NSA 2020 ASM Poster Abstracts

Maternal diets matter for children’s dietary quality: Seasonal dietary diversity and animal-source foods consumption in rural Timor-Leste

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Improving the dietary quality of women and children is essential to reduce all forms of malnutrition. In Timor-Leste, the majority of the population are semi-subsistence farmers and undernourishment is widespread. Our aim was to examine the dietary quality of children 6–59 months old and their mothers living in rural Timor-Leste. We assessed child and maternal dietary diversity and animal-source foods (ASF) intake, using 1,236 observations from combined data from 167 mother-child dyads. We used generalized linear and logistic mixed-effects models to examine their dietary differentials in two livelihood zones and across the seasons, as well as to identify household and agro-ecological characteristics associated with children’s diets. We found dietary quality to be marginally better in coastal than in mid-altitude zones. Women’s diets were strikingly poor and their intake of ASF was lower than among children. Mothers exhibited preferential allocation patterns of specific ASF to children. Seasonality predicted the intake of ASF. Maternal dietary quality and educational attainment, more so than agro-ecological characteristics, were explanatory factors of children’s diet. Our study highlights that addressing the dietary quality of children in Timor-Leste would benefit from improving women’s diets through better access to nutritious foods and to secondary education.

Dairy consumption and menopausal symptoms: A cross-sectional study among Iranian postmenopausal women

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Dietary approaches as part of lifestyle factors are of paramount importance in management of symptoms. Dairy foods are rich sources key nutrients for maintaining the good bone health in elderly particularly women after menopause. Milk consumption has been linked to elevated plasma
oestradiol concentrations in postmenopausal women suggesting the implication of dairy foods in menopause-related symptoms. This study aimed to investigate the association between dairy food consumption and menopausal symptoms in Iranian postmenopausal women (n= 393). A food frequency questionnaire was applied to assess dietary intake, menopausal symptoms were assessed using a menopause rating scale (MRS) questionnaire. After adjustment for age, years since menopause, education level, body mass index (BMI), physical activity, energy intake, healthy eating index and fibre intake; higher total dairy intake was related to lower somatic (β= -0.184; P-value <0.001), psychological (β= -0.155; P-value 0.002) and total MRS (β= -0.184; P-value <0.001) scores. In term fat content, higher intake of low-fat dairy was associated with lower somatic (β= -0.175; P-value <0.001), psychological (β= -0.181; P-value <0.001) and total MRS (β= -0.189; P-value <0.001) scores. Our findings demonstrated that regular consumption of low-fat dairy could be advised for managing the somatic and psychological complaint of menopause.

Food and nutrition education in primary schools: A qualitative study of Australian parents' views

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Selenium and iodine supplementation protects first trimester human placenta against oxidative stress

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Background Maternal nutrition is critical for fetal growth and development. The placenta is the key mediator of maternal nutrition to the fetus. Micronutrients such as selenium, iodine and copper are involved in neutralizing oxidative stress. Aim To determine how selenium, iodine and copper impact oxidative stress in the placenta. Methods Human placental explants were supplemented with selenium, iodide, their combination, or copper for 72 hours. The concentrations chosen reflected deficient, physiologically normal and supra-physiological levels. Placental explants were then treated with menadione or antimycin for 24 hours to induce oxidative stress. Placental explants were harvested, fixed, processed and embedded in paraffin blocks. Results Laser Ablation Inductively Coupled Plasma Mass Spectrometry validated that placenta uptakes selenium and copper. Selenium and iodide reduced DNA damage and apoptosis (p < 0.05). Following oxidative stress induction, a higher concentration of selenium was needed to reduce oxidative damages (p < 0.05). A high concentration of copper increased apoptosis and DNA damage (p < 0.05) but this effect was not significant in oxidative stress. Conclusion Excess level of copper impact the placenta, adversely.
Selenium and iodine, alone or in combination, protect placenta from oxidative stress. Optimal level of micronutrients are essential for placenta health and survival.

**Longitudinal weight gain and lifestyle factors in women with and without polycystic ovary syndrome**

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**Background:** While women with polycystic ovary syndrome (PCOS) have a higher risk of weight gain than women without PCOS, the independent association of lifestyle factors with weight change is not known.

**Methods:** We used data from the 1973-78 cohort of the Australian Longitudinal Study on Women’s Health for longitudinal analysis of data collected over 19 years. Linear mixed-effects models were used to examine weight change and its association with lifestyle factors, adjusted for sociodemographic, psychological factors and health care utilisation.

**Results:** Women with PCOS gained more weight annually (0.27 kg/year, 95% CI 0.14, 0.40) than women without PCOS. While women with PCOS had higher weight gain than those without PCOS both for the groups with better and worse lifestyles, the magnitude of this difference was greater for women with PCOS who had higher energy intake, glycaemic index and longer sitting time and those not meeting PA guidelines.

**Conclusions:** Women with PCOS and with higher energy intake, increased glycaemic index, longer sitting time and insufficient PA had the greatest weight gain. This indicates lifestyle factors have a more profound impact on weight gain in women with PCOS than without PCOS.

**Diet screening tool identifies both nutritional risk and psychological status in Australian middle-aged adults**

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Publish consent withheld

**Energy and macronutrient intake in the elderly predicted by sour taste gene (KCNJ2)**
Background: KCNJ2 gene polymorphisms have been linked to sour taste and preference. While variations in other taste receptor genes have been shown to influence dietary intakes, the influence of sour genotypes on diet is not clear. Therefore, relationships between KCNJ2 polymorphisms, energy and macronutrient intake were investigated. Methods: FoodWorks™ software was used to analyse food frequency questionnaire data from an elderly population (≥65 years; n=531). Logistic regression analyses were used to compare mean intakes by carriage of the KCNJ2- rs236514 variant allele (A), with adjustments for age and sex. Results: Presence of the A allele was associated with lower intakes of energy (9048 vs 8161 kj/day; p=0.007), carbohydrate (236 vs 216 g/day; p=0.04), protein (99 vs 91 g/day; p=0.007) and fats (77 vs 68 g/day; p=0.01), however, there were no differences in alcohol consumption by allele carriage (p>0.05). Results were maintained for total energy, protein and fat intake when analyses were adjusted for age and sex. Percentage energy contribution did not differ by allele carriage for macronutrients or alcohol (p>0.05). Conclusion: The influence of the KCNJ2 polymorphism on energy and macronutrient intake established that sour taste may relate to dietary intakes or appetite in the elderly, with possible implications on health.

Betaine (tri-methyl-glycine) supplementation during summer lactation did not affect subsequent oestrus-to-ovulation interval of sows that exhibited a normal weaning-to-oestrus interval

Sows lactating during hot conditions may have a prolonged oestrus-to-ovulation interval (OOI) which can complicate the insemination timing for subsequent breeding. Betaine supplementation in lactating sows under hot conditions may facilitate follicle development and normalise OOI, therefore we investigated the effect of betaine supplementation on subsequent OOI in sows lactating during summer. Lactating multiparous sows were supplemented with (n=183) and without (n=195) 0.16% betaine (tri-methyl-glycine) during summer (December 2019-March 2020; 25.4 ± 5.01°C (mean±s.d.)). Wean-to-oestrus interval was similar between treatments (av. 4.3 days). The OOI was quantified in a subset of sows (n=46 for betaine and n=54 for control) selected from those showing behavioural oestrus on the 4th and 5th day post-weaning (representing 88% of total sows). Ovaries were scanned using trans-rectal ultrasound every 24 hours from the 2nd day post-behavioural oestrus until pre-ovulatory follicles (diameter≥5.0 mm) disappeared. Ovulation was assumed to have occurred 12 hours before the pre-ovulatory follicles were no longer seen on the ovaries. Results showed betaine supplementation did not affect OOI (1.2±0.09 vs 1.3±0.08 days (mean±s.e.) for control vs betaine group, P=0.59) in multiparous sows that exhibited normal weaning-to-oestrus intervals after summer lactation. Insemination at onset of oestrus remains the best timing for such an OOI.

Associations between two diet quality scores and obesity in a nationally representative sample of Iranian households: a cross-sectional study

Associations between two diet quality scores and obesity in a nationally representative sample of Iranian households: a cross-sectional study
Research examining associations between diet quality and obesity in Iranian adults is limited by small and non-representative samples. This study investigated the cross-sectional associations between two diet quality indices and obesity in a nationally-representative sample of Iranian adults and whether these associations were modified by sex or area of residence. Data on 18,307 adults (mean age 37.0 (SD 15.2) years) were used from the Iranian National Survey 2001-2003. Two diet quality indices (Healthy Eating Index, HEI, and Diet Quality Index International, DQI-I) were calculated from three household 24-hour dietary recalls. Multi-level regression analyses were used to evaluate associations between household HEI and DQI-I and individual Body Mass Index (BMI). Effect modification by sex and area of residence (urban vs rural) were examined. Higher HEI and DQI-I were associated with higher BMI (β HEI: 0.07, 95% CI: 0.06, 0.09; β DQI-I: 0.03, 95% CI: 0.02, 0.04). The positive associations between HEI and DQI-I and BMI were stronger in females and in rural areas. While these findings suggest that higher diet quality is associated with higher BMI in Iranian adults, longitudinal health and individual dietary intake data are needed to determine whether these unexpected associations persist over time.

Design and development of a Mediterranean diet intervention for individuals with irritable bowel syndrome and comorbid anxiety or depressive symptoms

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Dietary modification is a first line therapy for management of irritable bowel syndrome (IBS). However, dietary intervention for individuals with IBS and comorbid mental health disorder has not been evaluated. There is evidence that the Mediterranean diet (MD) can reduce depressive symptoms; it also confers broad health benefits and positively impacts the microbiome. We aimed to design an MD intervention for individuals with IBS and concurrent anxiety or depression for use in a future randomised controlled trial (RCT).

Large-scale MD RCTs were reviewed to guide food group targets and lifestyle traditions. Factors relevant to disease context were taken into account; e.g. FODMAP composition was considered for participant acceptability and to enhance internal validity of the trial. A 2-week meal plan was devised and analysed for macro-, micro-nutrient and FODMAP content.

