the molecular, mesoscopic and microscopic structures of partially digested extruded maize starches varying in amylose content and digestion rate.
**Methods**: Three maize starches with 27, 50 and 80% amylose levels were extruded at different moisture feed rates. Extrudates with varying moisture contents were digested (*in vitro*) at various times and undigested residues were freeze-dried. Raw, extrudate and partially digested starches were analysed for %starch digestibility, resistant starch, amylopectin branch length profile, helices, crystallinity, lamellar periodicity etc.
**Results**: Digestibility data showed the normal starch was close to 100% digested, whereas HAMS were ~30% digestible as granules and ~75% in extrudates. There was a significant decrease in long amylopectin chains due to shear during extrusion, resulting in shorter chains influencing starch digestibility. NMR and crystallinity data showed that extended digestion of extrudate results in a significant increase in molecular order or helical content. Mechanism of enzyme resistance of granular high-amylose starches is qualitatively different to that for processed starches.
**Conclusions**: Incorporation of HAMS to enhance resistant starch in foods can be achieved from either cooked or uncooked forms, but that the consequences may not be the same based on the different mechanisms involved in amylase digestion.
**Funding source(s)**: ARC.

## NEW STRAWBERRY BREEDING LINES – ENHANCED PHYTOCHEMICAL COMPOSITION AND BIOACCESSIBILITY

T. Zeilmann [1,2], M. Netzel [2], M. Herrington [3], M. Rychlik [1], T.J. O'Hare [2], K.J. Fanning [3]. [1] *Technische Universitaet Muenchen, Freising, Germany;* [2] *Queensland Alliance for Agriculture & Food Innovation, The University of Queensland, St. Lucia, QLD, Australia;* [3] *Agri-Science Queensland, Department of Agriculture, Fisheries and Forestry, Coopers Plains, QLD, Australia*
*E-mail: Kent.Fanning@daff.qld.gov.au (K.J. Fanning)*

**Background/Aims**: Screening of phytochemicals has been of interest in strawberry genotypes as there is emerging evidence from epidemiological and clinical studies that consumption of phytochemical-rich strawberry cultivars may provide health benefits. The aim of the present study was (1) to quantify selected phytochemicals in new strawberry breeding lines (BL) and (2) to assess the *in vitro* bioaccessibility of phytochemicals as an initial measure to predict their bioavailability.
**Methods**: Extracts of six strawberry breeding lines (BL) and two commercial varieties were analysed for anthocyanins, bound phenolics and ascorbic acid by HPLC-photodiode array detection-MS. Festival (commercial variety) and BL2006-221 (dark fruit colour) were blended and subjected to simulated gastric and small intestinal digestion. Differences between genotypes were tested using one-way ANOVA.
**Results**: BL2006-221 had the highest ($p < 0.05$) anthocyanin content (123 mg/100 g fresh weight, FW), whereas BL2011-210 was found to have the highest ($p < 0.05$) amount of ascorbic acid (53.5 mg/100 g FW) and bound phenolics (78 mg/100 g FW). The relative anthocyanin release, following gastric and small intestinal digestion procedure, was similar ($p > 0.05$) for BL2006-221 (36%) and Festival (47%). However the total anthocyanin released from BL2006-221 was 45% greater ($p<0.05$) than from Festival.
**Conclusions**: Breeding lines BL2006-221 and BL2011-210 showed promising results in terms of elevated concentrations of anthocyanins, bound phenolics ("substrate" for the colonic microbiota) and ascorbic acid. However, the *in vivo* relevance of these results as well as the consumer acceptance of dark (anthocyanin-rich) strawberry genotypes need to be investigated in future studies.
**Funding source(s)**: The Queensland Government.

## UTILISING COOKING METHODS CAN REDUCE THE FODMAP CONTENT OF LEGUMES TO ASSIST IN INCREASING FIBRE INTAKE

C. Tuck [1], J. Barrett [1], P. Gibson [1], J. Muir [1]. [1] *Department of Gastroenterology, Central Clinical School, Monash University, Alfred Hospital, Melbourne, VIC, Australia*
*E-mail: caroline.tuck@monash.edu (C. Tuck)*

