

classified according to quartiles of DF intake.

Results: The majority of adults consumed DF (97%) and median serves consumed was 3.9/day. Half (50%) of all REO contained a DF. The REO with the most DF consumers were 'lunch' and 'dinner'; which together contributed 45% of total DF energy intake. Cakes, muffins, scones, cake-type desserts ('cakes') contributed the most DF energy (8.4%). Top contributor to DF energy for males was beer (10.9%) and for females was 'cakes' (10.1%). Pastries provided the highest DF energy contribution among lowest SES; and wine among highest SES. DF contributed 49.4% of total sugar and 42.2% of total saturated fat. The top quartile of %en from DF consumed an average of 10 ± 4.5 DF serves, had a higher prevalence of males, younger adults, low SES and higher mean waist circumference but not higher BMI.

Conclusions: A focus on decreasing consumption of the largest contributors to DF may be useful to decrease saturated fat and sugar intakes, especially during lunch and dinner and amongst the highest consumers.

Funding source(s): Nestlé Australia Ltd.

CONCURRENT SESSION 8: VITAMINS.

MUSCLE VITAMIN E AND RETAIL COLOUR OF MEAT FROM LAMBS FED LUCERNE OR GRAIN-BASED DIETS AT TWO ANTIOXIDANT LEVELS

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Background/Aims: Muscle antioxidant status and meat colour can be affected by nutritional background. This study aimed to compare the effect of 3 different diets on muscle vitamin E (vitE) concentration and the retail colour of meat given the importance of colour to consumers.

Methods: Lambs ($n = 41$) were fed for 8 weeks either a lucerne-based diet (37 mg/kg of vitE) or a grain-based control (CON; 42 mg/kg of vitE) or supranutritional vitE (SUP; 285 mg/kg of vitE) diet. Loin muscle samples were assessed for vitE and retail colour. Data was analysed using the REML and MANOVA procedures.

Results: Lambs fed the SUP diet had a higher muscle vitE concentration (5.1 mg/100 g meat; $p < 0.001$, SED = 0.44) compared to CON (2.5 mg) or LUC (3.4 mg). A MANOVA of the 3 dimensional colour attributes L^* , a^* and b^* found that meat from the lambs fed LUC was redder (higher a^*) and lighter (higher L^*) than meat from lambs fed CON or SUP ($p = 0.016$). After 4 days of retail display redness (a^*) of the loin for the LUC fed lambs tended to be higher ($p = 0.08$) than loin from the other groups.

Conclusions: Although the SUP group had greater muscle vitE status, the lucerne-based diet maintained retail colour of meat better than the vitE supplemented grain-based diet. It seems bioavailability of vitE or other antioxidants was greater for lambs fed the lucerne-based diet.

Funding source(s): Australian Meat Processor Corporation and Victorian Government (Department of Economic Development, Jobs, Transport and Resources; DEDJTR).

A VITAMIN D INTERVENTION IN PRESCHOOLERS WITH VIRAL-INDUCED ASTHMA: A PILOT RANDOMISED CONTROLLED TRIAL (DIVA)

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Background/Aims: Trials in school-aged children suggest vitamin D supplementation reduces asthma exacerbations. We aimed to examine whether vitamin-D₃ (100,000 IU) raises serum 25-hydroxy-vitamin D (25OHD) and ascertain the feasibility for a large-scale intervention in preschoolers.

Methods: In a 6-month, double-blind, randomised, placebo-controlled, pilot trial, children aged 1-5 years with viral-induced asthma were allocated to receive orally 100,000 IU vitamin-D₃ (intervention) or identical

placebo (control), plus 400IU vitamin-D₃ daily for six months. Serum 25OHD was measured at baseline, 10 days, 3 and 6 months. Outcomes included the group difference in 25OHD change from baseline (Δ 25OHD) at 3 months (primary); the proportion of children with 25OHD ≥ 75 nmol/L at 3 months (secondary); and health event rates.

Results: Twenty-two children were randomised (intervention: 11; control: 11). At 3 months, the group difference in Δ 25OHD (7.2 nmol/L; 95%CI: -13.7, 28.1) was not significant; yet, 100% versus 54.5% (intervention versus control) had serum vitamin D ≥ 75 nmol/L. Overall, there was a significant group, time, and group*time effect on 25OHD, in favour of the intervention, with a significant group difference in Δ 25OHD at 10days (110.3 nmol/L; 95% CI: 64.0, 156.6). Group rates for oral corticosteroids were 0.82 and 1.18/child (intervention versus control; Rate Ratio = 0.68; 95%CI: 0.30, 1.62).