The diet preserved the traditional MD components and adhered to food group targets. Macronutrient content aligned with published MD interventions and micronutrients broadly met NRVs. Participant resources were created to assist with dietary implementation and adherence.
An MD intervention for individuals with IBS was successfully developed. The menu plan and resources produced will support individualised dietetic advice for participants. Feasibility, acceptability and clinical effectiveness will inform its future clinical use.

Formative evaluation of a novel plant-based dietary approach for people with chronic kidney disease: Perspectives of Australian renal dietitians

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This study aimed to explore the perceptions of Australian renal dietitians regarding plant-based diets for people with chronic kidney disease (CKD), as well as obtain their critical evaluation of a novel plant-based dietary prescription and accompanying educational resources for use in a future clinical trial and practice. Initial concept-testing using a short online survey informed the development of a series of supplementary education resources. Critical evaluation was then conducted using semi-structured interviews. Thematic content analysis was undertaken using an inductive approach. Forty-seven renal dietitians participated in this research. For successful implementation, dietitians would need to challenge existing organisational norms and overcome barriers such as lack of time, limited capacity to follow up patients, differing nutritional priorities and fragmented dietary advice. The focus on food-based strategies and emphasis on overall healthy eating behaviours, together with recipes and flexibility in food choices within the design were identified as strengths. Several improvements and considerations were also discussed. The dietary prescription and accompanying educational resources could be useful additions to dietetic practice. However, future investigations are still required to examine the perspectives of the target population and assess the practicality, safety and efficacy of this dietary approach before translating such strategies into practice.

A systematic review of the short-term and long-term effects of dietary patterns on cardiometabolic health in older adults

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Ageing increases the risk of cardiometabolic disease development. Diet has been shown to have protective and causal effects on cardiometabolic health. The aim was to consolidate the current evidence on the short-term and long-term effects of dietary patterns on cardiometabolic health in adults aged 65 years and over. Ten databases and two trial registries were searched, identifying a total of 40,042 records. Quality assessment was conducted and the certainty of evidence was assessed. Thirteen articles were included and twelve dietary patterns were evaluated. The low-fat dietary pattern showed reduced risk for adiposity, however, no effects were shown for hypertension incidence, composite coronary heart disease incidence (including myocardial infarction, coronary heart disease and coronary revascularisation), high-density lipoprotein cholesterol and also increased blood pressure in the long-term. The Mediterranean dietary pattern showed reduced triglycerides and systolic blood pressure, and showed no effects on diastolic blood pressure, high-density lipoprotein cholesterol and glucose in the short-term. The Mediterranean dietary pattern showed the most benefits without harm on cardiometabolic health in older adults. The current body of evidence is small, with further research warranted to help identify the most effective dietary pattern for cardiometabolic health benefits in older adults to inform future guidelines.
Molecular Mechanisms Towards Increasing the Nutritional Functionality of White Salted Noodles

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White salted noodles are popular wheat-based food around the globe. Compared to pasta, noodles have a higher glycaemic response. The present work aims to increase the nutritional functionality of noodles by a) manipulating the starch crystallinity; b) varying the protein content, and c) optimising cooking and storage conditions. The digestive enzyme susceptibility of noodles was found to be associated with both degrees of gelatinisation of starch (limiting catalytic action of α-amylase) as well as the gluten network encapsulating the starch granules (restricting the access of α-amylase). In terms of cooking, enzyme resistant starch (ERS), as well as the estimated glycaemic index (eGI) of microwaved and stir-fried noodles, were significantly higher (>20%) compared to conventionally cooked noodles through boiling and steaming. On the other hand, the ERS of cooked noodles stored at 25°C was significantly higher than noodles stored at 4°C. Supramolecular organisation (helical structure and crystallinity) had a more pronounced effect than the macroscopic structure such as compactness or bulk density in terms of nutritional functionality of noodles. The present study provided the molecular mechanisms as well as the formulation, cooking and storage conditions to decrease the eGI and increase the ERS of noodles important to both consumers and manufacturers.

Sensory, antioxidant and physicochemical influences on the likeability of a selection of commercially available Australian honeys

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Honey’s composition and appearance are largely influenced by floral and geographic origins. Australian honey is frequently sourced from supermarkets, however, properties associated with consumer preference are relatively unknown. A sensory and in-vitro analysis was completed on a selection of commercially available Australian honeys. Samples (n=32) were analysed for visual, olfactory and taste characteristics, with overall likeability assessed by the trained sensory panel (n=24; M=12). In-vitro analysis included colour intensity (mAU); phenolic content; antioxidant characteristics (DPPH, CUPRAC); and physicochemical properties (pH, viscosity, Total Soluble Solids). When compared to the most liked honey sample, 23 samples were liked significantly less (P<0.05). Likeability of honey was positively associated (P=0.005) with perceived sweetness and it was negatively associated (All P’s<0.05) with crystallisation; odour intensity; waxy, chemical, and fermented smell; mouthfeel; aftertaste; sourness; bitterness and pH. Price ($/100g) was not associated with likeability (P=0.143), indicating price value potentially does not influence consumer preference. Conclusively, significant differences between the likeability of honey samples demonstrates that not all sampled honeys are of the same quality to consumers. Additionally, the
number of negative associations with likeability indicate consumer honey selection could occur due to the disapproval of properties, leading to their purchase rejections.

**Performance of estimative dietary equations quantifying net endogenous acid production and the potential renal acid load**

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While dietary estimates of net endogenous acid production (NEAP) and potential renal acid load (PRAL) continue to be investigated for associations with health outcomes, a limited number of studies have assessed the accuracy and precision of their methods of measurement. We investigated the performance of methods quantifying the diet dependent acid-base load. Seventeen healthy participants (mean ± SD age, 60 ± 8 years; BMI, 23 ± 2 kg/m²) were fed both acid and base forming diets, prepared by a research kitchen, for 6 days each and concurrently collected 24-hr urine samples for analysis. This enabled calculation of NEAP and PRAL via reference urinary analysis, as well as estimative diet equations (by Frassetto et al., Remer and Manz, Sebastian et al. and Lemann et al.). Bland-Altman analysis showed accurate diet equations included PRAL by Sebastian et al. (Bias: -4 mEq/d, 95% CI: -8 to 0) as well as NEAP by Lemann et al. (Bias: 4 mEq/d, 95% CI: -1 to 9) and Remer and Manz (Bias: -1 mEq/d, 95% CI: -6 to 3). All dietary estimates were imprecise. Researchers are encouraged to collect biochemical measures of NEAP and PRAL.

**Prevalence and amount of alcohol consumption in 18 to 30-year-olds in New South Wales.**

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The National Health and Medical Research Council advises youngest adults, those aged ≤ 25 years, are most likely to experience harm after excessive alcohol consumption. This study determined alcohol intake among 18 to 30-year-olds across New South Wales. Dietary data for 1,001 young adults was collected by a three-day prospective record using a purpose-designed and validated app. Median alcohol intakes (g) per consumer were calculated and comparisons made by age group and gender using Mann Whitney U test. Mean difference in energy intake was investigated using a General Linear Model, adjusted for age, gender, consumer status and effect modification. The proportion of youngest adults (< 25 years-old) consuming alcohol was less than among 25 to 30-year-olds (23.5% versus 38.5% P<0.001). For consumers the median daily intake was 11.2 g (IQR 5.3-18.5) for 18 to 24-year-olds, and 14.1 g for 25 to 30-year-olds (IQR 7.3-25.5) P=0.041. Males consumed more alcohol than females, 14.7 g (IQR 7.3-26.2) and 12.3 g (IQR 5.5-20.2) respectively, P=0.017. Mean (adjusted) energy intake of consumers was 9163 kJ compared to 7698 kJ for non-consumers (P<0.001). Contrary to public opinion drinking was less prevalent among youngest adults with median intake equivalent to approximately one standard drink only.

**Significant and rapid weight gain after heart transplantation**
Heart transplant recipients are known to suffer considerable weight gain after transplantation, increasing their risks of cardiovascular events and graft rejection, but Australian evidence is scarce. This study aimed to assess weight changes in heart transplant recipients in the two years post-transplantation. Heart transplant recipients at Queensland’s cardiothoracic transplant hospital were eligible if aged ≥18 years, were transplanted 1990–2017 and were alive ≥2 years post-transplantation. We extracted measured weights at time of transplant (baseline), at routine follow-up at 1 year and 2 years post-transplantation; measured height; and demographic information from hospital records. We assessed changes in body mass index (BMI) from baseline to 2 years post-transplantation using repeated ANOVA and McNemar test. Of 316 heart transplant recipients, 127 (40%) (median age 52 years; male 81%) had all weight measurements available. At baseline, mean BMI was 26.3 kg/m² ± standard error 1.02; 79 (62%) were overweight/obese. At 1 year, mean BMI increased to 27.7 kg/m² ± 1.02 (p<0.001) and 91 (72%) were overweight/obese (p=0.019). At 2 years, mean BMI further increased to 28.2 kg/m² ± 1.02 (from baseline p<0.001) and 98 (77%) were overweight/obese (p<0.001). Our findings show significant weight increases occur in the 2 years post-heart transplant, especially during the first 1 year.

