

guidelines. Using 24-hr recall, the 2007 National Child Nutrition and Physical Activity Survey found that children 9–13y consumed on average 19.2 mg caffeine per day. However, little is known about caffeine consumption and its impact on sleep in children. This study assessed caffeine consumption and sleep in school aged children.

Methods: Children aged 8–12 y (10.7 ± 1.3 y, 49% male) were recruited through South Australian schools and the community for a retrospective, cross sectional study. Demographics, caffeine intake (a Food Frequency Questionnaire), and daytime sleepiness (Paediatric Daytime Sleepiness Scale) were obtained via child and parent report.

Results: Data from 230 children demonstrated daily caffeine intake ranged between 0–64.1 mg (7.8 ± 11.7 mg). Gender did not impact caffeine intake ($p = 0.97$). 74% of 8 year olds consumed caffeine (8.0 ± 10.5 mg), 78% of 9 years olds (8.3 ± 9.6 mg), 72% of 10 year olds (10.1 ± 13.5 mg), 83% of 11 year olds (9.7 ± 13.4 mg) and 87% of 12 year olds (12.6 ± 13.2 mg). Twenty-five percent ($n = 58$) of the sample consumed between 11.1mg (~Standard chocolate bar) and 64.1 mg (~one small latte) of caffeine/day. Daily caffeine consumption had a significant relationship with age ($r = 0.14$, $p = 0.03$) and daytime sleepiness ($r = 0.14$, $p = 0.03$). Children who were in the top 25% of caffeine consumption had significantly higher daytime sleepiness compared to the remaining 75% of the sample ($p = 0.05$).

Conclusions: These findings show that majority of children aged 8–12 y consume caffeine. The study also shows a significant relationship between caffeine intake and daytime sleepiness in children, with greater caffeine consumption associated with more daytime sleepiness.

Funding source(s): N/A.

THE METABOLISM OF DIETARY ARACHIDONIC AND EICOSAPENTAENOIC ACIDS IN ATLANTIC SALMON AS AFFECTED BY ENVIRONMENTAL TEMPERATURE

G. Turchini, F. Norambuena. Deakin University, VIC, Australia
E-mail address: giovanni.turchini@deakin.edu.au (G. Turchini)

Background/Aims: Aquaculture is encountering sub-optimal conditions due to changing environments. Simultaneously, shortages in marine oils are resulting in a reduction of dietary long chain-PUFA. The effects of water temperature and dietary arachidonic acid (ARA):EPA ratios on the regulation of fatty acid (FA) metabolism in salmon were investigated.

Methods: Atlantic salmon kept at optimal (10°C) and elevated (20°C) temperature were fed one of three experimental diets. The diets had identical FA composition with the exception of the EPA:ARA ratio, varying from 2.4 to 0.1. The FA metabolism was assessed via the whole-body-fatty-acid-method and selected genes expression was quantified by qPCR.

Results: The higher temperature showed an increase in the total FA β -oxidation (from 1,645.3 to 814.5 nmol/g/day at 20°C or 10°C , respectively). At both temperatures, the β -oxidation of SFA and MUFA was lower in group with highest dietary EPA supply. The higher temperature showed a reduction in the activity and gene transcription of FA desaturases (*D6fad* and *D5fad*) and elongase *Elovl2*, whereas elongase *Elovl5* was not affected. The metabolic fate of ARA was affected by temperature and dietary treatment. Whereas, in fish held at 20°C , the metabolic fate of dietary EPA was identical for all three treatments.

Conclusions: Temperature plays remarkable effects on EPA and ARA metabolism. Increased dietary ARA supply, relative to EPA, is beneficial in fish held at elevated water temperatures. These findings contribute towards the formulation of novel functional aquaculture diets.

Funding source(s): ARC Discovery Project.

CONCURRENT SESSION 6: LIPIDS.

