevalence of hunger in the context of social grants.

Methods: A proportional cluster sample (n=752) was selected among 18 to 49 year old residents of three urban informal settlements (Ethics approval NMMU: H13-RTI-HIV-002). Informed written consent was provided before trained, bilingual peer educators completed a closed-structured questionnaire. For the purpose of this bivariate analysis demographic-, socio-economic variables and hunger according to a simplified Household Hunger Scale, were included. The estimated amount of money spent on food per week per household and the household size were used to calculate the estimated amount spent on food per person per day.

Results: From the sample 63% (n=471) received grants; the majority (n=404) being child support grants. Significantly (Chi^2 = 12.46; p = .006) more respondents who received a grant reported higher estimated monthly incomes; however, significantly (Chi^2 = 29.82; p < .0005) more grant-holders compared to those not receiving grants reported spending less than R8.00 per person per day on food. Analysis of the Household Hunger Scale indicated that significantly more grant holders reported hunger than the non-grant holders.

Conclusion: Receiving social grants may not guarantee food availability in vulnerable communities. It is recommended that food rations or coupons should form part of restructured grants to reduce hunger.

Keywords: social grants, money spent on food

100. Psychotherapy for the treatment of obesity?

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Introduction: Obesity continues to increase globally. Many strategies and interventions have been used as treatment for obesity, but not much success has been achieved. The conservative treatment, nutrition education, fails to assist in reducing the global burden of obesity. Behavioral weight control and psychosocial interventions were explored and are still being explored for possible solutions in the fight against obesity. Articles and studies published between 2010 - 2013 have been selected for review. Material and **Methods:** PubMed Database has been searched for studies and peer reviewed articles on interventions and strategies for the treatment of obesity. Articles and studies that used strategies and interventions other than behavioral therapy and psychosocial interventions has been excluded. Terms that were searched: 'obesity', 'weight-loss', 'weight-gain', 'psychotherapy', 'lifestyle modification', 'intervention'

Results: The search identified a total of 17 articles on strategies and interventions used to treat obesity. 10 Articles were excluded in the review. Most research focused on psychosocial therapy and behavioral therapy to motivate weight loss in obese and overweight subjects. There are 5 different authors for the 7 articles of which one was responsible for 3 of the articles. Articles are all in English. Types of studies include a case study, randomized trials and reviewed articles.

Conclusion: Psychotherapy and behavioral therapy are significantly effective in the treatment of obesity. A new and different approach for sustained weight loss emphasize on psychosocial changes preceding the facilitation of improved eating.

Keywords: Obesity, Psychotherapy, Weight-loss, Weight-gain, Intervention, Lifestyle modification

101. Consumer perception of and purchase and usage behaviour towards red meat

Innike Taljaard, Hettie Schonfeldt, Beulah Pretorius
N/A

Introduction: The South African middle class consumer segment (LSM 5-8) is responsible for approximately half of national food expenditure. Meat accounts for about 26% of food expenditure and they contribute approximately 50% to total national meat expenditure. Since this market is the largest and fastest growing consumer segment it is important to understand purchase drivers and consumption behavior.

Objectives: The study aimed to understand and describe meat purchasing and consumption behavior and health perceptions.

Methods: The questionnaire was developed and tested (n=47) in 2011. A professional consumer panel recruitment agency was employed using experienced fieldworkers to conduct one-on-one interviews. A comprehensive questionnaire was completed during 2012 amongst a stratified sample (n=171; living in the Gauteng area). Data analysis involved sub-group comparisons (ANOVA and Chi-square analyses) and multivariate techniques.

Results: Purchasing considerations for beef, mutton/lamb and chicken meat focused mostly on safety, appearance, price and eating quality. Across meat types, dominant health perceptions included Nutritious, Good quality protein source, Healthy and Helps body grow. Chicken was perceived as significantly superior to red meat (p0.1).

Conclusions: When the SA middle class purchase meat, affordability, food safety and sensory appeal overshadows nutritional considerations as related to meat. Nutritionally, chicken was perceived as significantly more positive than beef and mutton/lamb, while mutton/lamb scored higher than beef regarding cholesterol-related considerations.