**Nutrition information in pregnancy: Where do women seek advice and has this changed over time?**

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Nutrition during pregnancy is fundamental to both the health of the mother and her baby. The present study aimed to: (1) identify where women source their nutrition information during pregnancy; and (2) assess the accuracy of nutrition information for pregnancy available online. A survey instrument that identified the main sources of nutrition information was administered to 68 pregnant women recruited online. Data were compared to similar surveys conducted in 2008, 2011 and 2014. A content analysis of websites was simultaneously conducted to assess accuracy of available information. The main source of nutrition information for a variety of topics was verbal communication from health professionals (% affirmative responses; 6.6% to 69% across survey years). There was an increasing trend in internet sourced information for most nutrition, with it being the main source of information for listeria/food safety (15.3%-32.4%) and healthy eating (25%-42%). Of the n = 165 websites identified by content analysis, 82.4% (n = 136) were rated as accurate, with government (96.9%) and business (100%) sites having the highest accuracy. Verbal communication from health professionals remains the most important source of nutrition information for pregnancy but the high credibility of websites identifies this as another important resource.
Is the Mediterranean dietary pattern integrated in routine Australian dietetic practice for management of chronic conditions? A national survey of dietitians

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Evidence supports recommending the Mediterranean dietary pattern (MDP) in the management of cardiovascular disease (CVD), type 2 diabetes (T2D) and non-alcoholic fatty liver disease (NAFLD). However, the evidence-practice gap is unclear within non-Mediterranean countries. We investigated integration of MDP in Australian dietetic practice, and barriers and enablers to MDP implementation for chronic disease management. Australian dietitians treating patients with CVD, T2D and/or NAFLD (n=178, mean age 37±11 years, 97% female) completed an 87-item online survey in November 2019. Fewer than 50% of participants counsel patients with CVD (48%), T2D (26%) and NAFLD (31%) on MDP in majority of their practice. MDP principles always recommended by >50% of participants were promoting vegetables and fruit and limiting processed foods and sugary drinks. Principles recommended sometimes, rarely or never by >50% of participants included limiting red meat and including tomatoes, onion/garlic and liberal extra virgin olive oil. Barriers to counselling on MDP included consultation time and competing priorities. Access to evidence, professional development and education resources were identified enablers. An evidence-practice gap in Australian dietetic practice exists with <50% of participants routinely counselling relevant patient groups on MDP. Strategies to support dietitians to counsel complex patients on MDP within limited consultations are needed.

Cacti as a potential functional food candidate and a protective agent against chronic disease - a review of literature

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The health benefits of consuming natural foods and functional food products are a primary topic of interest in human nutrition. Cacti are an unconventional and affordable plant, commonly used to improve the structure and consistency of food products, whose potential health benefits are starting to be investigated. The plant has the capacity to retain large quantities of water, and is fleshy and pulpy, with the ability to grow and develop in barren areas. Cacti and its constituents possess a high antioxidant concentration, are rich in phytonutrients and can provide food product preservation and health benefits through several technological and biological pathways. Cacti are versatile, being utilised for human food, included in animal feed and medicinal applications, for wastewater treatment, and agricultural development and rehabilitation. Cacti have the potential to exhibit protective effects against chronic metabolic conditions, such as obesity, cardiovascular disease, diabetes mellitus, and cancer. However, there is currently an absence of rigorous evidence to recommend its use as a complementary therapy to minimise the incidence or management of non-communicable diseases. Nevertheless, the current literature demonstrates strong potential for functional food product development and beneficial health effects that warrant further investigation.

Keywords: cacti; non-communicable diseases; phytonutrients; functional food

Development and validation of a vitamin D screening tool for detecting hypovitaminosis D in Australian adults

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Vitamin D deficiency is thought to affect up to half the world’s population. Calcitriol is the bioactive form of vitamin D, with its precursors obtained through food and ultraviolet-B (UVB) light exposure. Current hypovitaminosis D diagnosis relies on biomarker testing. The aim of this study was to develop a novel screening tool to detect vitamin D deficiency in Australian adults. A systematic literature review informed the tool development by identifying trends in vitamin D screening, finding that current tools are largely not validated. Screening tool development needs to consider the country of use to capture local food, environmental and cultural practices. Four key elements were included in the instrument: (1) a food frequency questionnaire using new Australian food data; (2) a UVB exposure survey (3) identification of skin type; and (4) vitamin D supplement use. An expert panel confirmed face and content validity testing prior to validation against serum 25(OH)D concentration, personal dosimeters and skin spectrometry in a clinical study with pre- and post-menopausal women. The novel tool was found to be valid for use in research.

Self-management strategies, physical activity and dietary intake in women with polycystic ovary syndrome: a cross-sectional study

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The 2018 Polycystic Ovary Syndrome (PCOS) Evidence-Based Clinical Guidelines recommend lifestyle intervention (physical activity (PA), nutrition and behavioural interventions) as first-line treatment for PCOS management. Use of self-management strategies helps women better implement these recommendations and reduce the risk of PCOS-associated disease. This paper describes the association between PA and nutrition-related self-management strategies and body weight, body mass index (BMI), PA and dietary intake in women with PCOS. Women (n=501) in Australian aged 18-45 years with self-reported PCOS completed a 24-hour dietary recall and the International Physical Activity Questionnaire (IPAQ) online. Nutrition self-management strategies had no association with diet quality [OR: -0.02 (95%CI: -3.21, 2.63), p=0.843], energy intake [OR: -0.05 (95%CI: -842.91, 546.08) p=0.671], BMI [OR: -0.13 (95%CI: -3.76, 0.95), p=0.236] nor weight [OR: 0.04 (95%CI: -0.72, 3.19), p=0.211] nor weight [OR: 0.04 (95%CI: -7.11, 4.66), p=0.679]. PA self-management strategies increased the odds of meeting PA recommendations [Odds ratio (OR): 3.88 (95%CI: 2.87, 5.25), p<0.001] but had no association with BMI [OR: 0.14 (95%CI: -0.72, 3.19), p=0.211] nor weight [OR: 0.06 (95%CI: -3.49, 6.28), p=0.571]. Use of PA but not nutrition self-management strategies was associated with implementing PCOS lifestyle recommendations. Other behaviour determinants (e.g. self-efficacy) should also be considered when wanting to implement PCOS lifestyle recommendations in the long-term.

**Is a Higher Protein-Lower Glycemic Index Diet More Nutritious than a Conventional Diet? A PREVIEW Sub-Study.**

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High protein diets and low glycemic index (GI) diets have been associated with improved diet quality. This post hoc analysis of the PREVIEW study included 161 Australian participants with overweight and pre-diabetes assigned to either a higher protein-lower GI diet (HPLG: 25% energy from protein, dietary GI < 50, n = 85) or a moderate protein-moderate GI diet (MPMG: 15% energy from protein, dietary GI > 56, n = 76). Food records were collected at 0-, 6-, 12-, 24- and 36-mo. Linear mixed models were used to compare the changes from 0-mo of total energy, macro- and micronutrients, dietary GI and glycemic load between the two diets. The HPLG group showed significantly higher protein intake and lower dietary GI and GL than the MPMG group (group fixed effect P < 0.001 for all three parameters). The reported dietary intakes of zinc (group fixed effect P = 0.05), selenium (P = 0.01), niacin (P = 0.01), vitamin B12 (P = 0.01) and cholesterol (group-by-time fixed effect P = 0.001) were higher in the HPLG group than in the MPMG group. We found that a HPLG diet was more nutritious in relation to some micronutrients, but not cholesterol, than a MPMG diet.

**Palmitic and Lauric acid differently modulated skeletal muscle mitochondrial dynamics, membrane potential and metabolic inflammation in human primary myotubes.**

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The chain-length of saturated fatty acids (SFA) may dictate their impact on inflammation and mitochondrial dysfunction, two pivotal players in the pathogenesis of insulin resistance. Thus, the aim of this study was to compare the effect of palmitic (PA) and lauric (LA) acid on skeletal muscle mitochondrial health and metabolic inflammation.

Human primary myotubes were challenged with either PA or LA (500µM). After 24 hours, the expression of interleukin-6 (IL-6) was assessed by qPCR, while Western blot was used to quantify the inhibitor of nuclear factor kappa-B (IĸBα) and mitofusin-2 (MFN-2). Mitochondrial membrane potential and dynamics were evaluated using tetraethylbenzimidazolylcarbocyanine iodide (JC-1) and immunocytochemistry, respectively.

PA, but not LA, triggered an inflammatory response marked by an upregulation of IL-6 mRNA (p<0.01) and a decrease in IĸBα (p<0.05). Furthermore, while PA and LA did not differently modulate the levels of mitochondrial electron transport chain complex proteins, PA induced mitochondrial fragmentation (p<0.001), decreased MFN-2 (p<0.05) and caused a drop in mitochondrial membrane potential compared to control (p<0.01), with these effects being absent in LA-treated cells.

Thus, LA, contrarily to PA, did not trigger pathogenetic mechanisms linked with insulin resistance and therefore represents a potentially healthier SFA to preserve skeletal muscle metabolic health.

Diet quality is associated with ultra-processed food consumption in Australian adults: findings from a nationally representative cross-sectional study

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Diets high in ultra-processed foods (UPFs) have the least healthful nutrient profile, however there is no evidence investigating associations between UPF consumption and overall diet quality in Australia. This study examined whether diet quality varied by consumption of UPFs in a cross-sectional nationally representative survey of Australian adults. Dietary data from the Australian Health Survey 2011-13 (n=8,209 aged≥19years; mean age 49.5 years (SD 17.1)) were used. UPFs were identified using the NOVA classification system. Diet quality was assessed using the Dietary Guideline Index (total and subcomponents). Linear regression analyses, adjusted for demographics and lifestyle characteristics, were used to examine associations between dietary share of UPF (% of total energy intake) and diet quality. The dietary energy share of UPFs was inversely associated with diet quality (Coef: -0.5, 95% CI: -0.5 to -0.4). Higher dietary energy share of UPF was associated with lower diet quality subcomponent scores for food variety and fruit and vegetable intake, and higher scores for discretionary food and extra sugars intake. This research adds to the global body of evidence on how UPF consumption is detrimental to overall diet quality and can be used to inform the development of policies and guidelines to improve diets for Australians.

