

Methods: A literature search was conducted using CINAHL, MEDLINE, and Embase. Clinical, in vitro and animal studies both within the chemotherapy context and in other relevant fields were included.

Results: Our literature search identified twenty-two studies that had investigated ginger for properties relevant to CINV. The results of these studies suggest that ginger may interact with several pathways that are directly implicated in CINV including 5-HT₃ and substance P receptor antagonism, and modulation of cellular redox. In addition, while not directly involved in the generation of CINV, ginger was found to act on multiple pathways that may exacerbate symptoms. These properties include anti-inflammatory properties; and the modulation of vasopressin release, gastrointestinal motility, and gastric emptying rate.

Conclusions: The evidence presented in this review indicates that ginger possesses multiple properties that could be beneficial in reducing chemotherapy-induced nausea and vomiting. However, due to existing limitations within the literature, further studies are required before firm recommendations regarding its usage in the oncology setting can be made.

Funding source(s): N/A.

POLYPHENOL COMPOSITION OF AUSTRALIAN APPLE VARIETIES: EFFECT OF VARIETY AND HARVEST YEAR

C.P. Bondonno¹, K.D. Croft¹, M.J. Considine^{2,3}, I.B. Puddey¹, E. Swinney⁴, S.R. Jacob³, K. Lacey³, A. Muburak⁵, J.M. Hodgson¹. ¹School of Medicine and Pharmacology, University of Western Australia, Australia; ²School of Plant Biology, University of Western Australia, Australia; ³Department of Agriculture and Food WA, Australia; ⁴Chemistry Centre, Perth, WA, Australia; ⁵Faculty of Agrotechnology and Food Science, Universiti Malaysia, Terengganu, Malaysia
E-mail: catherine.bondonno@uwa.edu.au (C.P. Bondonno)

Background/Aims: Polyphenols have been highlighted as a potential candidate for reduction in risk of chronic disease observed with a diet high in fruit and vegetables. Apples, rich in polyphenols and widely consumed, are a major contributor to total polyphenol intake. Breeding and selecting for high polyphenol apples, therefore, could translate into a natural and low cost method of improving population health. The aim of this study was to examine the genetic and seasonal variation of four polyphenols with potential health benefits in Australian apple identities.

Methods: Total quercetin glycosides, (-)-epicatechin, chlorogenic acid and phloridzin levels were quantified by HPLC in skin and flesh of 21 Australian apple identities (nine breeding accessions; 12 commercial varieties) harvested between December 2011 and February 2012. These polyphenols were again assessed in a subset of seven Australian apple identities harvested between December 2012 and February 2013.

Results: Quercetin glycosides (mean, 8.8 mg/100g fresh weight; range, 0.9 - 15.5 mg/100 g) were the predominant polyphenol and were concentrated in the skin. Chlorogenic acid (mean, 3.1 mg/100 g fresh weight; range, 0-10.5 mg/100 g) was found predominantly in the flesh. (-)-epicatechin (mean, 2.1 mg/100 g fresh weight; range, 0.3-8 mg/100 g) and phloridzin (mean, 0.5 mg/100 g fresh weight; range, 0.2-1.4 mg/100 g) also concentrated in the skin were found at lower concentrations. Polyphenol content and concentration decreased in 2013 compared to 2012.

Conclusions: Several apple varieties (with skin) had very high polyphenol content. There was, however, large genetic influence on polyphenol content, while seasonal variation was less marked.

Funding source(s): ARC and Australian National Apple Breeding Program.

EFFECTS OF CEREAL SOLUBLE DIETARY FIBRES ON LIPOLYSIS OF P-NITROPHENOL LAURATE, A MODEL LIPID

H. Zhai¹, P. Gunness¹, M.J. Gidley¹. ¹Centre for Nutrition and Food Sciences, Centre of Excellence in Plant Cell Walls, The University of Queensland, QLD, Australia
E-mail: h.zhai@uq.edu.au (H. Zhai)

Background/Aims: The aim of this study was to investigate the effects of cereal soluble dietary fibres (SDFs), β -glucans (β G) from oat and barley, on the lipolysis of p-nitrophenol laurate (pNPL), a model lipid.

