

(in Iran); and issues for different stages of life. Participants also noted obstacles in teaching food knowledge in engaging ways and identified practical strategies to improve students' knowledge.

**Conclusions:** These findings provide policy makers and curriculum developers with a framework against which to assess education curricula and practical learning and teaching strategies to optimise students' knowledge of nutrition and food systems. These data will be compared with similar data from Australia.

**Funding source(s):** N/A.

#### DELIVERING A VERY EARLY NUTRITION INTERVENTION FOR CANCER PATIENTS AT HOME USING TECHNOLOGY: A PILOT RANDOMISED TRIAL

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**Background/Aims:** This study aimed to effectively deliver a tailored very early nutrition intervention to newly diagnosed upper gastrointestinal cancer patients whilst in their own homes compared with standard nutrition care (SNC), i.e. inpatient referral.

**Methods:** Patients were randomised to home nutrition intervention (HNI) or SNC. HNI commenced at diagnosis and continued weekly for 18 weeks. Data were collected at baseline, and at the week 26 follow-up. The primary outcome was Health-Related Quality of Life (HR-QoL) using the EORTC QLQ-C30 tool. Nutritional status was evaluated using the Patient Generated-Subjective Global Assessment. Patient perception of nutrition counselling was assessed by questionnaire. Data were analysed using linear mixed model analyses.

**Results:** At baseline the prevalence of malnutrition was similar between groups (90%). Compared with SNC ( $n = 11$ ), the HNI ( $n = 10$ ) group had a significantly higher EORTC global QoL score (28.4, 95%CI 21.3, 35.4, adjusted for baseline,  $p < 0.001$ ). Six deaths occurred during the study, five in SNC and one in HNI group ( $p = 0.06$ ). Nutritional risk score was lower ( $p < 0.001$ ) and loss of body weight attenuated ( $p < 0.001$ ) in the HNI group compared with SNC. The perceptions about nutrition counselling delivered via phone vs. SNC were not different.

**Conclusions:** Delivery via telephone of a very early and intensive nutrition intervention, to newly diagnosed upper gastrointestinal cancer patients improved QoL and nutritional markers. This intervention is now being tested using an e-platform to further expand the delivery options of nutrition care to cancer patients in their home.

**Funding source(s):** Southern Melbourne Integrated Cancer Services; Nutricia Research Foundation.

#### IMPACT OF A NUTRITION PROMOTION SCHEME ON THE DIETARY INTAKE OF TWO-TO-FOUR YEAR OLDS ATTENDING LONG DAY CARE

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**Background/Aims:** Nutrition promotion schemes such as Start Right Eat Right (SRER) commonly work in partnership with long day care centres (LDCC) to ensure that menus provide 50% age-appropriate nutrient reference values (NRVs). This study aimed to evaluate the impact of SRER on the dietary intakes of children aged 2–4 years while in care.

**Methods:** Twenty South Australian LDCC participated in SRER and dietary intake (morning/afternoon tea, lunch) of children's aged 2–4 years ( $n = 236$  baseline,  $n = 232$  follow up) was assessed pre- and post-SRER implementation using the plate wastage method. Intervention fidelity was assessed. Pre/post comparisons were made using  $t$ -tests.

**Results:** At follow up, 80% of centres were fully compliant with the SRER award criteria. Intake increased for all core food groups (range 0.2–0.4 servings,  $p < 0.001$ ) except for vegetables, 0.4 (95%CI: 0.0, 0.9) servings at

baseline vs. 0.5 (0.0, 1.0) servings at follow up,  $p = 0.083$ . Energy intake increased ( $1629.7 \pm 742.7$  kJ vs.  $1790.6 \pm 820.4$  kJ,  $p = 0.032$ ), but remained below 50% of the NRV for 2–4 year olds. Macronutrient provision and consumption met the NRV benchmark, except saturated fat. Nutrient provision and consumption met the benchmark, except sodium, potassium and fibre. Food waste (difference between servings provided versus consumed) ranged from 0.1 for dairy foods to 0.3 for grains, vegetables and fruit. The degree of waste was consistent between time points.

**Conclusions:** The benchmark recommended for LDCC menus may warrant revision to 40% of NRVs. In addition to policy and menu strategies, additional nutrition promotion strategies may enhance children's dietary intake and minimise food waste.

**Funding source(s):** SA Health, UniSA.

#### MOTIVATORS, BARRIERS AND BENEFITS OF FAMILY MEALS WITH YOUNG CHILDREN IN AUSTRALIA

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**Background/Aims:** Family meals are likely to be an important setting for nutrition promotion, but little is known about young children's family meals. This study's aim was to investigate motivators, barriers and benefits of family meals with children aged six months to six years.

**Methods:** Parents of Australian children were invited through websites and blogs to complete an online survey. Ordered logistic regression analyses were conducted.