Trends in package size of discretionary foods
Understanding changes to discretionary food package sizes provides insight to consumption trends associated with obesity. The aim of this study was to determine the trends in food package sizes of carbonates and confectionery over the last 15 years. A scoping review was performed using the Joanna Briggs Institute framework. Package sizes of carbonates and confectionery were investigated for Australia, the USA, Canada and the UK, between the years of 2005-2019 with unit sales data extracted from the Passport Euromonitor database. Per-capita carbonate sales data showed increased purchases of smaller package sizes (<300mL) and decreased purchases of larger package sizes (≥2000mL) in all four countries over time. In contrast, confectionery package size sales data showed no consistent trends across countries. In Australia, sales of single-serve confectionery (<25g and 25-49g) packs decreased and sales of larger package sizes (50-99g, and >100 g) increased. The most popular package size also varied by countries, with >100g being most popular in Australia, 25-49g in USA and UK, and 50-99g in Canada. In conclusion, changes in package sizes have been identified for some energy-dense, nutrient-poor foods in high income countries in the past 15 years, with a trend towards smaller package sizes for carbonates.

The effectiveness of digital delivered interventions on nutrition behaviours and nutrition-related health outcomes for underserved people with type 2 diabetes: Systematic review

A systematic review was conducted to assess the effectiveness of digital delivered interventions for improving nutrition behaviours and nutrition-related health outcomes including clinical parameters and obesity indices, among underserved people with type 2 diabetes (T2D). Seven databases were searched for studies published between 1990 and 2019. Nine out of 1588 identified records were included, comprising 373 participants. Three digital platforms, including websites, short message services and smartphone applications, were used to deliver dietary recommendations. Significant improvements in dietary behaviours were reported in four out of 9 studies, representing improvements in eating habits, healthier food choices, or increases in dietary knowledge and skills. Two studies found significant mean reductions for HbA1c ranging from –0.43% to –0.84%. One study reported -0.7 reduction in BMI and one reported significant decreases in weight (1.2 kg) and waist circumference (2.23 cm), compared to the control group. These limited studies show digital delivered interventions have a small beneficial effect on improving nutritional outcomes. However, they were heterogeneous in scope and utilized different modes of intervention delivery which leads to findings that are difficult to integrate and interpret. Therefore, there is a need for further research into how underserved people with T2D may benefit from digital approaches.

The Central Australian Expedition (21 August 1844-15 January 1846) Captain Charles Sturt quest for the inland sea

During his tortuous inland journey from Adelaide, Charles Sturt with 15 men was frequently delayed by drought and serious water shortage. They were trapped at Depot Glen (north-west New South
Wales) in the height of summer for six months. Sturt then established a forward depot camp at Fort Grey and stubbornly made three exploratory journeys northwards to Lake Torrens, the Coopers Creek area and beyond over the next six months. The dietary adequacy and food security over time for the party on the six stages of the journey was investigated. Diaries kept by Captain Sturt and two of his companions (Dr Harris Browne, Daniel Brock) were examined by systematic thematic analysis. An objective qualitative method was developed to assess available food group diversity and food variety scores over time (days). These scores were used as a proxy for dietary adequacy and food security throughout the journey, which deteriorated. An interested observer of indigenous people, Sturt took aboriginal guides whenever possible. The main wild foods the party ate were fish and birds when they were available, and other foods gifted by the aboriginal people. The men suffered grievously from scurvy, James Poole losing his life.

**Defining whole grain foods – do estimations of intake affect associations between whole grains and anthropometric measures: An Australian and Swedish perspective**

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Historically, there are inconsistencies in the calculation of whole grain intake, particularly through use of varied whole grain food definitions. The current study aimed to investigate impacts of using a whole grain food definition on identifiable associations with anthropometric measures in Australian and Swedish cohorts. Data from the Australian National Nutrition and Physical Activity Survey 2011-12, the Swedish Riksmaten adults 2010-11, and relevant food composition databases was utilised. Whole grain intakes were calculated as grams of whole grain from any food (absolute intake) or based on foods complying with the Healthgrain definition (≥30% whole grain (dry weight), more whole than refined grain and meeting accepted standards for ‘healthy foods’). In Australian adults, whole grain intake was associated with all anthropometric measures when applying a definition, but not with body weight when including grams of absolute intake. No associations with quartiles of whole grain intake were found for Swedish adults. BMI, waist circumference and waist-to-height ratio were associated with absolute grams of whole grain intake, but not when applying a definition. Use of whole grain food definitions impact our findings on whole grain benefits. Consistency, currently absent from global research, is critical to establish clear evidence of whole grain benefits.

**What adolescents see on Instagram: content analysis of #intermittentfasting, #keto, #lowcarb**

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Adolescents report engaging in dieting attempts to manage weight. Diet-related information may be sourced from social media given its frequent use. This study aimed to describe popular diet content visible on adolescent social media accounts.

An adolescent Instagram profile captured 250 ‘top’ images from three popular diet hashtags (#intermittentfasting #keto #lowcarb). Images were coded using a pre-determined ontology as food
At the time of data collection, there were 3.8M #intermittentfasting, 19M #keto, and 22M #lowcarb posts on Instagram. Images tagged #intermittentfasting were categorised as 44% food, 40% people, 14% information; #keto were 55.6% food, 33.6% people, 9.2% information; and #lowcarb were 64.8% food, 16.4% people, 18.4% information. Of the 750 images, 79.3% of food images were core foods, depicting animal protein (n=219), vegetables (n=195), and dairy (n=111). Desserts represented almost 1 in 5 #lowcarb images (n=47). Images of people were individual (51.1%) or before/after (41.3%); mostly female (77.4%), of white (55.3%) ethnicity. Across all posts, 12.5% were linked to a commercial product/program, and 2.3% provided nutrition information.

This study found diet-related images visible to adolescents on Instagram promote animal-based foods with/without vegetables. Few provide useful nutrition information.

**Efficacy of Functional Foods, Beverages, and Supplements Claiming to Alleviate Air Travel Symptoms: Systematic Review with Meta-Analysis.**

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Airline passengers experience a range of symptoms when travelling on long flights. This review evaluated the efficacy of functional foods, beverages and supplements claiming to address the effects of air travel for healthy adults. Products were identified in a scoping review of electronic databases, search engines and grey literature during March to August 2019. A systematic review of the efficacy of product ingredients using five electronic databases from inception to 2019 was conducted. Articles were screened, data extracted, and risk of bias assessed independently by two researchers. Meta-analysis was performed using a random effects model. Of the 3421 studies identified, 23 met selection criteria: melatonin (n=10), pycnogenol (n=4), various macronutrients (n=2), caffeine (n=2), centella asiatica (n=1), elderberry (n=1), echinacea (n=1), fluid (n=1) and pinokinase (n=1). Meta-analysis showed favourable impacts of melatonin on jetlag in eastbound (n=5) and westbound (n=4) flights: standard mean difference -1.68 (95% CI -3.09 to -0.28, I² 90%, P=0.02) and -1.51 (95% CI -3.34 to 0.33, I² 95%, P=0.11) respectively. Pycnogenol for oedema (n=3) was also favourable, with standard mean difference -4.25 (95% CI -6.46 to -2.04, I² = 98%, P=0.0002). Overall, only 12 out of 183 ingredients contained in 199 products had evidence to support claims.

**Perceptions of children and parents on the use of video games for nutrition education – a focus group study**

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With nearly one-third of New Zealand children being overweight and obese, and the majority deemed not to be meeting national physical activity guidelines, it is with urgency that we address childhood obesity in New Zealand. Changing dietary behaviours has proven difficult. Serious games are increasingly being used in behaviour interventions due to the rapid growth and accessibility of digital technology. Hence, we aim to explore the perceptions of New Zealand parents and children on video games for nutrition education. A qualitative research design using focus group interviews...
was used to gather the perceptions of parents and children on video games for nutrition. Ten adults and 62 children from three primary schools in Dunedin took part in the study. A total of ten focus groups for children and one for adults were carried out over one school-term. Preliminary analysis were undertaken following the completion of each focus group, and the 10th focus group was determined to be the point of saturation. NVivo software will be used for data analysis. Content analysis will be carried out, and meaningful sections of text will be systematically and sequentially coded and categorised following a general inductive approach, allowing key “themes” to emerge from the data.

Quantification of 25-hydroxyvitamin D during pregnancy using liquid chromatography tandem mass spectrophotometry: comparison of serum vs. plasma samples

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The aims of this study were to assess the agreement of total 25-hydroxyvitamin D (25(OH)D) concentration, and its three analytes, in plasma and serum samples collected during pregnancy, and to examine the proportion of women who change vitamin D category based on sample type. Plasma and serum samples were collected from n=114 non-fasting women between 12-25 weeks gestation in Newcastle, Australia. Samples were analysed by liquid chromatography-tandem mass-spectrometry (LC-MS/MS) to quantify total 25(OH)D and its analytes and examined using Bland-Altman plots, Pearson correlation (r), intraclass correlation coefficient and Cohens kappa test. Serum total 25(OH)D ranged from 33.8nmol/L-169.8nmol/L and plasma ranged from 28.6nmol/L-211.2nmol/L. There was a significant difference for total 25(OH)D based on sample type, with a measurement bias of 7.63mol/L (95%CI5.36,9.90,p=<0.001). The mean difference between plasma and serum concentrations was statistically significant for 25(OH)D₁ (7.38nmol/L;95%CI8.28,9.48 p=<0.001) and Epi-25(OH)D₃ (0.39nmol/L;95%CI0.14,0.64,p=0.014). Of 114 participants, 28% of participants were classified as vitamin D deficient(<50nmol/L) or insufficient(<75nmol/L) based on plasma sample and 36% based on serum sample. Nineteen (16.7%) participants changed vitamin D status category based on sample type. 25-hydroxyvitamin D quantification differed significantly between serum and plasma samples, yielding a higher value in plasma; this influenced vitamin D status based on accepted cut-points.