Keywords: South African middle class, meat expenditure, health perceptions

102. Scientific opinion on the substantiation of a health claim related to oat beta-glucan and lowering blood cholesterol and reduced risk of (coronary) heart disease

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DSM

The results from the SANHANES data made public in August 2013 typically display a cholesterol crisis. One out of four participants 15 years and older have an abnormally high serum total cholesterol (23.9%) and LDL cholesterol (28.8%), and one out of two an abnormally low HDL cholesterol level (47.9%).

The EFSA Panel on Dietetic Products, Nutrition and Allergies (NDA) was asked to deliver an opinion on the scientific substantiation of a health claim related to oat beta-glucan and lowering of blood LDL and total cholesterol. "Lowering blood LDL-cholesterol concentrations is a beneficial physiological effect by decreasing the risk of coronary heart disease." EFSA reviewed "22 references, which included three meta-analyses and 19 randomised controlled trials, as being pertinent to the health claim."According to EFSA "In weighing the evidence, the Panel took into account that most of the trials investigating the effects of oat beta-glucan at doses of at least 3 g/d have shown a statistically significant decrease in LDL-cholesterol concentrations, and that there was strong evidence supporting the biological plausibility of the effect." They concluded that "A cause and effect relationship has been established between the consumption of oat beta-glucan and lowering of blood LDL-cholesterol concentrations. "

Author: EFSA Panel on Dietetic Products, Nutrition and Allergies (NDA)

Reference: EFSA Panel on Dietetic Products, Nutrition and Allergies (NDA); Scientific Opinion on the substantiation of a health claim related to oat beta-glucan and lowering blood cholesterol and reduced risk of (coronary) heart disease pursuant to Article 14 of Regulation (EC) No 1924/2006. EFSA Journal 2010;8(12):1885. [15 pp.] doi:10.2903/j.efsa.2010.1885. Available online: www.efsa.europa.eu/efsajournal.htm

103. Systematic literature review assessing the link between nutrition, epigenetics and metabolic syndrome

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Introduction: Human studies and animal models provide evidence that maternal nutritional imbalance and metabolic disturbances during critical time windows of development may have a persistent effect on health of the offspring and may be transmitted to the next. New evidence shows that changes associated with chromatin remodeling & regulation of gene expression underlie the developmental programming of metabolic syndrome.

Materials and Methods: Using PubMed search engine, peer-reviewed studies on nutrition, epigenetics and metabolic syndrome were identified. The following terms were searched: "epigenetics", "nutrition and epigenetics", "maternal nutritional imbalance", "nutrition and gene regulation", "fetal programming" and "metabolic syndrome and epigenetics".

Results: Maternal malnutrition during gestation adversely influences the metabolism and health of the infant. Environmental cues during prenatal life can inappropriately program offspring and increase the prevalence of adult onset metabolic syndrome disease. Four mechanisms responsible for mediating epigenetic effects have been identified: 1. Chromatin modifications, 2. DNA methylation, 3. Histone modifications and 4. RNA-based mechanisms. It is also shown that these epigenetic effects may carry over to the next generation.

Conclusions: Articles concluded that malnutrition during pregnancy, particularly periconception remains a significant problem as it results in epigenetic changes. Changes are affected by multiple factors including gestational period, severity of malnutrition etc. These epigenetic changes add to the burden of the metabolic syndrome which exists worldwide. More research is needed on specific interventions to regulate epigenetics and prevent metabolic syndrome.

Keywords: Nutrition, Fetal programming, Epigenetics, Maternal malnutrition

104. Food insecurity among students at a South African university

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Background: In developed countries, food insecurity is emerging as a public health issue among university students. This study aimed to investigate food insecurity among students at an university in South Africa, a developing country with high levels of food insecurity in the general population.

Methods: In this cross-sectional survey, all students registered to the University of the Free State in 2013 were invited to complete a self-administered online questionnaire which included single-item and multi-item food security measures, and questions on socio-demographics, food procurement measures and coping strategies.

Results: 1416 respondents completed the questionnaire. Of these, 65% were identified as food insecure using the single-item measure; and 24.5% with low food security and 59.5% with very low food security using the more sensitive multi-item measure. Undergraduates, men, unmarried respondents, black and coloured respondents, and those relying on loans/bursaries, were more likely to be food-insecure than postgraduates, women, married respondents, white, Indian and Asian respondents, and those having their tuition paid by parents/guardians. Of the respondents 16% were employed, with 27.7% of these reporting that employment interfered with their studies. Also 21.6% reported that they support someone financially, mostly parents/children/siblings; 73.7% reported not always having enough money for food; 70.5% reported having borrowed food money, 53.3% reported having asked someone for food, 9.2% reported having sold their belongings for food money, and 1.6% admitted to having stolen food.

