

Results: Mean \pm SD age and BMI was 20.5 ± 4.5 years and 22.3 ± 3.1 kg/m² respectively. The majority of participants were female (79%) of Australian nationality (85%) and 55% ($n = 686$) reported consuming supplements. There was no significant difference in age, BMI and nationality between supplement users and non-users, however women were more likely to use supplements ($p < 0.001$) than men. The most popular supplements were multivitamins (28%), vitamin C (28%), multivitamins with iron or other minerals (27%) and iron (20%). The majority of supplement users reported daily consumption (48%).

Conclusions: Micronutrient supplement use is prevalent in University students. Understanding the reasons why individuals consume supplements is an important next step to identify strategies to reduce consumption of these often unnecessary additional vitamins and minerals in the diet.

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DIETARY PHOSPHORUS AND PHYTASE AND PERFORMANCE OF BROILER CHICKENS FROM DAY 22 TO 49 POSTHATCH

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Background/Aims: The available phosphorus (AP) requirement of broilers (22–49 days post-hatch) fed a sorghum based diet with or without phytase supplementation were investigated.

Methods: Male broiler chicks (21 days old) were weighed and randomly allocated into 40 pens with 10 birds per pen. The experimental diets contained graded levels of AP (2.0 to 5.0 g/kg) in the increments of 1.0 g/kg. The calcium level was 9.0 g/kg diets. All the diets were prepared with or without phytase (Phyzyme XP, 10000 FTU/kg diet) supplementation. Each diet was fed to five replicate pens. Body weight and feed intake were recorded weekly and feed conversion ratio (FCR) calculated.

Results: Body weight, feed intake and FCR of birds on diets containing AP of 2.0 g/kg without supplemental phytase at day 49 were significantly impaired ($p < 0.05$) compared to other treatments. Phytase supplementation improved performance of bird fed on diets containing AP of 2.0 g/kg and had no benefit for birds fed diets containing AP of 3.0 g/kg or higher.

Conclusions: Dietary AP of 3.0 g/kg or 2.0 g/kg with supplemental phytase met phosphorus requirement of broilers from 22 to 49 days of age.

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DIETARY PHOSPHORUS AND PHYTASE AND PERFORMANCE OF BROILER CHICKENS FROM DAY 1 TO 21 POSTHATCH

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Background/Aims: Most publications of available phosphorus (AP) requirements in broilers are derived from corn-soybean meal diets. This study was to investigate AP requirement of broilers fed on sorghum based diets with or without phytase (Phyzyme XP).

Methods: Day-old Ross male broiler chicks were randomly allocated into pens with 10 birds/pen. Each of the diets was fed to five replicate pens. The experimental diets contained AP from 2.5 to 5.5 g/kg for starter (days 1–14) and 2.0 to 5.0 g/kg for grower (days 15–21) in the increments of 1.0 g/kg. The calcium level was 10.0 g/kg for starter and 9.0 for grower, respectively.

Results: Body weight, feed intake, tibia bone and toe ash contents of birds on diets containing AP of 2.5 or 2.0 g/kg without phytase were significantly lower ($p < 0.05$) than all other treatments. However, with phytase the growth these measurements of the birds were similar to those on diets with higher AP levels. Phytase supplementation to diets containing 3.5 or 3.0 g/kg AP or higher gave no further improvements in growth performance

Conclusions: The results suggested that AP of 2.5 or 2.0 g/kg with supplemental phytase and 3.5 or 3.0 g/kg without supplemental phytase met phosphorus requirement of broilers from days 1 to 21.

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EQUINE VITAMIN K ABSORPTION

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Background/Aims: Vitamin K is involved in many physiological processes beyond blood coagulation. There are a number of forms of vitamin K: phyloquinone (K₁), menaquinones (K₂) and menadione (K₃) that is synthetic and added to animal diets. The objective of this study was to determine the absorption efficiency of different isoforms of vitamin K.

Methods: Twelve mature geldings were allocated to six groups in a random crossover design. There were six treatments; control, K₁, K₂ (in the form of menatetrenone, MK-4), K₃ and KQ (Quinacranone™, a soluble form of K₁ and K₂ in the ratio of 10:1). These were administered as a 200 mg oral bolus. Blood sampling was undertaken for 480min. In the last treatment K₁ (200 mg) was administered intravenously and blood sampled for two hours. Plasma was analysed for K₁, MK-4 and K₃.