Evaluation of a diet quality scoring tool to determine data-driven dietary patterns in adults with multiple sclerosis

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Understanding the dietary characteristics of people with relapsing-remitting multiple sclerosis (RRMS) may assist in the planning of nutritional interventions for patients. The aim of the study was to evaluate the validity and psychometric properties of the Dietary Habits Questionnaire (DHQ). A secondary aim was to assess the variation in dietary intake within the sample. Repeated 24-hour recall dietary assessments using the Automated Self-administered Assessment-24 (ASA-24) tool were modelled to usual dietary intakes. The DHQ sub-scores of key nutrients and food groups were calculated and statistically compared with usual intakes. A total of 96 people with RRMS completed the DHQ (median = 84.50; IQR: 77.04, 91.83). Higher DHQ score quartiles were associated with higher intakes of vegetables and fruits (P=0.005). The absolute correlation between the DHQ scores and ASA-24 intake for fruit and vegetables was 0.436 (P<0.001). Principal component analysis using 21 food groups identified five dietary patterns, explained 42.1% of the total variance of intakes. The variations in food intake were for grains, fats and oils, fish and seafood, meats, and vegetables. The results demonstrated that the DHQ might be suitable for use in studies focused on the intake of fruit and vegetables in people with RRMS.

Implementation of the lifestyle PCOS guidelines: perspectives of allied health professionals

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Polycystic ovary syndrome (PCOS) is a common condition affecting up to 13% of reproductive-aged women. Weight and lifestyle management is a key treatment for women with PCOS as recommended in International Evidence-based Guidelines 2018. The perspectives of allied health professionals relating to the provision of lifestyle and weight management with women with PCOS is not known. Semi-structured interviews were conducted in allied health professionals (dietitians, exercise physiologists and psychologists) involved in the management of PCOS in Australia. Interviews were audio-recorded and professionally transcribed. The transcripts were coded inductively and thematically analysed. Fifteen (9 dietitians, 5 exercise physiologist, 1 psychologist) allied health professionals were interviewed. Barriers relating to women with PCOS include insufficient knowledge on lifestyle management, lack of time, socio-economic disadvantage preventing access to lifestyle support and psychological issues such as eating disorders or depression. Barriers relating to health professionals include insufficient knowledge in PCOS and insufficient time during consultation. Barriers relating to the health system include lifestyle recommendations in the PCOS guidelines being too general and weight-focused, funding system does not facilitate long term care and low integration of care between health professionals. These barriers needs to be addressed for the implementation of lifestyle management in PCOS care.

Transcriptomic responses to weight loss: Findings from The Sleeping Well Trial

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Transcriptomics enables the capture a global picture of the individual level molecular adaptations occurring during weight loss and could help tailor personalised nutrition interventions. This study explored the transcriptomic response to a six-month lifestyle intervention in participants with obstructive sleep apnea (OSA) from The Sleeping Well trial and the extent this differed between high (HR) and low responders (LR). A subset of participants (n=18) had RNA from immune cells sequenced pre and post-intervention. Based on changes in waist circumference, weight and OSA severity, participants were grouped into always HR, always LR or mixed. HR had the largest response to the intervention with 3 genes and 17 pathways significantly altered (adj. p value <0.05 and z-score >1.96), followed by the mixed group with 1 gene and 12 pathways significantly altered and LR with 6 pathways only significantly altered. Differences were greater between groups at baseline than the within groups response to the intervention. The largest difference was between HR and mixed with 39 genes and 22 pathways significantly altered. This suggests that differences between HR, LR and mixed, in immune cell transcription, at baseline existed which is not mediated by weight loss.

A pilot tolerability study of a novel dietary strategy for patients with an ileoanal pouch

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A proportion of patients with an ileoanal pouch following proctocolectomy experience bothersome bowel symptoms, and one half develop pouchitis. Microbial metabolites are pathogenically implicated, leading to the development of a new dietary strategy - the 5URE diet. This pilot study aimed to evaluate the tolerability and nutritional adequacy of the diet, and effect on pouch microbial fermentation. Patients with an ileoanal pouch received dietary education targeting intake of readily fermentable fibre, total and specific proteins, fructose, polyols and specific preservatives. After 5 weeks, tolerability (100-mm visual analogue scale), diet acceptability (Diet Satisfaction questionnaire) and nutritional intake were assessed, and faecal pH, and markers of carbohydrate (short-chain fatty acids, SCFA) and protein fermentation (ammonia and branched-chain fatty acids, BCFA) compared with those pre-intervention. Of 12 patients (6 men, mean age 55 years), one with a known pre-pouch stricture withdrew following partial bowel obstruction. Majority (81%) reported good (75-100 mm) tolerability, 73% had high diet satisfaction scores and the diet met most nutritional requirements. Faecal BCFA concentration decreased at week 5 from 0.60(SEM:0.16) to 0.34(0.09)µmol/g (p=0.07), but faecal pH, SCFA, ammonia were unchanged. The 5URE diet was highly tolerated and acceptable and tended to reduce microbial protein fermentation. Further studies are needed.

Indonesian women’s experiences obtaining antenatal nutrition information

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Understanding the information-seeking behaviours of women in pregnancy is critical for developing effective antenatal nutrition education. This study aimed to investigate Indonesian women’s antenatal nutrition information-seeking behaviour and its relationship to socio-demographic
characteristics. Women in Indonesia, who had given birth in the previous two years (n=335, 30±4.8 years), completed an online survey. Information-seeking and characteristics data were analysed using chi square, factor analysis and multiple regression. Women searched for or obtained nutrition information from multiple sources including their husband (98.2%), digital media (96.4%), mothers (in-law) (91.6%), friends (93.4%), and preference to health practitioners, including doctors (89.3%), midwives (81.2%) and nutritionists (52.2%). Factor analysis identified four categories of information sources: 1) family, online and obstetrics sources, 2) friends and relatives, 3) mass media and nutritionists, 4) maternal health resources (midwives, maternal health book, health volunteers). Highly educated and income women were more likely to seek nutrition information from ‘family, online and obstetrics sources’ (Factor 1; p<0.001). Low educated and non-working women were more likely to seek nutrition information from ‘maternal health resources’ (Factor 4; p<0.001). To appropriately target a wide range of women, antenatal nutrition interventions need to consider the different information sources that women across the socio-economic spectrum access.

Perceptions of how diet and ‘Cancer-Related Cognitive Impairment’ influence each other: A qualitative study

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Cancer survivors commonly experience long-term physical and cognitive disruptions that persist beyond treatment cessation. These disruptions can significantly affect quality of life, often resulting in psychosocial changes that require navigation. Diet is important to an individual’s psychophysiology. However, understanding how cancer survivors’ diets and cognition are related has largely been uninvestigated. We aimed to explore: 1) post-treatment dietary changes in cancer survivors with self-reported cancer-related cognitive impairment (CRCI); and, 2) how survivors perceive their diet and cognitive changes to influence each other. Semi-structured interviews were completed with N=15 Australian breast (n=13) and colorectal (n=2) cancer survivors with CRCI (M. time since treatment: 18.7mo ±SD=17.7). Interviews were recorded and major themes identified from transcripts using thematic analysis. Participants reported post-treatment dietary changes: meal timing shifts; less variety; more plant-based food; and, using more ready-made foods. Post-treatment, survivors described finding meal planning more onerous; cooking to have become harder; and having difficulty limiting unhealthy food. A healthy diet was perceived to support cognition particularly via energy/fatigue; although some participants reported diet had no impact. Many survivors perceive a bidirectional relationship between diet and cognitive function. Future research is needed to explore dietary interventions and dietary support needs of cancer survivors with CRCI.

Fruit and Vegetable Knowledge and Intake within an Australian Population: The AusDiab Study

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Understanding the relationship between fruit and vegetable knowledge (FVK) and fruit and vegetable intake (FVI) is important for optimal health promotion. Using data from the Australian Diabetes, Obesity and Lifestyle Study (AusDiab), we investigated associations between FVK and FVI, and demographic and lifestyle factors. Baseline FVK was measured using two self-reported questions. FVI was measured using a validated, self-reported, food frequency questionnaire in 1999/00 (baseline), 2004/05 and 2011/12. Amongst the 8,966 participants assessed at baseline, 24.1% had optimal, 73.0% had insufficient, and 2.9% had poor FVK. Using linear regression, those with insufficient or poor FVK reported lower FVI (grams/day) compared to those with optimal FVK; at baseline [coefficient (95%CI)]: -67.1 (-80.0, -54.3) and -124.0 (-142.9, -105.1); 5 years: -50.4 (-61.4, -39.4) and -122.2 (-152.7, -91.6); and 12 years: -42.5 (-54.6, -30.5) and -94.6 (-133.8, -55.5), of follow-up (all p<0.001). Poor FVK was more likely to be reported in males, older aged (>65 years), socio-economically disadvantaged, smokers, and those with insufficient physical activity/sedentary behavior. Our study demonstrates that knowledge of fruit and vegetable recommendations is strongly associated with FVI, with several demographic and lifestyle factors predicting FVK. Health promotion messages aimed at increasing FVK should target these subgroups for maximal effect.

Lycopene from orange heirloom tomatoes (Moonglow) suppress bone turnover in OVX rats against red tomatoes

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In red tomatoes, 90% of lycopene is trans lycopene; in orange heirloom tomatoes 90% of lycopene is the more bioavailable cis lycopene. This study compared plasma lycopene and bone turnover following red versus orange Moonglow tomato feeding in a rat model of post-menopausal osteoporosis. Female Sprague Dawley rats underwent sham or ovariectomy (OVX) surgery at age 16 weeks. Control sham and control OVX received no dietary supplement; post-red and post-Moonglow received tomato for 8 weeks post-OVX surgery; pre-red and pre-Moonglow received tomato for 8 weeks prior to plus 8 weeks post-OVX surgery (N=15/group). Tomato powder was fed at 0.35 mg lycopene/kg body weight/day. Mean plasma lycopene concentrations in pre and post Moonglow groups were ~6X higher than pre and post red groups. OVX significantly increased bone turnover bio markers CTx-1 and osteocalcin compared to sham. Serum CTx-1 was not significantly different among OVX tomato treatment groups. Pre-red, pre-Moonglow, and post-Moonglow had significantly reduced serum osteocalcin. These results suggest that a six-fold higher intake of red tomatoes would be required to match plasma lycopene concentrations achieved by Moonglow, and that cis but not trans lycopene intake can significantly reduce bone turnover even after menopause-initiated osteoporosis.