Conclusions: Following 100,000 IU vitamin-D₃, all children reached a serum vitamin D level ≥ 75 nmol/L, compared with half those who received placebo. Daily supplementation, sun exposure and insufficient power may explain the absence of a significant 3-month group difference in Δ 25OHD. Oral corticosteroid rates suggest an effect size concordant with previous trials.

Funding source(s): Thrasher Research Fund.

SERUM 25-HYDROXYVITAMIN D CONCENTRATIONS ARE INVERSELY ASSOCIATED WITH INSULIN RESISTANCE IN ADOLESCENTS AND YOUNG ADULTS

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Background/Aims: Vitamin D receptors are strongly expressed in pancreatic beta-cells and the active form of vitamin D may protect against insulin resistance in peripheral tissues. However, the evidence associating serum 25-hydroxyvitamin D [25(OH)D] concentrations and insulin resistance is inconsistent and most observational studies have been cross-sectional in design. We examined the prospective associations between serum 25(OH)D concentrations and insulin resistance from adolescence to young adulthood.

Methods: Serum 25(OH)D concentrations and homeostatic model assessment for insulin resistance (HOMA-IR) were measured at the 17 ($n = 1015$) and 20 year ($n = 1118$) follow-ups of the West Australian Pregnancy Cohort (Raine) Study. HOMA-IR was not normally distributed, so a log transformation was applied. Hierarchical linear mixed models with maximum likelihood estimation were used to investigate associations between serum 25(OH)D concentrations and ln HOMA-IR, with consideration given to potential confounders, including sex, race, BMI, physical activity, family income, smoking and alcohol intake.

Results: In a univariate model, serum 25(OH)D concentrations were inversely associated with ln HOMA-IR (Coefficient = -0.003; 95%CI -0.005, -0.002; $p < 0.001$) and the inverse association was maintained after adjusting for BMI (Coefficient = -0.002; 95%CI -0.003, -0.001; $p < 0.001$). The model shows that a one standard deviation increase (approximately 30 nmol/L) in serum 25(OH)D concentrations associated with a 6% decrease in HOMA-IR.

Conclusions: We found that serum 25(OH)D concentrations were inversely associated with insulin resistance. Well-designed randomised controlled trials may be warranted in order to determine any potential beneficial effect of vitamin D supplementation on insulin resistance in adolescents and young adults.

Funding source(s): NHMRC.

A NOVEL MODELLING APPROACH TO DETERMINE THE EFFECT OF VOLUNTARY VITAMIN D FORTIFICATION OF BREAKFAST CEREALS

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Background/Aims: This study uses a novel modelling approach based on serum 25-hydroxyvitamin D (25OHD) to estimate the effect of voluntary

vitamin D fortification of breakfast cereals (BC) on vitamin D status of Australian and New Zealand (ANZ) populations.

Methods: Vitamin D intakes from BC containing 5 µg vitamin D/serve were calculated using ANZ nutrition surveys under several modelling scenarios. Increments in intakes were converted to increments in serum 25OHD using a reported dose-response relationship and then added to population distributions of serum 25OHD from national surveys. The proportion of the population with low and high serum 25OHD was calculated before and after fortification for different BC consumption levels.

Results: Consumption of vitamin D-fortified BC under all scenarios predicted annual mean serum 25OHD concentrations which were within the physiological range. Currently, about 13% of Australians and 21% of New Zealanders have low vitamin D status using 40 nM as a serum 25OHD cut-point. Consumption of vitamin D-fortified BC would decrease this prevalence to about 1.5%. Currently, about 1.4% of the population have high serum 25OHD using a conservative 25OHD cut-point (125 nM), and this prevalence increased to 5.5–7.5% for the high BC consumers, or “worst-case” scenario.

Conclusions: This study showed that BC fortification at the modelled vitamin D amounts would potentially increase the vitamin D status of individuals whose status is inadequate. Since usual BC consumption would be much less than the modelled worst-case scenario, consumers are unlikely to be at risk of exceeding safe vitamin D intakes.

Funding source(s): N/A.

VITAMIN B₁₂ STATUS IS LOWER IN ORAL CONTRACEPTIVE PILL USERS COMPARED TO NON-USERS

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Background/Aims: Vitamin B₁₂ deficiency has potentially serious lifelong consequences. The aim of this study is to explore the associations between markers of vitamin B₁₂ status and other biochemical, dietary and physical measures.

Methods: Three data sets composed of young omnivore women ($n = 65$; age 24.5 ± 4.4 y; mean \pm SD), randomly selected young women ($n = 305$; age 22.5 ± 3.9 y) and elderly women ($n = 44$; age 80.5 ± 7.6 y) were examined. Associations between vitamin B₁₂ biomarkers and other selected biomarkers of nutritional status (i.e. serum folate, erythrocyte folate), lifestyle factors such as; dietary intake, smoking, alcohol intake, oral contraceptive pill (OCP) use (in the non-elderly groups), and other factors such as BMI and age were examined using mixed effects regression, accounting for study clusters.