Conclusions: University students in developing countries may be a subgroup particularly vulnerable to severe food insecurity.

105. Nutrient content of South African C2 beef offal

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Agricultural Research Council

Introduction: Nutrient content and food composition tables of offal is relatively scarce however there is a great need for detailed information on food with adequate nutritive value, for the informal - poorer sections of the South African population.

Objective: To determine a selected group of nutrients in raw and cooked C-age, fat code 2 (C2), bovine offal and to evaluate it as a potential source of nutrients such as protein and iron.

Methods: The nutrient content of raw and cooked C2 bovine offal were analysed by accredited laboratories.

Results: Cooking affected nutrients such as moisture, protein, fat, ash and energy as well as the micronutrient values, which were higher in the cooked offal cuts. The biggest difference could be attributed to the difference in fat content between the cuts. The tongue is very high in fat with 23g/100g and therefore has the highest kJ (1157kJ) content of the six cuts. The spleen had the highest iron content (36mg/100g). Significantly lower fat contents were observed in the lungs (3g/100g), heart (7g/100g) and the spleen (3g/100g) cuts when compare to the values in the 1999 version of the South African Medical Research Councils Food Composition Tables. The heart, intestine and spleen are also an important source of Iron and compare favourable to beef. The heart also contained the highest zinc of all the cuts.

Conclusion: Offal containing primary food components which have high potential in human nutrition such as high protein content and can therefore is recommended as a good low cost nutritious product.

Keywords: Nutrient composition, South African offal, cooked, raw

106. Biodiversity perspective on nutrient contribution from various potato cultivars

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University of Pretoria

Introduction: Currently there is a global focus on biodiversity. Eliminating the loss of biodiversity was part of the seventh goal of the Millennium Development Goals which will as of 2015 be a further point of attention in the Post 2015 Development Agenda. Potatoes are a highly diverse crop with more than 3000 species over the world. All of these cultivars contribute to the biodiversity of the crop. The more sub-species found in a specific specie the stronger the biodiversity as well as the genetic diversity of the crop. With more than 80 different cultivars in South Africa, this staple crop can contribute to increased biodiversity, dietary diversity and food security of the country.

Objective: To determine the nutrient content of 11 cultivars most commonly consumed in South Africa.

Method: All the potato cultivars were planted, harvested and prepared in a similar manner. Nutrient analysis was done at the Agricultural Research Council (ARC-Irene) and the University of Pretorias NutriLab.

Results: The data shows that there is a significant difference in the nutritional content between the different potato cultivars. Significant differences were observed both in macro and micro nutrients with noticeable differences seen in phosphorus, 35.6-65.6mg/100g, as well as potassium, 370-537 mg/100g and protein 0.883-1.75mg/100g.

Conclusion: There is a significant difference in the nutritional content of potato tubers. Potatoes can thus contribute to the biodiversity of a diet. The data will form part of the FAO/INFOODS biodiversity database.

Keywords: Potatoes, nutrition, solanum tuberosum, biodiversity

107. Effect of nutrition education on eating behaviour and body composition of primary school children

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Van Niekerk Hugo Dietitians

Background: South Africa is affected by the increased obesity rate across all age, race and economic groups. School based programmes have shown success with obesity prevention and behaviour change.

Main **objective:** To determine if nutrition education is effective in improving eating behaviour and body composition of grade 2 and 3 primary school learners.

Methods: A randomised control trial was carried out among grade 2 and 3 learners at a primary school in Pretoria (Gauteng). Learners were randomly assigned to a control group (n=108) and intervention group (n=127). The eight month nutrition education intervention was based on the PATHWAYS curriculum and South African Food Based Dietary Guidelines. Body composition and eating behaviour (by means of the Knowledge Attitude Behaviour Questionnaire) were obtained at baseline and end of the study. Comparisons between groups were analysed with student t-tests and multivariate analyses.