**Results:** Preliminary data from 464 parents showed 92% viewed family meals as important, with most agreeing they are a time to promote healthy child eating (91%) and social behaviours (95%), and to connect and talk (90%). Respondents generally enjoyed family meals (95%), though 33% reported they were sometimes a setting for disagreements, and 38% reported difficulty finding time to eat together, with working hours being a common challenge. Topics of most interest to parents were ways to: make eating together easier (37% very interested), make preparing meals easier (37%), grow food at home (38%) and recipes (61%). Frequency of family meals was not associated with child fruit or vegetable intakes, however, frequency of parent and child eating the same foods at dinner was associated with child vegetable intake ( $p = 0.04$ ).

**Conclusions:** Frequency of family meals is motivated by both nutrition and social factors, but parents face a number of challenges and would like information to address these. Parents and children eating the same foods at mealtimes is likely to be an important influence on child nutrition and a relevant topic for nutrition promotion.

**Funding source(s):** N/A.

#### NUTRITIONAL KNOWLEDGE OF AUSTRALIAN GENERAL PRACTICE REGISTRARS: RESULTS OF AN ON-LINE QUESTIONNAIRE

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**Background/Aims:** Nutrition education in entry-level medical courses in Australia is minimal. We aimed to assess nutritional knowledge and self-perceived nutrition competency in registrar members of General Practice Registrars Australia (GPRA), i.e. trainee doctors soon to be working independently as general practitioners (GPs) within the community.

**Methods:** GPRA invited registrars by e-mail to participate in an anonymous on-line survey taking approximately 8 min to complete. Hampers worth \$100 were awarded to the 1<sup>st</sup>, 50<sup>th</sup>, 100<sup>th</sup>, 150<sup>th</sup> and 200<sup>th</sup> respondents.

**Results:** While 147 trainees took part, only 89 [20 males (22.5%) and 69 females (77.5%)] completed all questions. Most were aged up to 30 years (48.3%), with 42.7% aged 31 – 40 years. Half (50.6%) were in their first two years; 49.4% had completed 75% or more of the GP training. Given a patient with high cholesterol and LDL-cholesterol, a body mass index of 28 kg/m<sup>2</sup> and seated blood pressure of 128/85 mmHg, most trainees chose weight loss (84%), reduction of saturated fats (90%), a maximum of two alcoholic drinks/day (82%), and increasing vegetable intake (83%) as 'highly appropriate' strategies. Only 51% put salt reduction in this category; 10% felt this was 'not appropriate'. Two-thirds of trainees (66.0%) were 'moderately

confident' (50.5%) to 'very confident' (15.5%) in providing nutritional recommendations; around one-third (29.0%) were 'somewhat confident'.

**Conclusions:** Despite their confidence in providing advice, GP trainees demonstrated incomplete knowledge of nutritional recommendations. Medical schools must provide doctors with crucial nutritional knowledge to help prevent chronic disease in the community.

**Funding source(s):** The Almond Board of Australia.

### Concurrent session 3: gut health and nutrigenomics

#### PROBIOTIC YOGHURT AND INCIDENCE OF DIARRHOEA IN CHILDREN: A DOUBLE BLIND, RANDOMISED, CONTROLLED TRIAL

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**Background/Aims:** To estimate the efficacy of a probiotic yogurt compared to a pasteurised yogurt for the prevention of antibiotic-associated diarrhoea in children.

**Methods:** This was a multisite, randomised, double-blind, placebo-controlled clinical trial conducted between 2009–2012. Children aged 1–12 years on antibiotics were randomised to receive 200 g/day of either yogurt (probiotic) containing *Lactobacillus rhamnosus* GG<sup>®</sup> (LGG<sup>®</sup>), *Bifidobacterium lactis*<sup>®</sup> (Bb-12<sup>®</sup>) and *Lactobacillus acidophilus*<sup>®</sup> (La-5<sup>®</sup>) or a pasteurized yogurt (placebo) for the duration of their antibiotic treatment. Stool frequency, and consistency were recorded for the duration of treatment plus one week. Primary outcome was stool frequency and consistency, classified at different levels of diarrhoea severity. Due to small number of cases of diarrhoea, comparisons between groups were made using Fisher's exact analysis.

**Results:** Seventy children completed the trial (36 placebo and 34 probiotic). There were no incidents of severe diarrhoea (stool consistency  $\geq 6$ ,  $\geq 3$  stools/day for  $\geq 2$  consecutive days) in the probiotic group and six in the placebo group ( $p = 0.025$ ). There was also only one episode of minor diarrhoea (stool consistency  $\geq 5$ ,  $\geq 2$  stools/day for  $\geq 2$  days) in the probiotic group compared to 21 in the placebo group ( $p < 0.001$ ). Probiotic group reported fewer (one abdominal pain, one vomiting, one headache) adverse events than the placebo group (six abdominal pain, four loss of appetite, one nausea).

**Conclusions:** A yogurt combination of LGG<sup>®</sup>, La-5<sup>®</sup> and Bb-12<sup>®</sup> is an effective method for reducing the incidence of antibiotic-associated diarrhoea in children.