ROSUVASTATIN, LYCOPENE AND OMEGA-3 FATTY ACIDS: A POTENTIAL TREATMENT FOR SYSTEMIC INFLAMMATION IN COPD

E.J. Williams^{1,2}, K.J. Baines^{1,2}, J.M. Smart^{1,2}, P.G. Gibson^{1,2}, L.G. Wood^{1,2}. ¹Centre for Asthma and Respiratory Diseases, Hunter Medical Research Institute, Newcastle, NSW, Australia; ²University of Newcastle,

NSW, Australia

E-mail address: evan.j.williams@uon.edu.au (E.J. Williams)

Background/Aims: Chronic Obstructive Pulmonary Disease (COPD) is characterized by lung and airway inflammation, resulting in loss of lung function. Systemic inflammation is a feature of COPD contributing to many associated co-morbidities. Statins, omega-3 fatty acids (DHA and EPA) and lycopene have been shown to decrease systemic inflammation; this combination has not been studied previously. The aim of this study was to identify changes in systemic and airway inflammation induced by statins and/or DHA, EPA and lycopene in COPD.

Methods: COPD patients ($n = 11$) received rosuvastatin (20 mg/day) for 4 weeks, then a combination of rosuvastatin (20 mg/day), DHA and EPA (1.5 g/day) and lycocomato (45 mg/day) for 8 weeks. Blood and sputum were collected and lung function measured by spirometry at baseline, week 4 and 12. Plasma C-reactive protein (CRP) and IL-6 were measured using ELISA; peripheral blood gene expression was measured using nCounter™ GX Human Inflammation Kit 2.

Results: Following interventions, clinical characteristics were unchanged. Plasma IL-6 and CRP were unchanged by intervention, sputum neutrophils were increased and macrophages decreased by rosuvastatin ($p = 0.020$ and $p = 0.015$; respectively). Rosuvastatin increased *LTB4R* and decreased *CXCL10* and *AGER* blood gene expression. When lycopene and omega-3 fatty acids were added, *LTB4R* decreased and *CXCL10* decreased to basal levels, whilst combined intervention increased *ALOX15* blood gene expression.

Conclusions: This study shows rosuvastatin, omega-3 fatty acids and lycopene may have anti-inflammatory effects systemically, but rosuvastatin may increase airway neutrophils, which would be undesirable in COPD, warranting further investigation.

Funding source(s): NHMRC, Centre for Clinical Research Excellence.

POLYUNSATURATED FATTY ACID FOOD FREQUENCY QUESTIONNAIRE VALIDATION IN PEOPLE WITH END STAGE RENAL DISEASE ON DIALYSIS

L. Roach¹, K. Russell², K. Lambert³, J. Holt³, B. Meyer¹. ¹School of Medicine, University of Wollongong, NSW, Australia; ²Charles Sturt University, Wagga Wagga, NSW, Australia; ³Renal Unit, Wollongong Hospital, NSW, Australia
E-mail address: lar966@uowmail.edu.au (L. Roach)

Background/Aims: People on dialysis have a high risk of cardiovascular disease. PUFA in particular omega-3 fatty acids are of interest in this population due to their cardioprotective properties. The PUFA food frequency questionnaire (FFQ) is a validated tool to measure PUFA intake in healthy populations, but has yet to be validated in a diseased population. The aim of this study is to validate the PUFA FFQ using the method of triads in a population of end stage renal failure patients on dialysis.

Methods: Participants ($n = 32$) completed the PUFA FFQ and multiple 24 hour recalls, non-fasting blood samples were taken ($n = 29$) for erythrocyte fatty acid analysis. The triangular relationship between the PUFA FFQ, 24 hour recalls and the biomarker were assessed using the method of triads, which calculated validity coefficients for PUFA. Agreement between the two dietary methods were also assessed using Bland-Altman plots and classification by quintiles.

Results: The PUFA FFQ was a valid measure of all PUFA except for docosapentaenoic acid (DPA) and arachidonic acid (AA). Strong validity coefficients were found for long chain omega-3 fatty acids eicosapentaenoic acid (EPA) and docosahexaenoic acid (DHA) of 0.914 (95% CI: 0.665, 0.997) and 0.889 (95% CI: 0.706, 0.994) respectively. Bland Altman plots showed a good level of agreement between the PUFA FFQ and the 24 hour recalls as approximately 95% of observations were between the levels of agreement.

Conclusions: The PUFA FFQ is a valid tool for assessing PUFA intake in a population of dialysis patients.

Funding source(s): N/A.

FAT TYPE IN PHYTOSTEROL SPREADS INFLUENCE THEIR CHOLESTEROL-LOWERING POTENTIAL: A SYSTEMATIC REVIEW AND META-ANALYSIS OF RCTS