Results: Anthropometric indices did not change significantly between the two groups: Body weight p=0.96, Height p=0.54, Waist p=0.23, MUAC p=0.22 TSF p=0.14, CSF p=0.29, Body fat% p=0.16, BMI p=0.56. Nutrition knowledge ($p<0.0001$) and eating behaviour ($p<0.0001$) improved significantly more in the intervention group compared to the control group. Attitude towards healthy eating did not differ significantly between the groups, p=0.2.

Conclusion: This nutrition education programme showed improvement in nutrition knowledge and eating behaviour among learners which may play a role in the prevention of overweight and should be investigated further.

108. Low intake of calcium and vitamin D associated with stunting in an impoverished Northern Cape community

Lize van Stuijvenberg, Jana Nel, Serina Schoeman, Lisanne M du Plessis, Muhammad A Dhansay
Medical Research Council

Childhood stunting has immediate and long-term consequences for health and development. This study aimed to identify the nutritional factors associated with the high levels of stunting in 2-5-year-old children from an impoverished Northern Cape community where liver is frequently eaten and vitamin A deficiency known to be absent. Dietary intake was assessed by a single 24-hour recall. Heights were measured, and information was obtained on breastfeeding history, habitual milk intake, birth weight, and substance use during pregnancy (n=150). The prevalence of stunting was 36.9%. Birth weight correlated with height-for-age z-scores (HAZ; r=0.25, P=0.003), and was lower in children where mothers smoked and used alcohol during pregnancy than where mothers abstained ($P<0.0001$). Median intake of energy, carbohydrate and protein was adequate. Median intake for all micronutrients was at least 90% of the EAR, except for calcium, vitamin D and vitamin E, which was 21%, 15%, and 32%, respectively. Median intake of iron, zinc, niacin, vitamin B6 and vitamin B12 exceeded 200% of the EAR. Intake of fat, calcium, phosphorous, vitamin D, riboflavin and vitamin B12 was significantly lower in stunted than in non-stunted children ($P<0.05$). When excluding children with low birth weight (LBW), intake of calcium, vitamin

D and riboflavin were significantly lower (P<0.05). HAZ were significantly higher in children who habitually drank milk compared to those who did not (P=0.003). Inadequate calcium and vitamin D intake, presumably due to low intake of milk after weaning, seems to have contributed to the stunting in this population, even after accounting for LBW.

109. Early introduction of practical research in undergraduate Dietetics Modules: Preliminary results on the teaching-research nexus

Esmarie van Tonder, Liana Steenkamp, Annelie Gresse
Nelson Mandela Metropolitan University

Introduction: Evidence shows increased student engagement and deeper understanding through inquiry-led learning. However, most undergraduate students place a low importance on research compared to other academic activities.

Objective: The objectives are to develop, implement and assess a teaching-research nexus model to improve interplay between research and teaching at the NMMU: Division of Dietetics.

Methods: Module development is done to progress from research-orientated discussions in the first year to research-led, research-tutored discussions and research-based activities from the second and third year. It is envisaged that this early introduction will improve the quality of research-based activities during the fourth year. The theoretical model will be underpinned with detailed examples on how the interplay is currently implemented. Student feedback in the form of mid and end of semester evaluation forms are used to assess perceptions and the value of the teaching-research nexus. A visual presentation with detail will be illustrated on the poster.

Results: As this is the second year that the programme is offered, the researchers present preliminary results. Student feedback data indicate that the research application is perceived as interesting (median score: 3.8/5) with some aspects such as critical appraisal seen as valuable for other learning activities as well.

Conclusion: Early introduction of undergraduate dietetics students to research are perceived positively and can be successfully integrated into modules from as early as the first year. The teaching-research linkages and potential benefits will be investigated on a continuous basis over the next 5 to 10 years to examine and describe undergraduate students perspectives on academic research and teaching quality.

Keywords: research skills, training, early integration

110. The non-pharmacological adjuvant treatment of osteoarthritis by alkalinization of the diet

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Osteoarthritis (OA) is influenced by both genetic and environmental risk factors. Anti-inflammatory medication for OA is associated with serious side effects. The aim of our study was to test the hypothesis that an alkaline diet relieves the symptoms and clinical signs of OA.

We conducted a single centre, double blind, placebo-controlled, cross-over study of the efficacy and safety of Multiforce ® Alkaline Powder in participants with OA.