Dose dependent effects of vitamin B12 on promonocytic lymphoma cells.
Vitamin B12 could be preventative for cancer due to its role in maintaining healthy function of the immune system and moderation of homocysteine levels, yet the role it’s in tumorigenesis is unclear. Numerous studies indicate that increased serum B12 is associated and prognostic to cancer outcomes. The question raised is, can high serum B12 levels cause cancer or does cancer cause high serum B12? Is there a dosage spectrum effect of B12 intake, whereby higher doses are harmful, but lower doses are necessary to prevent disease? We sought to examine cellular changes of a dose dependent effect of B12 on U937 pro-monocytic lymphoma cells. Proliferation, apoptosis, cell migration, expression of PDL-1, VEGF and cytokines were determined in the presence of B12 high and low doses. It was noted that B12 (low dose) inhibited U937 cell proliferation and migration which was not due to apoptosis or cell death. Conversely, vitamin B12 (high dose) promoted U937 cell proliferation and increased PD-L1 expression suggesting a pro-tumorigenic mechanism. This data gives insights into the dose dependent properties of vitamin B12 at a cellular level and could form the basis for future studies in understanding the mechanistic effects of B12 on cancer cells.

Orthorexic traits found in individuals with irritable bowel syndrome and eating disorders

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Orthorexia is defined as a harmful obsession with eating healthily, and is a novel concept that is not well understood. It has been suggested that orthorexia can develop from illnesses characterised or treated by dietary restriction, including irritable bowel syndrome (IBS) and eating disorders. The aim of this cross-sectional online survey was to measure the prevalence of orthorexia in individuals with IBS and eating disorders compared to healthy controls. Participants with IBS (n=41), eating disorders (n=10) and healthy controls (n=40) were recruited. Orthorexia was measured utilising the SCOFF and eating habits questionnaire (EHQ). One-way ANOVA and Chi-Square tests were used for data analysis. Results are reported as percentage of participants who scored >2 on the SCOFF and mean±SD of EHQ scores. IBS participants exhibited significantly more orthorexic traits than healthy controls (63% vs 34%, p=0.008; 54.90±10.34 vs 43.85±10.22, p<0.001). Eating disorder participants also demonstrated greater orthorexic traits than controls (78% vs 34%, p=0.016; 59.56±12.55 vs 43.85±10.22, p<0.001). There were no significant differences found between IBS and eating disorder groups (63% vs 78%, p=0.410; 54.90±10.34 vs 59.56±12.55, p=0.455). To conclude, there may be a link between orthorexia and IBS. Future research should adopt a prospective study design to examine this relationship further.

The modified casein diet in mental health and cognition: A systematic review of intervention and observational studies

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Exogenous opioid peptides released from the digestion of casein variants (i.e. A1 beta-casein) have been linked to pathways of central importance to mental and brain health (e.g. inflammation). As such, casein-free diets are suggested to have benefits for mental disorders (e.g. schizophrenia), although evidence for its use is equivocal. This systematic review aimed to evaluate associations between modified casein intakes (e.g. casein-free or A2 beta-casein diets) and both mental health symptoms and cognitive function. CINAHL, Embase, Cochrane, Scopus and PudMed databases were searched from inception to August 2020. Studies (intervention or observational) that (1) compared restricted or controlled intake of casein to comparator diets, and (2) measured mental health symptoms (e.g. anxiety, depression, bipolar disorder or schizophrenia) or cognitive function, were included. Animal, supplemental and studies in developmental disorders were excluded. After de-duplication (N=1384), the abstract and titles of 2594 studies were screened. Preliminary findings revealed three studies met eligibility criteria; all studies examined differences between consumption of milk containing A1/A2 beta-casein vs A2 beta-casein on cognitive function. No studies evaluated the impact of a casein-free diet on mental health symptoms. Findings point towards the need for prospective trials evaluating the impacts of casein-free diets on mental health symptoms.

Comparing food-related quality-of-life and psychosocial sensations between healthy controls, patients with IBS, and patients with a history of an eating disorder

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Irritable bowel syndrome (IBS) is a disorder where recurrent abdominal pain is associated with defecation or changes in bowel habits. Psychosocial sensations are reported at higher rates in people with IBS and eating disorders (EDs). The aim of this cross-sectional study was to compare anxiety, depression, and food-related quality-of-life (FRQOL) scores in people with IBS and EDs compared to healthy controls. 91 participants (54 IBS, 10 ED, 27 healthy controls) completed the Hospital Anxiety and Depression Scale (HADS) and the FRQOL questionnaire online. A one-way ANOVA and Post-Hoc tests were conducted to determine significant differences between groups. One-way ANOVA showed statistically significant differences between the three groups in anxiety, depression, and FRQOL (p<0.05). Tukey’s Post-Hoc test found ED participants had significantly higher anxiety scores than healthy controls (p=0.01) and IBS participants had higher depression scores than healthy controls (p=0.055). Healthy controls had significantly better FRQOL scores than both IBS and ED participants (p<0.05), and ED participants had better FRQOL scores than IBS participants (p=0.07). There may be overlapping links between psychosocial sensations and FRQOL in participants with IBS and EDs. These findings may help improve understanding and clinical awareness of the psychosocial factors and FRQOL in IBS and EDs.

Understanding young Australian adults’ views on Energy Dense and Nutrient Poor Foods (EDNP) using qualitative research

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Excessive consumption of EDNP foods are known to be detrimental to human health. However, few studies have examined the influence of demographic and socio-psychological variables on EDNP food behaviours among young Australian adults. This study explores young Australian adults' views and experiences of EDNP foods, focusing on the transition between dependant and independent living. In this phenomenological study, data were gathered from participants through semi-structured interviews. Participants included young Australian adults aged between 18-30 years. Data were collected Australia-wide through online/telephonic interviews. Data were qualitatively analysed. Thirty interviews have been conducted so far. Preliminary analyses reveal that EDNP foods were viewed as ‘treat’ foods. EDNP foods were often consumed during leisure times and during the latter part of the day. Weekends, celebrations, social and familial gatherings were the most common occasions for consumption. Making healthy food-choices not only required exercising conscious effort but warranted a need to practise a habit of avoiding unhealthy foods and self-awareness. It is hoped that the findings from this study will provide ways of understanding poor food choices made by this cohort. This research necessitates the need to focus on demographic and socio-psychological variables to reduce the high EDNP food behaviour.

**Lower glycemic index foods and beverages and the drive to eat: A systematic review and meta-analysis of randomised controlled trials**

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The drive to eat includes subjective perceptions of hunger, fullness, appetite and satiety, or more objective ad libitum intake of foods, or circulating levels of appetite-regulating hormones. We conducted a systematic review and meta-analysis of randomised controlled trials of the effect of glycemic index (GI) foods/meals/diets in humans of all ages on the drive to eat. Thirty-five studies (28 publications, n=609 participants) met our inclusion criteria and were eligible for meta-analysis. Average GI in the lower versus higher group were 44.5 and 78.6, respectively. Lower GI foods/meals/diets compared to higher GI comparators, significantly improved measures of the drive to eat, overall (Standardised Mean Difference (SMD) -0.17, 95%CI -0.30, -0.05, p=0.008). Similarly, lower GI foods/meals/diets compared to higher GI comparators, significantly improved subjective measures of the drive to eat (satiety, appetite, fullness and hunger) overall (-0.10, 95%CI -0.19, -0.02, p=0.020). For satiety, there was a statistically significant improvement (-0.22, 95%CI -0.37, -0.08, p=0.002). Finally, there was a lower food intake in the hours after consumption of a single lower GI food or single meal compared to higher GI comparators (-0.22, 95%CI -0.32, -0.12, p<0.001). Overall, the evidence suggests that there is a causal relationship between the consumption of lower GI foods and increased satiety.

**Consumer perceptions of locally-grown produce during the COVID-19 pandemic**

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The COVID-19 pandemic temporarily disrupted Australian food supply chains and social distancing restrictions impacted the experience of shopping for food. A cross-sectional survey in May to June 2020 explored consumer perceptions of locally-grown produce during the COVID-19 pandemic, including the importance of locally-grown produce, and consumer shopping and consumption habits. Survey data (n=1170) indicated that the majority of respondents (89%) highly valued locally-grown produce. Most respondents (54%) reported that locally-grown produce was more important as a result of the COVID-19 pandemic, with rural respondents ($\chi^2=13.3; p=0.01$) and respondents aged >55 years ($\chi^2=40.1, p=0.005$) more likely to report it was extremely important. Nearly half of respondents (43%) reported buying more locally-grown produce, with fruits and vegetables the most commonly purchased foods. Respondents aged >55 years bought more locally-grown produce in comparison to younger respondents ($\chi^2=59.4, p=0.001$). Those who bought ‘somewhat less’ or ‘a lot less’ were more likely experience food insecurity ($\chi^2=31.7; p<0.001$). Locally-grown produce was purchased at independent supermarkets (75%) and major supermarkets (65%), highlighting the convenience of these outlets. Respondents demonstrated a clear preference for locally-grown produce and sustained purchasing of these foods throughout the recovery from the COVID-19 pandemic will assist with strengthening the local economy.

An evaluation of dietetic service in functional dyspepsia: Comparison of low FODMAP advice with standard dietetic advice

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Certain dietary constituents may provoke symptoms of functional dyspepsia (FD, e.g. postprandial pain, early satiety). Evidence for specific dietary approaches is lacking but a low FODMAP diet (LFD) is frequently used in practice. This service evaluation aimed to compare the effectiveness of LFD with standard advice (STD; e.g. caffeine/alcohol restriction) in FD.

Data was collected from 59 consecutive eligible patients with FD attending an initial and review dietetic outpatient appointment at Princess Alexandra Hospital. Of these, 40 received LFD advice and 19 received STD advice. As part of usual care, the Structured Assessment of Gastrointestinal Symptoms (SAGIS) was used to assess epigastric (max 28 points) and overall gastrointestinal symptoms (max 88 points). Symptom change was compared between groups adjusting for baseline differences.
There was a greater reduction in epigastric score for LFD versus STD (-3.6 [-4.9, -2.2] vs -0.9 [-2.9, 1.1], p=0.032) and total symptom score (-9.4 [-12.4, -6.4] vs -3.3 [-7.7, 1.1], p=0.026). A greater proportion receiving LFD advice achieved a 30% reduction in epigastric score versus STD (50% vs 16%, p=0.012). Dietary adherence did not differ between groups (p=0.497).

