= 0.0066, $p = 0.034$, 25 nmol/L for FRT, $\beta_{low} = 0.684$ (0.075, 1.292); $\Delta\beta = 0.697$, $p = 0.027$ and LMS, $\beta_{low} = 1.703$ (0.241, 3.165); $\Delta\beta = 1.802$, $p = 0.020$, and 60 nmol/L for ST, $\beta_{low} = 0.030$ (-0.001, 0.061); $\Delta\beta = 0.051$, $p = 0.038$.
Conclusions: In middle-aged women, the point at which relationships between 25(OH)D and musculoskeletal outcomes change varies for different outcomes. The current cut-off of 50 nmol/L appears too high for some outcomes but reasonable overall to optimise bone and balance in this population.
Funding source(s): NHMRC and RACGP / Osteoporosis Australia Bone Health Research Grant.

GLYCATED ALBUMIN: SAMPLE STABILITY OF AN EMERGING GLYCAEMIC CONTROL BIOMARKER

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Background/Aims: Glycated albumin (GA) is an emerging biomarker of glycaemic control reflecting glycaemia in the previous two weeks. It is the ratio of glycated to total albumin expressed as a percentage. It is stable to day-to-day fluctuations in glycaemia; independent of plasma volume or albumin concentration; and unaffected by haemodialysis or haemoglobinopathies. Used clinically in India and China, GA correlates with HbA1c and fasting glucose. Validation of sample stability is required.
Methods: Three experiments were undertaken using plasma samples of people with type 2 diabetes. 1. Short-term stability of 15 samples undergoing freeze-thaw cycles. 2. Short-term stability of 15 samples stored at 4 °C for up to two days. 3. Long-term stability of 25 samples assayed 5 years ago and subsequently stored at -80 °C.
Results: The mean GA of fresh samples and those undergoing 1, 2, 5 and 10 freeze-thaw cycles were 18.15, 18.14, 18.08, 18.14, and 18.19%, respectively – values did not differ from baseline ($p = 0.86$). The mean GA of thawed samples stored at 4 °C for 12, 24 and 48 h were 17.36, 17.33, 17.37 and 17.61, respectively – the 48 h sample differed from baseline ($p = 0.009$). The mean GA of samples stored at -80 °C for 5 years (34.99%) was double that of the fresh samples (18.89%).
Conclusions: GA appears stable to multiple short-term freeze thaw cycles and to storage at 4 °C for up to 24 h. Long-term storage resulted in an appreciable increase in GA. Further work is required to characterise the stability of GA under various storage conditions.
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SELENIUM OR VITAMIN E MITIGATES HYPERTHERMIA IN GROWING PIGS

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Background/Aims: An increasing prevalence of heat waves presents the challenge of managing hyperthermia, particularly in intensively farmed animals. Therefore the aim of this experiment was to quantify protective effects of anti-oxidants selenium (Se) or vitamin E (VE) during hyperthermia in growing pigs.
Methods: Thirty-six gilts (Large White × Landrace, 28 ± 4 kg) were fed control (0.24 ppm Se, 17 IU/kg VE), Se (1.0 ppm Se yeast, 17 IU/kg VE), or VE (0.24 ppm Se, 200 IU/kg VE) 80% restricted for 14 days, then exposed to thermoneutral (TN) vs. cyclic hyperthermia (HT) for seven days (20 °C vs. 35 °C 0900-1700h/28 °C). Hyperthermia was assessed by skin and rectal temperature (ST and RT), respiration rate (RR), heart rate (HR) and blood bicarbonate. Data were analysed using restricted maximum likelihood for the effects and interactions of diet, temperature, time.
Results: As expected with restricted feeding, feed intake was not affected, so effects could be ascribed to HT or antioxidants rather than to differences in feed intake. Despite similar feed intakes, HT increased body weight ($p < 0.001$). HT increased ST and RT ($p < 0.001$), and both were mitigated by Se ($p = 0.019$ and < 0.001). RR increased during HT ($p < 0.001$) which was ameliorated by Se, but elevated with VE ($p = 0.006$). HT reduced HR at 1600h, which was mitigated by Se and VE ($p < 0.001$). Also, VE protected reductions in blood bicarbonate during HT ($p = 0.016$).
Conclusions: Short term Se or VE supplementation ameliorated the effects of hyperthermia in growing pigs.
Funding source(s): Australian Pork Limited, Department of Agriculture, Fisheries and Forestry.

META-ANALYSIS OF RCTS REPORTING ON THE CORONARY HEART DISEASE RISK OF CALCIUM SUPPLEMENTATION WITH OR WITHOUT VITAMIN D

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Background/Aims: Recent single centre papers suggest that calcium supplementation increases the risk of coronary heart disease. These risks were re-evaluated by a consortium who undertook a meta-analysis of all randomised controlled trials of calcium supplements with or without vitamin D for coronary heart disease events and all-cause mortality.
Methods: The Cochrane Central Register of Controlled Trials, MEDLINE, and EMBASE databases were searched from January 1966 to May 2013 for randomised controlled trials of calcium supplementation with or without vitamin D in women aged over 50 years with event data from hospitalisation verified by clinical review or hospital record and/or death certificate data.
Results: Of 661 potentially eligible studies, 18 met the inclusion criteria, reporting data from 63,564 participants with 3,390 coronary heart disease events and 4,157 deaths. Coronary heart disease hospitalisation or death events pooled RR for calcium of 1.02 (95% CI: 0.96, 1.09; $p = 0.51$). All-cause mortality data (17 trials) had an RR for calcium of 0.96 (95%CI: 0.91, 1.02; $p = 0.18$). Heterogeneity among the trials was low for both primary outcomes ($I^2 = 0\%$). Secondary outcomes RR for myocardial infarction, chronic coronary heart disease and angina pectoris and acute coronary syndrome were 1.08 (95%CI: 0.92, 1.26; $p = 0.33$), 0.92 (95%CI: 0.73, 1.15; $p = 0.46$) and 1.09 (95%CI: 0.95, 1.24; $p = 0.22$) respectively.
Conclusions: Calcium supplementation with or without vitamin D does not increase coronary heart disease or all-cause mortality risk in women consuming calcium to prevent fractures.
Funding source(s): Raine Medical Research Foundation Priming Grant.

SUITABILITY OF VITAMIN D SUPPLEMENTS TO IMPROVE PSYCHOLOGICAL WELLBEING OVER WINTER

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Background/Aims: Vitamin D has been associated with psychological wellbeing in previous studies, for example depression, anxiety, and seasonal affective disorder. We tested whether vitamin D supplementation over winter is beneficial for psychological wellbeing in healthy women.
Methods: One hundred and fifty two healthy women (18-40 years of age) in Dunedin, New Zealand (S46°) have been randomly assigned to receive six monthly doses of 50,000 IU of oral vitamin D_3 or placebo. They completed the Centre for Epidemiologic Studies Depression Scale (CES-D), the anxiety subscale of the Hospital Anxiety and Depression Scale (HADS), and the Flourishing Scale (FS) every month. Additionally, they reported on positive and negative moods every two months for three consecutive days. Participants provided a blood sample for 25-hydroxyvitamin D analysis at the beginning and at the end of the study. Differences for each wellbeing measure between the groups were analysed using ANCOVA, controlling for confounders and baseline values. Mixed model regression was used to test the treatment by time interaction effect.