**Funding source(s):** Parmalat Australia.

#### THE IMPACT OF GASTROINTESTINAL SYMPTOMS AND DERMATOLOGICAL INJURIES ON NUTRITIONAL INTAKE DURING EXTREME ENDURANCE EVENTS

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**Background/Aims:** Gastrointestinal symptoms (GIS) and dermatological injuries (DI) are commonly reported after endurance running. The current study aimed to determine whether GIS and DI influences nutritional intake of ultra-runners during a 230 km multi-stage ultra-marathon (MSUM) conducted in hot conditions (32–40 °C) and a 24-hours continuous (122–208 km range) ultra-marathon (24h) conducted in temperate conditions (0–20 °C).

**Methods:** *Ad libitum* food and fluid intakes of ultra-runners (MSUM  $n = 74$ , 24h  $n = 25$ ) were recorded throughout competition in real-time and analysed by dietary analysis software. A GIS and DI medical log was used to monitor symptoms throughout both events. ANOVA was used to analyse nutritional intake data between no-GIS vs. GIS, no-DI vs. DI; and severity of symptoms and injuries.

**Results:** GIS were reported by 85% and 65% of ultra-runners throughout MSUM and 24h, respectively. GIS during MSUM resulted in reduced total daily, pre-stage, during, and post-stage energy ( $p = 0.04$ ) and macronutrient

intakes ( $p = 0.02$ ); whereas GIS during 24h did not influence nutritional variables. Throughout MSUM and 24h, 76% and 12% of ultra-runners required medical intervention for DI, respectively. DI during MSUM resulted in reduced total daily energy intake ( $p = 0.05$ ), carbohydrate ( $p = 0.045$ ) and fluid ( $p = 0.016$ ) intake during running, and protein intake post-stage ( $p = 0.045$ ). DI throughout 24h was low, thus comparative analyses was not viable.

**Conclusions:** High rates of GIS were reported in both events; however GIS only affected nutritional intake during MSUM, likely attributed to exertional-heat stress. DI presence and severity reduce nutritional intake during running and recovery in MSUM, suggesting DI prevention strategies are warranted.

**Funding source(s):** N/A.

#### GLOBAL GENE TRANSCRIPT PROFILING REVEALS LACTOFERRIN INTERVENTION INFLUENCES NEURAL DEVELOPMENT AND COGNITION

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**Background/Aims:** To test the hypothesis that lactoferrin (Lf) may induce gene expression profiling and function to improve neurodevelopment and cognition in postnatal piglets, an animal model for human infants.

**Methods:** Three-day-old male piglets were randomly allocated to two groups. Group 1 were fed milk replacer supplemented with Lf at 0.6 g/L ( $n = 17$ ) and Group 2, 0.06 g/L ( $n = 16$ ; control). RNA was isolated from the hippocampus of 10 piglets/group and subjected to transcript profiling using a Porcine Affymetrix GeneChips representing 20,201 genes from *Sus scrofa*. A TaqMan<sup>®</sup> Gene expression assay based real-time PCR was used to validate the microarray findings. Results were analysed using Partek Genomics Suite 6.5 software and Ingenuity System (Ingenuity<sup>®</sup> System, Redwood City, CA, USA).

**Results:** A total of 1,187 genes were differentially expressed between the control and Lf groups, based on our filter criteria (fold change: 1.15 and  $p < 0.05$ ). A positive global effect of Lf on neurodevelopment and cognition was observed, as evidenced by the modulation of a wide range of neuronal processes including an increase in cellular protrusions, microtubule dynamics, formation and organization of neurite outgrowth, cytoskeleton formation, and a decrease in anxiety. TaqMan<sup>®</sup> gene expression assays which showed that Lf up-regulated the brain-derived neurotrophic factor (BDNF) gene and signalling pathway known to influence early neurodevelopment and cognition in postnatal mammals.

**Conclusions:** Lf supplementation up-regulated several canonical signalling pathways associated with neurodevelopment and cognition, the principal one being BDNF.

**Funding source(s):** Medical school of Xiamen University, China, Nestle Research Centre-Beijing.

#### BITTER TASTE PHENOTYPE BETTER PREDICTS FOLATE STATUS THAN TAS2R38 BITTER RECEPTOR GENOTYPE ALONE IN A COLONOSCOPY COHORT

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**Background/Aims:** TAS2R38 polymorphisms influence bitter taste perception. Those sensitive to bitter tastes may consume less healthy vegetables, resulting in a higher risk of diet-related disease. We assessed the influence of TAS2R38 genotype and bitter taste phenotype on folate intake and blood levels, as a marker of healthy vegetable consumption, and if this influenced risk of adenomatous polyps (AP).

**Methods:** Blood was collected from colonoscopy patients ( $n = 206$ ). Polymorphisms in the TAS2R38 gene were measured (Restriction fragment length polymorphism-PCR/sequencing; A49P; rs173598, V262A: rs1726866,