**Background/Aims**: While legumes are an important source of dietary fibre, they may be avoided due to their potential to provoke functional gut symptoms (bloating, abdominal pain and change in bowel habits) due to their high content of FODMAPs. The solubility of FODMAPs offered an opportunity to specifically reduce their content by appropriate cooking techniques. The aim was to investigate the effect of cooking times and straining on the FODMAP content of legumes.
**Methods**: As a prototype, red lentils were simmered in water for variable lengths time. Seven variations were made including raw; simmered for 5, 10, 20 and 30 minutes and subsequently strained; simmered for 30 minutes without straining; and the strained liquid. Samples were analysed for their FODMAP content by enzymatic and HPLC techniques.
**Results**: The main FODMAPs present were fructans and galactooligosaccharides. Simmering reduced total oligosaccharide content from 1.78 to 0.44-0.53 g/serve, with no differences across different simmering times. The strained liquid after 30 min cooking contained 0.49 g/serve total oligosaccharide. Fructan content reduced from 0.50 g in raw to 0.13 (0.12-0.14) g in cooked and strained lentils, whilst unstrained lentils were higher (0.18g). The galactooligosaccharide content followed a similar pattern.
**Conclusions**: Due to rapid leaching of oligosaccharides, cooking legumes for a short duration with removal of the strained liquid reduces the FODMAP content by three-quarters. This strategy may facilitate the use of legumes to increase fibre intake in those attempting to reduce FODMAP intake because of functional gut symptoms.
**Funding source(s):** N/A.

## EFFECTS OF OAT β-GLUCAN ON BILE SALTS DIFFUSION ACROSS INTESTINAL MUCOSA USING THE USSING CHAMBER SYSTEM

P. Gunness [1], J. Michiels [2], S. De Smet [3], L. Vanhaecke [4], O. Kravchuk [5], M.J. Gidley [1]. [1] *Centre of Excellence in Plant Cell walls, University of Queensland, Australia;* [2] *Department of Applied Biosciences, Ghent University, Belgium;* [3] *Department of Animal Production, Ghent University, Belgium;* [4] *Department of Veterinary Public Health & Food Safety, Ghent University, Belgium;* [5] *Biometry Hub, University of Adelaide, SA, Australia*
*E-mail: nimagunness@uq.edu.au (P. Gunness)*

**Background/Aims**: The aim of this study was to investigate the effect of oat β-glucan (βG) on bile salts (BS) diffusion across the intestinal mucosa.
**Methods**: Pigs used as a human model were fed a control diet ($n = 6$) or a diet containing 10% oat βG ($n = 6$) for 28 days. Sections from the proximal, mid jejunum and terminal ileum were mounted into Ussing chambers. Glycodeoxycholate (GDC) with or without addition of oat βG to the mucosal side, was sampled from the serosal side every 20 minutes for 80 minutes. Fresh tissue samples and tissues after diffusion experiments were fixed for microscopy.
**Results**: GDC diffuses slower across the terminal ileum from pigs fed the βG diet. Added βG to the mucosal side reduces the diffusion of GDC across terminal ileal tissue from pigs fed the control diet but has no significant effect for tissues from the βG diet.
**Conclusions**: Oat βG reduces BS diffusion across terminal ileal tissue, consistent with a potential mechanism underlying plasma cholesterol reduction.
**Funding source(s)**: ARC.

## GINGER – MECHANISM OF ACTION IN CHEMOTHERAPY-INDUCED NAUSEA AND VOMITING: A REVIEW

W. Marx [1,2], K. Ried [2], A. Sali [2], L. Vitetta [3], D. McKavanagh [4], A. McCarthy [4], E. Isenring [1,5]. [1] *Health Sciences & Medicine, Bond University, Australia;* [2] *National Institute of Integrative Medicine, Australia;* [3] *Medlab, New Zealand;* [4] *Division of Cancer Services, Princess Alexandra Hospital (PAH) and Institute of Biomedical Innovation, Queensland University of Technology, Australia;* [5] *Department of Nutrition and Dietetics, PAH, Australia*
*E-mail: wolfgang.marx@student.bond.edu.au (W. Marx)*

**Background/Aims**: Despite advances in anti-emetic therapy, chemotherapy-induced nausea and vomiting (CINV) still poses a significant burden to patients undergoing cancer treatment. Nausea, in particular, is still highly prevalent in this population. While there is a large body of research that has investigated the potential mechanisms of action of gingers anti-nausea effect, this is the first review to evaluate the evidence-base for these proposed mechanisms.