The LFD may be beneficial for improving FD symptoms. A randomised controlled trial is required to substantiate these findings.

**Perceptions of nut consumption in Australian health professionals and consumers**

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Habitual nut consumption is associated with reduced risk of chronic diseases such as coronary heart disease, however, consumption levels in Australia are below recommendations. Previous research has identified confusion regarding the benefits of nut intake among health professionals and consumers. The aim of this study was to explore perceptions of nut consumption in Australian health professionals and consumers. Two self-administered online surveys were developed. A total of 204 health professionals and 71 consumers completed the surveys. Health professionals demonstrated basic nutrition knowledge regarding nut consumption, however, non-dietitians/nutritionists lacked knowledge of long-term health benefits of nut consumption such as the effects of nut intake on blood cholesterol and risk of cardiovascular disease. Similar findings were observed among consumers. Confusion on the effects of nut intake on body weight was prominent among both health professionals and consumers with 12% and 16% respectively, believing regularly consuming nuts causes weight gain. Health professionals could greatly benefit from further education, and they should be encouraged to promote regular nut consumption to patients and clients to help address misinformation among consumers. Further education among consumers would also be beneficial. Collectively this could improve population nut intakes in Australia.

**Comparison of extraction methods and solvent composition for Australian blueberry anthocyanins**

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Blueberry anthocyanins are known to contribute to various health benefits as protecting against diabetes, cancer and cardiovascular diseases. There are many factors affecting anthocyanin stability including exposure to heat, light, and oxygen making it difficult to extract anthocyanins without denaturing their properties. The aim of this research was to determine a suitable extraction method and solvent composition for anthocyanin compounds. The method was evaluated for linearity, food
matrix effect, instrumental detection, and quantification limits. Fresh blueberry anthocyanins were extracted with different solvent compositions: methanol/water (60/40 v/v), methanol/water (70/30 v/v), methanol/water (80/20 v/v), ethanol/water (60/40 v/v), ethanol/water (70/30 v/v), ethanol/water (80/20 v/v) at pH 2.0 and pH 3.0 using ultra-sonication, geno grinder and dounce grinder methods and quantified by liquid chromatography mass spectrometry. All calibration curves showed linearity of 0.999 or higher. The total anthocyanin glucoside content ranged from 55.8±0.7 mg to 84.9±1.2 mg per 100 g of blueberries. Malvidin-3-glucoside was found to be the major anthocyanin extracted from all solvent compositions and extraction methods tested. This study showed that of the methods tested ultrasonication had the greatest effect on extraction yield producing a reliable anthocyanin quantification method. These extraction procedures will allow potential use of blueberry anthocyanins in future research.

Exploring issues to be addressed in a food literacy program for parents of young children from disadvantaged areas.

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Childhood provides an optimal opportunity for growth and development and parents play a fundamental role in forming good eating habits in their children. A healthy diet improves quality of life and wellbeing and reduces the risk of chronic disease. The aim of this research was to explore the challenges of providing healthy diets for 0-5 year old children. This research formed part of the formative research to develop a food literacy program for parents with young children from disadvantaged areas of Western Australia.

This qualitative study employed a general inductive inquiry approach. Eight focus groups were conducted with 67 parents living in low socio-economic areas within the Perth metropolitan region. Participants were recruited through community based parenting organisations. Themes identified from the focus group data were aligned with relatedness, autonomy and competence within the Self Determination Theory.

Implications for the program identified from the themes include importance to build trust and rapport with parents attending the program. A food literacy program needs to place emphasis on the importance of parents creating environments that support responsive parenting practices and create opportunities for parents during the program to practice behaviours that build their child’s autonomy and competence around eating healthy food.

The Impact of Delaying Departure on Ad Libitum Consumption of a Laboratory Breakfast Meal

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Laboratory studies assessing dietary behaviour often employ different defined post-prandial delay (DPD) periods before participants are permitted to leave. The aim of this study was to examine the impact of varying DPD periods on dietary intake and subjective appetite responses at an ad libitum
buffet breakfast. 24 participants (age: 23.4 ± 6.3 y; BMI: 23.9 ± 3.9 kg·m$^{-2}$) completed three laboratory trials following a quasi-randomized, crossover design. Each trial incorporated a DPD period of either 0hr, 1hr or 3hr following breakfast. On completion of the DPD period, subjective ratings of appetite were recorded, before participants departed the laboratory. One-way repeated measures ANOVA were used to analyse results, with post hoc paired-sample t tests conducted on significant main effects. Breakfast energy and CHO intakes were significantly lower on the 0hr compared to 1hr ($p = 0.014$) and 3hr trials. Ratings of hunger were significantly higher ($p < 0.01$) on the 3hr compared to both 0hr and 1hr DPD trials. Delaying participants from leaving a laboratory alters dietary intake of an *ad libitum* test meal and subsequent subjective responses. The post-meal delay period appears to be an important methodological characteristic capable of altering the results of laboratory feeding studies.

The “Omega Kid” Feasibility Study: A double-blind randomised placebo-controlled trial investigating the effect of omega-3 supplementation on self-regulation in preschool aged children

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Self-regulation in early childhood impacts children’s success at school and is a predictor of health, wealth and criminal outcomes in adulthood. There is evidence that self-regulation may be optimised by supplementation of omega-3 long chain polyunsaturated fatty acids (n-3 LCPUFA). The aim of the “Omega Kid Study” is to investigate the feasibility of n-3 LCPUFA supplementation on self-regulation in preschool-aged children. A double-blind randomised placebo-controlled trial of 12 weeks duration assessed the effect of 1.6g of eicosapentaenoic acid (EPA) and docosahexaenoic acid (DHA) per day in a microencapsulated powder compared to placebo. Children (n=78) aged 3-5 years old were recruited and randomly allocated to the treatment or placebo group. The HS-Omega-3 index served as a manipulation check for the intervention. 58 children (76%) completed the intervention. Compliance to the study protocol was high with 92% of children providing a finger prick blood sample at baseline and high adherence to the study intervention (88%). Results indicate that the protocol is feasible and the data from this trial can be used for a sample size calculation to design an adequately powered clinical trial to further test the hypothesis that n-3 LCPUFA supplementation will improve the self-regulation of preschool-aged children.
Prediction of intramuscular fat content of fresh intact lamb loin using Near Infrared Spectroscopy

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Fat content of lamb varies greatly within cuts from the same animal and between animals due to environmental and genetic factors. While it is vital to the nutritional composition and eating quality of fresh lamb cuts, there is currently no method for the determination of fat content which is suitable for use by Australian lamb processors. Therefore, the aim of the current study was to determine the potential for Near Infrared (NIR) spectroscopy to predict the fat content of lamb loins.

To this end, 299 lamb loins were measured using an ASD® TerraSpec4 high resolution spectrometer with the ASD® contact probe attached via a fibre optic cable before a section was excised for wet chemistry analysis using a modified Soxhlet method. Prediction of the fat content using partial least squares (PLS) analysis indicated it is possible to predict the fat content with good accuracy ($R^2 = 0.6$ and RMSE = 0.84), however further work is needed to optimise models as the fat content of lamb loin is not normally distributed which is challenging for PLS analysis methods.

Demographic correlates of plant-based diet quality among Australian adults: findings from a nationally representative cross-sectional study

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There is increasing interest in adopting plant-based diets for health and sustainability reasons, however little is known about the consumers of plant-based diets. This study aimed to explore the demographic correlates of plant-based diet quality among Australian adults. Using data from the Australian Health Survey (2011-2013), dietary intakes from two 24hr recalls were used to calculate three plant-based diet quality indices: an overall plant-based diet index (PDI); a healthful plant-based diet index (hPDI); and an unhealthful plant-based diet index (uPDI). Linear regression analyses were used to evaluate the association between each PDI and age, sex, education (non-school qualification, diploma/certificate, tertiary), physical activity (meeting physical activity guidelines), and smoking status (current smoker, ex-smoker or never smoked). Males and females (n=5,105) aged 18-84 years were included. Higher hPDI was associated with being older. PDI and hPDI were associated with being female, a higher education level, meeting physical activity guidelines and having never smoked/ex-smoking. uPDI was associated with being younger, male, lower education, not meeting physical activity guidelines and currently smoking. These findings add to the emerging literature on consumers of plant-based diets and can inform dietary advice and policies that aim to increase intake of healthy plant-based foods among Australian adults.

Development of Raman Spectroscopy as a tool to verify Australian beef labelling claims
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The current method of verifying the production systems of beef in Australia is dependent on audits and reliant on producers following the requirements set by processors, which vary for individual grain and grass-fed brands. Consequently, there is a need for a non-destructive on-site method to differentiate between production systems. This research tested the viability of Raman Spectroscopy to accurately discriminate between production systems.

Subcutaneous fat from 505 beef cattle carcases was collected and scanned using a 785nm Mira handheld device (Metrohm) Raman device. Cattle represented 100-day grain fed, 70-day grain fed, grass supplemented and grass-fed production systems. Using Partial Least Squares Discriminant Analysis, a model was developed that was able to accurately predict the production systems of origin for 100-day grain fed (97%), 70-day grain fed (93%), grass supplemented (95%) and grass-fed (91%) carcases. This study assessed the viability for an objective carcase measurement for the verification of production system labels and found Raman Spectroscopy to be a non-destructive and rapid tool with the ability to discriminate between various production systems.