One hundred (100) volunteers, between 18 and 80 years of age with symptoms and signs of OA were recruited. They were randomly assigned into two groups: (n=50 Group A [Verum], n=50 Group B [Placebo]) Patients were instructed to take the trial medication for a period of 28 days, after this period they switched immediately to the alternative treatment for another period of 28 days. Patients were clinically and biochemically evaluated every 14 days during the 56 trial period for symptoms and signs of OA. The intake of this supplement rich in alkaline minerals was associated with a significant increase in the urinary pH. A significant reduction in general pain (p<0.005), as well as tenderness, pain and stiffness in the inter-phalangeal joints of the hands (p<0.005) was recorded during the treatment with the verum as compared to the placebo.

Conclusion: A dietary supplement containing potassium-, magnesium- and calcium-citrate (Multiforce ® Alkaline Powder) relieved the symptoms and signs of OA, and may be a safe and effective adjuvant in the management of OA.

111. Food Security Status and Academic Performance of Students on Financial Aid at the University of KwaZulu-Natal

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University KwaZulu-Natal

Universities are required to improve access and success for students from economically disadvantaged backgrounds. Tertiary education is costly and inadequate student financial support undermines academic interventions by contributing to high drop-out and low graduation rates. The extent of food insecurity (FI) under the local student community is high. It is unknown to what extent FI affects academic performance. A cross-sectional descriptive survey was conducted on a random sample of students (n=269) on financial aid. Anthropometric dimensions, food security status, coping mechanisms, monthly food expenditure, dietary diversity, academic performance and nutritional knowledge were measured using standardised methods and questionnaires. The mean Body Mass Index (BMI) of students (21.8 ± 8.7 kg/m^2) fell within the normal range of the healthy population. The mean monthly food expenditure was R566.40 (± 204.29). A 53.1% of the students reported to be moderately FI. The FI students had a BMI of almost 2 kg/m^2 units higher compared to that of the food secure students. No relationship between academic performance and level of food security was measured, even though it was evident that students in this study under-performed with a Combined Performance Index (CPI) of less than 90, whereas below 120 is considered to be below average. A national investigation into the financial aid received by underprivileged students is urgently required as it is evident from this study that almost all students on financial aid, whether they report to be food secure or insecure, under-perform academically. Nutrition intervention should target all students on financial aid.

112. Food consumption patterns in South Africa

Hester Vermeulen, Hettie Schonfeldt
BFAP

Introduction: South Africa is a socio-economic and demographically complex nation, characterised by upward socio-economic mobility. A clear understanding of households' food consumption habits from a macro-economic perspective is critical to understand and guide food policy and programs.

Objectives: To investigate the dynamics in household-level food consumption patterns of socio-economic sub-groups in South Africa, based on food expenditure data from a macro-economic perspective.

Methods: Household-level expenditure data from the National Food Consumption Surveys of Statistics South Africa (2005 and 2010; n>20 000) are viewed as nationally representative data sources. The two datasets were analysed to obtain average expenditure levels on a wide range of foods for the ten population income deciles and three socio-economic sub-groups. Further analyses explored trends in the data over time and within segments.

Results: From 2005 to 2010 food expenditure increased by more than average food inflation for the poorer and middle income segments – suggesting increased food consumption levels. Expenditure on staple foods and meat dominate baskets. Dietary diversity clearly increased towards wealthier segments. Dominant staple foods and meat types are interrogated and discussed. Real expenditure (above inflation) on pasta, maize meal, pork and beef increased significantly for all socio-economic sub-groups and shifts in choice linked to income were found.

Conclusions: The food consumption patterns of South African consumers show some dynamics over time and are strongly linked to income levels, with dietary diversity and complexity changing significantly with increased income.

Keywords: South Africa, food, consumer, expenditure, consumption patterns

113. Investigating fresh red meat labelling information in South Africa

Hester Vermeulen, Hettie C Schonfeldt
BFAP

Introduction: Packaging information is an important tangible resource used by consumers to gauge product quality. The new South African food labelling regulations (R146 of 2010) implied significant changes in terms of permitted labelling information.

Objectives: To conduct an in-store observational survey of fresh red meat (beef and lamb) labelling information in South Africa to enable comparison with the perceptions and decision factors of middle- and high income consumers.