Results: Serum vitamin B₁₂ concentration (pmol/L) was related positively to both serum folate (nmol/L; $\beta = 0.018$ 95%CI: 0.009–0.026, $p < 0.001$) and erythrocyte folate (nmol/L; $\beta = 0.456$ 95%CI: 0.164–0.747, $p < 0.01$). Younger women who used the OCP had serum vitamin B₁₂ concentrations that were 72.3 (SE = 12.4) pmol/L lower than non-users ($p < 0.001$). Vitamin B₁₂ was marginally associated with the intakes of both protein ($p < 0.05$) and alcohol ($p < 0.001$). Serum vitamin B₁₂ concentration was not related to age, smoking status or iron status.

Conclusions: The association between vitamin B₁₂ and folate status may be indicative of a higher diet quality, but requires further investigation. With vitamin B₁₂ deficiency being linked with increased risk of neural tube defect, the use of the OCP may pose an increased risk in women of reproductive age.

Funding source(s): N/A.

CONCURRENT SESSION 9: LIFECYCLE. DIETARY MODIFICATIONS OF THE MATERNAL DIET AMONG BREAST-FEEDING MOTHERS

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Background/Aims: Breastfeeding mothers tend to modify their habitual

diet and avoid certain foods. The reasons for this are not fully understood. The aim of this survey was to explore the motives and common dietary practices among breastfeeding mothers and if nutritional intake is compromised.

Methods: An on-line exploratory survey, invited women who had breastfed to participate.

Results: Of the 1,293 respondents, 98% completed the survey and 77% mothers modified their usual diet. The most common reasons were 'baby was unsettled' (31%), 'baby had lots of wind/gas' (24%), 'baby had reflux' (17%) and 'baby had colic' (11%). The most common modifications were avoidance of alcohol (79%), coffee (44%), cow's milk (24%), milk chocolate (22%), chilli (22%) and cabbage and onion (each 20%). Information was sourced from the internet (44%), maternal and child health nurses (40%), the Australian Breastfeeding Association (34%). Sourcing information from paediatricians was less common (10%) and 89% of respondents had never seen a dietitian. Thirty-three percent removed dairy, but did not replace it with other calcium-rich foods nor did they take a calcium supplement. Thirty-two percent that modified their diet did not take a suggested breastfeeding multi-vitamin for when the nutrition guidelines are difficult to meet.

Conclusions: Dietary modification among breastfeeding mothers is common practice. The most reported reason was due to an 'unsettled baby'. The majority of information is sourced from the internet and not from experts in nutrition suggesting this group may be at risk of nutritional inadequacies.

Funding source(s): N/A.

ASSOCIATIONS BETWEEN DIETARY INTAKE, DIET QUALITY AND DEPRESSIVE SYMPTOMS IN FIRST-TIME MOTHERS

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Background/Aims: Diet may be associated with depressive symptoms. The objective of this study was to determine the association between diet and depressive symptoms in first-time mothers.

Methods: Cross-sectional, baseline data (3 months postpartum) were obtained from the Melbourne INFANT (Infant Feeding, Activity and Nutrition Trial) Extend Program. Participants included first-time mothers aged 19–45 years from Victoria, Australia ($n = 457$). Diet over the past year was assessed via a validated, self-administered 137-item food frequency questionnaire. Adherence to the 2013 Australian Dietary Guidelines was assessed using a previously developed dietary guideline index (DGI) as a measure of diet quality. Depressive symptoms were determined using the Centre for Epidemiologic Studies Depression Scale (CES-D 10). Relationships between fruit and vegetable intake (serves per day), frequency of fish intake and diet quality and depressive symptoms were investigated using linear regression adjusted for covariates (age, socioeconomic position, smoking status, physical activity, television viewing time, sleep quality, and BMI).

Results: Higher diet quality, as indicated by a higher score on the DGI, was associated with lower depressive symptoms after adjusting for covariates ($\beta = -0.034$; 95% CI = -0.056, -0.012). There were no significant associations between fruit, vegetable or fish intake and depressive symptoms.

Conclusions: Increased adherence to the Australian Dietary Guidelines was associated with lower depressive symptoms among Australian first-time mothers. These findings may be used to inform future public health nutrition initiatives among this target group.

Funding source(s): World Cancer Research Fund.

ANTENATAL BREASTFEEDING CONFIDENCE AND BREASTFEEDING DURATION IN OBESE AND NON-OBESE PRIMIPAROUS AUSTRALIAN WOMEN

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Background/Aims: The aim of this study is to compare breastfeeding