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Ultra-processed food (UPF) consumption amounts to roughly half of dietary energy consumed by Australians. However, little is known about how UPF consumption is distributed among socio-demographic groups. This study examined whether socio-demographic characteristics vary by consumption of UPFs in a cross-sectional nationally representative survey of Australian adults. Dietary and socio-demographic data collected from the Australian Health Survey 2011-13 (n=8,209 aged\( \geq \)19 years; mean age 49.5 years (SD 17.1)) were analysed. UPFs were identified using the NOVA classification system. Adjusted linear regression analyses were used to examine associations between dietary share of UPF (% of total energy intake, continuous) and socio-demographics (sex, age, country of birth, area level disadvantage, education, household income, and rurality). UPF consumption was higher among the youngest adults (aged 19-30 years), adults born in Australia, those experiencing greatest area level disadvantage, lower educated adults, and the second lowest household income quintile. There was no evidence of an association with sex and rurality. This research adds to the body of evidence on dietary inequalities across Australia and can be used to inform the development of policies and guidelines to promote healthy diets in Australia.

Differences and determinants of vitamin D deficiency among UK Biobank participants: a cross-ethnic and socioeconomic study
Few contemporary cross-ethnic studies have investigated the prevalence and determinants of very low 25-hydroxyvitamin D [25(OH)D] concentrations.

We conducted cross-ethnic analyses on the prevalence and determinants of vitamin D deficiency (25(OH)D ≤ 25 nmol/L) using data from 440,581 UK Biobank participants, of which 415,903 identified as White European, 7,880 Asian, 7,602 Black African, 1,383 Chinese, and 6,473 of mixed ancestry. Determinants of deficiency were examined by logistic regression.

The prevalence of 25(OH)D deficiency was highest among participants of Asian ancestry (57.2% in winter/spring and 50.8% in summer/autumn) followed by those of Black African ancestry, mixed, Chinese, and White European ancestry. Participants with higher socioeconomic deprivation were more likely to have deficiency compared to less deprived (P = < 1 x 10^-300). In fully-adjusted analyses, regular consumption of oily fish was associated with reduced odds of vitamin D deficiency across all ethnicities, while outdoor-time in summer was less effective for Black Africans (OR 0.89, 95% CI 0.70, 1.12) than White Europeans (OR 0.40, 95% CI 0.38, 0.42).

Severe vitamin D deficiency remains an issue throughout the UK, particularly in lower socioeconomic areas. In some groups, deficiency is alarmingly high with one-half of Asian and one-third of Black African ancestry populations affected across seasons.

Texture modified foods for aged care: current challenges, future opportunities

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Dysphagia prevalence is increasing in residential aged care. Producing texture modified foods (TMF) for dysphagia sufferers at the correct consistency and nutrient density is complex and requires time and specific knowledge. Better understanding current practices and challenges is essential to develop adequate solutions, in the form of products or services, that improve the quality of TMF.

An online survey was sent to 1700 residential aged care homes across Australia. The survey included 59 questions on menu planning, meal choice, kitchen set up, equipment, challenges associated with TMF and resident’s complaints.

The findings of this survey elucidated the challenges associated with TMF in aged care. Opportunities exists to leverage new technologies to improve product appearance, flavour, and consistency, while ensuring ease of preparation in aged care. Improved TMF can provide dysphagia sufferers with appealing, tasty and nutritious products that will improve their health and well-being.

Identifying and overcoming Australians barriers to accepting edible insects as an emerging protein source
Increasing populations and the limitations on finite resources will see greater pressure on an already strained food system and of particular concern is protein. Insects offer a nutritious and sustainable protein source, yet despite a rich history, Australians have been hesitant in adopting the practice. This study aimed to identify barriers and explore possible factors that may motivate Australians to accept edible insects as a new source of protein. Participants (n=601; 76.2% female, 23.8% male; aged 18-35 years 40.8%, 36-54 years 43.6%, >55 years 15.6%) completed an online survey investigating Australian consumers' barriers to eating insects and what potential motivating factors may overcome these obstacles. Results indicated participants cited ‘lack of opportunity’ (56.3%) and ‘disgust’ (17.7%) as the main barriers to eating insects. ‘increased insect nutrition knowledge’ (56.6%) and ‘increased accessibility to insect-based products (56.4%) were identified as a major factor that may help overcome barriers to consuming edible insects. The outcomes of this study indicate that by providing increased nutritional knowledge, opportunity and accessibility to insect-based products, it may be possible a higher proportion of Australians would be acceptance of eating insects. Consumer focused food product and process innovation for developing new food products containing insect ingredients is required.

**Dietary patterns of Australian pre-schoolers and associations with haem and non-haem iron**

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Inadequate iron intake or intakes of iron with low bioavailability are major causes of iron deficiency among children of high-resource countries. This study aimed to describe Australian pre-schooler dietary patterns and examine their associations with dietary iron intakes. Data (2 x 24-h recalls) from the 2011-12 National Nutrition and Physical Activity Survey were analysed (n = 812, 2 to < 6 years old). Usual intakes were estimated via Multiple Source Method. Dietary patterns were extracted via principal component analysis. Associations between dietary patterns and energy-adjusted iron intakes were examined using linear regression. Mean (SD) usual total dietary and haem iron intakes were 6.3 (1.9) and 0.5 (0.3) mg/day, respectively. Three dietary patterns were identified. Pattern 1 (positive loadings for cheese, breads, fats and oils, and water) was positively associated with dietary iron intakes (β = 0.08, 95% CI: 0.01, 0.15). Pattern 3 (positive loadings for red meat, fortified fruit and vegetable products, and sauces and spreads) was inversely associated with dietary iron (β = -0.08, 95% CI: -0.14, -0.01) and non-haem iron (β = -0.09, 95% CI: -0.15, -0.02) intakes. No dietary patterns were associated with haem iron intakes. Future research should target iron bioavailability of Australian pre-schooler diets.

**Flavonoids as Human Intestinal Carbohydrate Digestive Enzyme Inhibitors**

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Flavonoids are the largest family of plant-based (poly)phenolic bioactive compounds, with growing evidence showing health-protecting effects, particularly against diabetes. Some compounds influence glucose metabolism by inhibiting enzymes involved in carbohydrate digestion and suppress
intestinal glucose absorption. In this study, the ability of four flavonols (quercetin, kaempferol, quercetagetin and galangin) to inhibit α-glucosidases (sucrase, maltase and isomaltase) were evaluated individually, compared with acarbose and EGCG. Cell-free extracts from human intestinal Caco2/TC7 cells highly expressing brush border α-glucosidases were used. Glucose, sucrose, fructose, isomaltose and maltose were detected using HPAE-PAD with high accuracy, precision and sensitivity. Acarbose showed inhibition of sucrase, maltase, and isomaltase activities at comparably lower IC50 values of 1.65, 13.9 and 39.1 microM respectively. A similar inhibition pattern but higher values were observed with EGCG. Stronger sucrase inhibition was seen with quercetagetin, similar to acarbose, followed by galangin and kaempferol, and weakest by quercetin and EGCG. Similar results were observed for maltase but with a lower inhibition. All flavonols showed a similar isomaltase inhibition to acarbose at a lower inhibition (<29%), while higher EGCG concentration was required to achieve maximum inhibition. This highlights the potential of flavonoids to inhibit human intestinal enzyme activities in the breakdown of carbohydrates.

Can an app accurately record the food and drinks that are sold over the counter in Tasmanian primary school canteens?

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In Tasmania very few school canteens have cash registers, making it difficult to collect information on items sold. Data on food and beverages that are pre-ordered can be used, however, this does not capture items sold over the counter, which are often less healthy. This study examined if an app can accurately record food and drinks sold over the counter (sales) in school canteens. The app was on a tablet and customised for each school. During Term 4 2019, students or canteen staff used the app to record sales at five Tasmanian primary schools each day the canteen was open for one week. A researcher counted items available for sale over the counter before and after recess and lunch (manual sales). Each day, the difference in the number sold was calculated as app sales minus manual sales. Sales were recorded for a total of 14 days. The number of items available over the counter ranged from 9 to 25. Mean difference between app and manual sales was 0.46 (range -1.5–3.6) items/day. The app was an accurate method for collecting counter sales. Combined with pre-ordered sales it would enable scalability for assessing interventions to influence the sale of healthy foods.

Do the dietary guidelines evidence reviews answer the right questions?

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The development of dietary guidelines usually begins with a review of the available evidence to answer specific questions designed to summarise the evidence underlying food, diet and health relationships. These evidence reviews have come under scrutiny in the past for a limited nutrient focus and lack of rigour but recent guideline processes have attempted to deliver more rigorous but also more broadly applicable guidelines. However dietary guidelines still have limited resonance with the public. To understand the focus of dietary guidelines evidence reviews, we analysed and compared the research questions addressed by the most recent dietary guidelines in Australia, Canada, the UK and the USA. The analysis showed that, despite regular reference to the importance...
of dietary patterns, the majority of research questions still focussed on single food group or nutrient relationship with health outcomes. In addition, there were only a limited number of research questions that addressed age and stage of life variations. No questions addressed social determinants of food consumption and consumer concerns and sustainability were secondary issues. The healthiness of a diet is dependent not only its composition and construction but also requires consideration how attractive and achievable and sustainable it is for consumers to adopt.

**Using antenatal colostrum expression as a tool to help new mums with breastfeeding**

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Background and aim: The use of antenatal colostrum expression in the weeks prior to birth teaches mothers the skill of hand expression and also allows for colostrum to be collected and stored before baby’s arrival. As a result, new mothers may be less likely to use formula in hospital and breastfeed for longer, but few large-scale studies exist. Typically, antenatal colostrum expression instruction relies on personal education, making large interventions costly. We aimed to determine whether an expert instructional video can improve knowledge and confidence around antenatal colostrum expressing, and be implemented into a hospital trial.

Methods: With feedback from our community committee and an International Board Certified Lactation Consultant, we developed an instructional video on antenatal expressing and storage of colostrum. Pregnant women were asked to complete a questionnaire pre and post-watching the instructional video online.

Results: 95 pregnant women completed both pre- and post-questionnaires. Total antenatal colostrum expression knowledge scores improved by 106% after watching the video (P<0.001). and confidence also improved by 69% (P<0.001).

Conclusions: We have now begun an intervention trial investigating whether the video is equivalent to personal instruction, and whether it can help avoid formula use in hospital and improve long term breastfeeding rates.