Methods: Fresh red meat labelling observations were conducted among independent butchers and large retails across South Africa (n=50). Observations were compared with consumers' perceptions of red meat based on comprehensive consumer surveys among stratified representative samples of SA middle and high income consumers (n=171 & n=249) in 2012/2013.

Results: Labelling information at independent butchers focused mainly on price, store name and packaging date. Other observations included quality guaranteed/assured, brand, sell-by date and fat-content claims. Selected brands offered by large retailers indicated more advanced labelling information.

Consumers' red meat purchase considerations focused largely on safety, appearance, affordability and eating quality. Fat content was more prominant than 'nutritional value'. Health-related issues were prevalent in consumers' concerns regarding red meat.

Conclusions: In general the basic nature of red meat labeling information presented to South African consumers is in line with consumers' dominant purchase considerations. However, the prominence of red meat health concerns implies a need for more extensive nutritional information on fresh red meat labels to facilitate informed consumer decision-making.

Keywords: Beef, mutton, lamb, labeling information, consumer, perceptions, R146

114. Children aged 2 to 5 years in Western Kenya consume a varied diet

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Introduction: Nutrition of children under the age of 5 years in developing countries remains a serious concern.

Objective: To describe children's (2-5 years) food intake and the relative contributions of food groups to total energy intake.

Method: A cross-sectional food consumption survey of a purposively selected sample of 102 mothers/caregivers of children (2-5 years) from seven rural communities in Nyanza Province, Western Kenya was conducted. An interviewer administered Quantitative Food Frequency Questionnaire was used for collecting data. Foods were grouped into food groups. Data were analysed using FoodFinder 3 dietary analysis program. Median (g) food intakes and energy (%) contributions of the food groups were calculated.

Results: Altogether 32 food items and 12 food groups were reportedly consumed by > 20% of the sample. The most food items consumed were from the vegetables (13), fruits (11) and cereals (9) food groups. The fish group (35g/day median) contributed the most energy (16.1%). Food groups contributing more than 10% energy each were the cereals (43g; 14.6%), roots and tubers (86g; 14.5%), dairy (100g; 13.6%) and fruits (175g; 10.1%) food groups. A large number (99%) of the children consumed more than the recommended four different food groups per day, though in quantities smaller than the recommended amount per serving.

Conclusions: Despite an apparently varied food intake, consuming foods in amounts less than those recommended limits nutrient intake.

Keywords: food groups, diet, children, energy intake

115. Exploration of the food practices of young black adults in Tshwane and their food environments

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Introduction: Major changes in food systems and food environments occurred globally over the past decades, driven by migration, urbanisation, modernisation and globalisation. These have resulted in economic, social and lifestyle changes. Food has become readily available and accessible in multiple settings throughout the day. Collectively these environments influence what, where and how much is eaten. **Objectives:** A mixed methodological approach was followed to assess and interpret the contribution of social structural and food culture changes on the food practices of the study group by using the theoretical model of food culture change.

Methods: This cross-sectional study used a pre-tested survey questionnaire to determine the food practices of 515 respondents. Additional information

from an observation checklist on the food environments, focus group discussions and secondary data were obtained to determine and describe the food environments, to analyse and interpret the foods available, accessible and acceptable to the young adults. Descriptive statistics and content analysis were used to analyse and interpret the data.

Results: Western-oriented food practices were adopted, and the majority (69%) consumed three meals a day with in-between meal snacking. Frequent inclusion of high fat and sugar snack foods, opposed to a daily consumption of dairy products, fruit and vegetables by less than 26% of the respondents raises concern.

Conclusion: The influence of the modern urban lifestyle was evident in the available, accessible and acceptable foods to the group. This, together with the continuous social structural and food culture changes poses major challenges to adopt healthy food practices

116. Breast milk intake and weight history of a female infant: a case study

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University of Pretoria

Introduction: Breastfeeding mothers often wonder whether their babies get enough milk. We investigated the breast milk intake and weight history of a full-term (birth weight 2.85kg), healthy, female infant, exclusively on-demand breastfed.