Results: The highest plasma K₁ concentrations occurring with KQ ($p = 0.0001$). Both KQ and K₁ showed no conversion to K₃ or MK-4 in plasma. K₃ was well absorbed, but there was no detectable conversion to MK-4. Bioavailability was calculated for oral treatments relative to intravenous K₁ (100%); 0.45% for KQ, 0.14% for K₁.

Conclusions: The soluble form of the vitamin, KQ was the most efficiently absorbed. There is no specific conversion of K₁ to K₃ or K₃ to MK-4 in plasma in the horse, contrary to what occurs in some other mammals.

Funding source(s): N/A.

HIGH CALCIUM AND IRON DEFICIENCIES IN AN ELDERLY RURAL SOUTH INDIAN POPULATION

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Background/Aims: Severe deficiency in calcium and iron can lead to osteoporosis and anaemia, especially in the elderly. We aimed to assess the nutritional status of rural dwelling elderly south Indians.

Methods: In 24 villages in the Rishi Valley, South India, we collected demographic, anthropometric, and dietary information on consenting adults in a case-control study of hypertension. Dietary intake was obtained using a culturally appropriate, 24 hour dietary recall questionnaire. Energy and nutrient intake were calculated using a purpose-built South Indian food database.

Results: Data were available for 222 adults: 57% men, median age 60 years (interquartile range, IQR 50–70). Approximately 26% had a BMI less than 18 kg/m². More women (96%) than men (84%) were deficient in calcium ($p = 0.007$). Median calcium intake was 420 mg/day (IQR 317–530) in men and 315 mg/day (IQR 242–407) in women; less than the Indian RDI of 600 mg/day. Approximately 98% of the sample had anaemia. Median iron intake for men (14.8 mg/day, IQR 11–18) and women (12 mg/day, IQR 10–15) were also below the Indian RDI of 17 mg/day for men and 21 mg/day for women.

Conclusions: Intake of calcium and iron is at a critically low level in this rural South Indian elderly community. Community based nutritional interventions are needed to improve intake of calcium and iron rich foods, especially in elderly women.

Funding source(s): NHMRC.

IODISED SALT HAS YET TO REACH THE RURAL POOR OF INDIA

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Background/Aims: Approximately 71% of households in India are consuming adequately iodised salt, leaving ~30% of the population at risk of iodine deficiency disorders (IDD). The aim of this study was to assess the levels of iodine in salt consumed in households from a disadvantaged rural area of South India.

Methods: Samples of salt were obtained from 27 households, selected by convenience sampling, in the Rishi Valley, Andhra Pradesh. Iodine content was determined using iodometric titration (sensitivity: 1 ppm; CV%: 2 to 3%).

Results: Approximately 86% of households were consuming non-iodised or inadequately iodised salt. Twenty three (82.1%) of the salt samples collected comprised salt in a crystalline form. The other samples comprised crushed salt. Less than 14.3% of salt samples had iodine content greater than 30 ppm and all of these were from crystallized salt, while 43% of salt samples had iodine levels below 15 ppm, and 43% of samples contained no detectable iodine.

Conclusions: The majority of households surveyed were not using iodised salt, thereby providing evidence that many people in this rural population are not receiving adequately iodised salt. This may be explained by the greater cost of iodised salt. Collaborative efforts between the public and private sectors in India will help increase the availability of adequately iodised salt in disadvantaged populations.

Funding source(s): NHMRC.

Poster session 6: magical mystery tour of nutrition part 2

VALIDATION OF A 24 H RECALL QUESTIONNAIRE CULTURALLY MODIFIED FOR USE IN RURAL SOUTH INDIAN POPULATIONS

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Background/Aims: The assessment of dietary intake in rural populations can be challenging because of cultural and environmental barriers. We aimed to validate a 24-hour (24h) recall questionnaire, culturally modified for use with South Indian populations, against weighed food records (WFRs).

Methods: Dietary data collected by 24h recall and WFR were compared in 45 adults aged 19–85 years who were sampled by convenience. WFRs were conducted in the household by one of the investigators and a trained field worker who weighed both the food consumed by each participant and any waste left over. The following day, field workers administered a 24h recall interview to the same participant. Bland Altman plots were used to assess the agreement between the two methods. Pearson correlations were used to assess the relationship between energy and nutrient intake calculated from each method. Least products regression was conducted to assess fixed and proportional bias.