Methods: The pNPL emulsions were prepared with or without β G at different concentrations (0.1%, 1.0% and 2.0% w/w). A microplate reader

was used to determine the rate of lipolysis and the particle size and distribution of the pNPL droplets was measured with a Zeta-sizer. An AR-G2 rheometer was used to determine the viscosity of the emulsions.

Results: The rate of lipolysis decreases in the presence of β G. The average particle size of the pNPL droplets increases (470 nm average) in the presence of β G compared to the emulsions without β G (8.47 nm average). Emulsions viscosities increase with β G (2.14×10^{-3} Pa·s vs. 1.25×10^{-3} Pa·s in control).

Conclusions: Oat and barley β G decrease the rate of pNPL lipolysis. The viscous SDFs might hinder the formation of the emulsion and/or prevent the pNPL from binding to the active site of lipase. These results are consistent with the suggestion that cereal SDFs added to a diet slow down the rate of lipid digestion and absorption.

Funding source(s): ARC.

Poster session 5: micronutrients and antioxidants

THE ACUTE EFFECT OF FLAVONOID-RICH APPLES AND NITRATE-RICH SPINACH ON COGNITIVE PERFORMANCE AND MOOD IN HEALTHY MEN AND WOMEN

C.P. Bondonno¹, L.A. Downey², K.D. Croft¹, A. Scholey², C. Stough², N.C. Ward¹, M.J. Considine³, I.B. Puddey¹, E. Swinney⁴, A. Muburak⁵, J.M. Hodgson¹. ¹School of Medicine and Pharmacology, UWA, Australia; ²Centre for Human Psychopharmacology, Swinburne University, Australia; ³School of Plant Biology, UWA and Department of Agriculture and Food WA, Australia; ⁴Chemistry Centre, Perth, WA, Australia; ⁵Faculty of Agrotechnology and Food Science, Universiti Malaysia, Terengganu, Australia
E-mail: catherine.bondonno@uwa.edu.au (C.P. Bondonno)

Background/Aims: Flavonoids and nitrate in a fruit and vegetable diet may be protective against cardiovascular disease and cognitive decline through effects on nitric oxide (NO) status. The circulating NO pool is increased via distinct pathways by dietary flavonoids and nitrate. Our aim was to investigate the acute effects of apples, rich in flavonoids, and spinach, rich in nitrate, independently and in combination on NO status, cognitive function and mood.

Methods: In a randomized, controlled, cross-over trial with thirty healthy men and women, the acute effects of four energy-matched treatments (control, apple, spinach and apple+spinach) were compared. Endpoints included plasma NO status (determined by measuring S-nitrosothiols+other nitroso species, RXNO); nitrate and nitrite in plasma, saliva and urine; and cognitive function (determined using the Cognitive Drug Research computerized cognitive assessment battery) and mood.

Results: Relative to control, all treatments resulted in higher plasma RXNO. A significant increase in plasma nitrate and nitrite, salivary nitrate and nitrite as well as urinary nitrate and nitrite was observed with spinach and apple+spinach compared to control. No significant effect was observed on cognitive function or mood.

Conclusions: Flavonoid-rich apples and nitrate-rich spinach augmented NO status acutely with no concomitant improvements or deterioration in cognitive function and mood.

Funding source(s): NHMRC, ARC and WA Department of Agriculture and Food.

VITAMIN D STATUS AND PREDICTORS OF SERUM 25-HYDROXYVITAMIN D CONCENTRATIONS IN WESTERN AUSTRALIAN ADOLESCENTS

L.J. Black¹, S.A. Burrows², P. Jacoby¹, W.H. Oddy¹, L.J. Beilin², WC She Ping-Delfos², C.E. Marshall², P.G. Holt¹, P.H. Hart¹, T.A. Mori². ¹Telethon Kids Institute, Australia; ²School of Medicine and Pharmacology, The University of Western Australia, Perth, WA, Australia
E-mail: lucinda.black@telethonkids.org.au (L.J. Black)

Background/Aims: Despite the importance of skeletal growth during adolescence, there is limited research reporting vitamin D status and its predictors in adolescents. Using prospective data from the Western Australian Pregnancy Cohort (Raine) Study, we investigated vitamin D status and predictors of serum 25-hydroxyvitamin D [25(OH)D] concentrations in adolescents.