Methods: From life-day 6 to 31 a total of 100 test-weighings (before and after feeding weights) were performed using a SECA 374 baby scale (precision 5g) and timed. Until age 48 months, body weight and length (SECA infantometer) / height (Leicester height measure) were regularly obtained using standard techniques. Growth was interpreted with the World Health Organization (WHO) growth charts as standards (growth velocity: weight gain per day; weight, height and body mass index for age: z-score curves over time).

Results: Mean breast milk intake per feed was 91.4±29.7 mL. In a 24-hour period the baby was typically (mode) nursed seven times. Mean feeding time was 15.3±5.7 minutes. The mean interval between feeds was 3.4±1.2 hours, with a gradually increasing trend, especially over midnight. Mean total weight gain per day during the test-weighing period was 142±107.6g. For each of the growth indices the child followed an own "healthy" curve - parallel to the WHO standards - , staying between z-score -1 and 0.

Conclusion and recommendation: Breast milk intake quantities vary considerably between feeds and days. Weight gain and finding an individual baby's personal growth curve is a long-term function of nutritional adequacy, health and genetics. Infant feeding recommendations must be done cautiously and be tailored to individual circumstances.

117. Dairy for optimal nutrition of all South Africans: current evidence, challenges and opportunities

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The latest food based dietary guidelines (FBDG) for South Africa have a new guideline "Have milk, maas or yoghurt every day". Based on the scientific support that was published for this FBDG (Vorster et al. SA J Clin Nutr 2013;26(3)suppl:S57-S65), the aim of this presentation is to review more recent evidence related to dairy consumption and health, and to investigate the challenges facing South Africans in the implementation thereof. Topical systematic reviews and meta-analyses critically explore the association between dairy intakes (including specific types and components thereof) and non-communicable diseases (NCD), including obesity, diabetes mellitus, cardiovascular disease and certain cancers. The link between dairy intake in childhood and physical stature also receives considerable attention. The local surge in NCD, the high prevalence of stunting and the fact that dairy may be able to close critical nutrient intake gaps of South Africans, thus warrant in-depth investigation into promotion of dairy consumption. Financial constraints are, however, a reality facing many citizens. For South Africans to realize that "milk matters" and offers nutritional value for money, barriers to consumption must be overcome, by not only explaining the role of dairy in disease prevention and its nutrient contributions, but by also addressing salient misconceptions and taking health economics into account. Theory-based, practical interventions are needed, targeting stakeholders and consumers at all levels and aiming at behaviour change. This will require innovative thinking matched to the needs of the various target groups.

118. Body mass index and self-classified weight of first year B.Dietetic students (University of Pretoria)

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Introduction: It has been suggested that general body weight dissatisfaction may be higher among students studying dietetics than in students studying non-food and nutrition related degrees.

Objectives: To explore the association between body mass index (BMI) and self-classified weight of first year dietetic students.

Methods: A cross sectional study was carried out among a convenience sample of first year female dietetics students (n=53) enrolled at the University of Pretoria in 2012 and 2013. Self-classified weight was obtained from a validated Multidimensional Body-Self Relations Questionnaire (MBSRQ) and the Stunkard Figure Rating Scale (FRS). Body mass index (BMI) was calculated from measured weight and height.

Results: Mean BMI was 21.6 ± 3.1 kg/m^2, with 13% being underweight (BMI<18.5 kg/m^2) and 15% overweight or obese (BMI≥25 kg/m^2). Seven (13%) and three (6%) students indicated being of normal weight on the FRS and MBSRQ respectively, but were in fact underweight. On the other hand, thirteen students (25%) reported to be "somewhat overweight" on the MBSRQ compared to only one student on the FRS, but were of normal weight (BMI: 18.5 - 24.9 kg/m^2). The correlations between BMI and self-classified weight were 0.686 and 0.706 for the FRS and MBSRQ respectively.

Conclusion: The majority of the students had a normal BMI although distorted perceptions about their BMI were prevalent among some of the students, which differed depending on the use of visual figure scales or questionnaire based questions. Self-classified weight measured by both the FRS and the MBSRQ showed a strong correlation with BMI.

119. Anthropometric status and Body Image Perception of undergraduate students at UWC

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Introduction: Overweight and Obesity contribute considerably to the emerging epidemic of Chronic Diseases of Lifestyle in South Africa. The relationship between actual weight and body image perception (BI) may have implications for public health interventions aimed at addressing these conditions.