Results: Robust associations were demonstrated between the two methods for energy ($r = 0.64, p < 0.001$), protein ($r = 0.66, p < 0.001$) and iron ($r = 0.68, p < 0.001$). No fixed or proportional bias was detected for fat, fibre, or calcium intake. There was reasonable agreement between the two methods with < 9% of values lying outside the 1 SD limits for energy and nutrient intake.

Conclusions: Our culturally modified 24h recall provides a valid measure for the assessment of the intake of energy and nutrients in rural Indian populations.

Funding source(s): NHMRC.

BONE MINERAL DENSITY (BMD) IN RATS IN A MODEL OF METABOLIC SYNDROME (METS)

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Background/Aims: Studies assessing association between MetS and bone status have yielded inconsistent results; subjects with MetS had lower bone mineral density (BMD) but also lower fracture risk. We investigated BMD in an animal model of MetS and the effects of feeding a variety of different nutraceuticals.

Methods: Male Wistar rats were fed on either a corn starch (CS) or high-carbohydrate, high-fat (HCHF) diet that produces physiological characteristics of MetS for 8 weeks followed by a further 8 weeks during which half of each group of rats received a dietary supplement of a nutraceutical (including cardamom, chia, inulin, lignan, linseed oil, caffeine, seaweeds; $n = 8-15$ per group, $n = 194$ control diet). BMD of rats was determined at 16 weeks using dual energy x-ray absorptiometry (Norland XR36). Difference between groups was tested using two-way ANOVA; factors, diet and nutraceutical.

Results: Rats fed the HCHF diet were significantly heavier than those fed on the CS diet (474.5 ± 4.3 vs. 401.7 ± 4.3 g, $p < 0.0001$ respectively) but control HCHF rats had significantly lower ($p < 0.0001$) %BMD than CS-fed rats (0.035 ± 0.0002 vs. 0.041 ± 0.0002 respectively). Caffeine ($p < 0.001$), lignan ($p = 0.005$) and seaweeds ($p < 0.001$) significantly decreased BMD while feeding lignan ($p = 0.005$) and linseed oil ($p = 0.038$) increased BMD relative to controls. Inulin ($p < 0.001$) and chokeberry ($p = 0.0015$) significantly increased %BMD.

Conclusions: An HCHF (MetS) diet increased overall BMD due to a larger body mass but decreased BMD relative to body weight; partly offset by supplementation with chia seeds, chokeberry or inulin.

Funding source(s): N/A

DIVERSITY OF VIEWS, STRATEGIES AND TACTICS WITHIN AUSTRALIA'S FOOD AND NUTRITION POLICY LANDSCAPE: A PILOT STUDY

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Background/Aims: Good public health policy is critical to effectively addressing rising levels of obesity and non-communicable diseases. However, the contested policy landscape surrounding the nutritional risks of sugar, sodium and saturated fat reflects the diversity and strongly felt views among key players in nutrition policy development. The aim of this pilot study is to investigate the dichotomy and diversity of views in Australia's nutrition policy landscape, which may compromise good public health policy outcomes.

Methods: Six key players active in nutrition policy development were recruited from each interest group being examined: the government, food industry and public health sector. Each participant partook in a semi-structured interview. Responses were compared with a media analysis of press releases published in the last 3 years from the same organisations interviewed. Core themes and concepts were identified through a text analysis using Leximancer software.

Results: The Leximancer analysis indicates that key interest groups frame nutritional risks in markedly different ways. The food industry primarily drew on a frame of individual behaviour while the public health sector drew on structural and whole-of-population frames. Aspects of both the industry and public health frames were evident within the government responses.

Conclusions: The findings demonstrate the contested landscape surrounding nutritional risks, depicted by competing frames. A larger study is required to explore these findings, investigate the policy influencing activities undertaken to influence policy, and overall, how optimal, integrated nutrition policy solutions can be developed into the future.

Funding source(s): ARC and Australian Food and Grocery Council

ASSESSING HYDRATION STATUS DURING ULTRA-ENDURANCE EVENTS: ARE CERTAIN ASSESSMENT TECHNIQUES PROMOTING FLUID-OVERLOAD?

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Background/Aims: Novel data on hydration assessment techniques used during a 230 km multi-stage ultra-marathon (MSUM) conducted in hot conditions (32–40 °C) and a 24-hours continuous (122–208 km) ultra-