Methods: A randomly selected sample of male (n=143) and female (n=131) undergraduate students participated in the Department of Dietetics Campus Health Survey in 2011. Weight and height were measured by trained and standardized fieldworkers to classify participants by Body Mass Index (BMI) category. Participants self-selected their current and ideal Body Image (BI) from gender-specific 9-figure body image scales. As a proxy measure of body dissatisfaction, a body discrepancy score (BD) the difference between current and ideal BI- was determined. SPSS v 21 was used for statistical analysis.

Results: 48% of females (n=131) were of normal weight while 26.7% and 22.1% were overweight and obese, respectively. For males (n=143) the BMI distribution was 69.2% normal weight, 16.1% overweight and 12.6% obese. More females (80.9%) than males (62.2%) had a current BI which equated with their actual BMI. By BD category, 100% of overweight/ obese females and 73.2% of male counterparts favoured a smaller BI. Overall, 86% of participants selected ideal body images depicting BMI within the range of 19-25.

Conclusion: The overall prevalence of 38% overweight and obesity amongst students is cause for concern. Our findings imply that campus-based health promotion strategies aimed at weight management are both necessary and likely to be met with favor by the student body.

120. Food handling practices and nutrition knowledge of household caregivers in northern KwaZulu-Natal

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Introduction: Food borne illnesses are a common occurrence especially at household level but they go unnoticed because of improper food handling practices and a lack of nutrition knowledge. According to Lum (2010) foodborne illnesses are dangerous because an estimated number of 5,000 people die and 325,000 are hospitalized because of food poisoning. In 2008 the Hygiene Council reported that 76 million foodborne-related illnesses occur every year. In the world, South Africa included there is under reporting of foodborne illness outbreaks (NDoH, 2011; Smith *et al.,* 2007). Peltzer (2004) showed that blacks had lower general nutrition knowledge levels when compared to whites.

Objectives: To investigate food handling practices of household caregivers and to determine the nutrition knowledge levels of household caregivers in Northern KwaZulu-Natal.

Methods: A quantitative research approach was used to collect data in 15 rural villages of Umhlathuze Municipality under jurisdiction of Chief Mkhwanazi. A survey sampling method was followed using questionnaires as data collecting instruments in 147 households, which were conveniently willing to be a part of the project.

Results: Majority of households had proper food handling practices. Seventy four percent of respondents had good nutrition knowledge levels.

Conclusion and recommendations: Households caregivers practice proper food handling practices and their nutrition knowledge levels were good. Food preparation environment and hygienic practices; food hygiene practices; personal hygiene and availability of food preparation equipment were not satisfactory.

Keywords: Food handling practices, food borne illnesses, nutrition knowledge

121. Biologically based approaches for reduction of fumonisinmycotoxin exposure in rural South Africa

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The fumonisinmycotoxins, produced by *Fusarium* species in maize, are important environmental and carcinogenic agents, occurring in many parts of the world. Approximately 60% of Africa's grain supplies are at risk, thereby contributing to food insecurity in Africa. High risk population groups include rural subsistence farming communities reliant on maize as their staple diet. The highest levels of fumonisin B_1 (FB_1)in contaminated maize intended for human consumption occur in the Eastern Cape Province of South Africa, where exposure to FB_1 in adults is more than four times over the provisional maximum tolerable daily intake set by the Joint FAO/WHO Expert Committee on Food Additives. Although commercial maize is contaminated with lower levels, daily exposure thereof could be a risk factor for disease development in impoverished communities. Despite international regulations, these mycotoxins are not regulated in South Africa.

Biologically based methods are increasingly being explored for reducing *Fusarium* diseases and mycotoxin levels in crops. Pre-harvest approaches include breeding for resistant maize cultivars; introduction of biocontrol microorganisms and phenolic plant extracts;and expression of fumonisin degrading enzymes in transgenic maize cultivars. Recently developed post-harvest approaches include the removal of fumonisins from food by natural clay adsorbents, while there is an increased interest in enzymatic degradation of fumonisins through decarboxylation and deamination by recombinant bacterial and fungal enzymes. This paper will discuss biologically based control methods with emphasis on the development of food-grade recombinant carboxylesterase and aminotransferase enzymes as well as cultural specific intervention strategies for introduction in rural communities at risk.