Science Atlantic Nutrition and Foods Division

Annual Conference Speaker and Abstract Booklet 2025

Amplifying Student Research in Nutrition and Food Sciences since 2017

The Science Atlantic Nutrition and Foods Division Annual Conference (SANFCon) brings together budding scientists with people established in nutrition and food sciences in the Atlantic provinces. The conference is a place to practice, pitch, and engage in mentorship while exchanging new ideas, research, and practical solutions to problems in the field.

This year's conference theme is Nutrition and Food as Medicine, and it is exclusively online.

Overview

"The goal of the SANF conference is to provide undergraduate and graduate students with an opportunity to present their research and attend presentations from keynote speakers. This conference also gives students the opportunity to connect and network with other students and faculty from Universities across Atlantic Canada to further immerse them in the disciplines of Food and Nutrition Science."

Dr Jennifer Taylor, Nutrition and Foods Division Chair, Science Atlantic

This booklet includes speaker and abstract details, including talk summaries, authors, and keywords. The first part of this booklet introduces the keynote and guest speakers, and the rest is devoted to student speakers.

Keynote and Guest Speakers

The conference features respected speakers and knowledge keepers. Already experienced, these speakers will model public speaking, while sharing their work, aiming to challenge students to expand their knowledge and perspective. For talk summaries and bios, please see our website: [Science Atlantic Nutrition and Foods Conference 2025 - Faculty of Agriculture - Dalhousie University](#).

Keynote and Opening Speaker: Tuma Young

Mijipjewey na Pisun (Food as Medicine): Food Security, Land and Indigenous Rights as a Foundation

Affiliation: Unama'kik College Institute and Department of Political Science & Indigenous Studies, Cape Breton University, Sydney, NS

Guest Lecture: Thomas Pulinilkunnil

Amino Acid signalling and metabolism in health and disease

Affiliation: Dalhousie University, Faculty of Medicine, Dept. of Biochemistry and Molecular Biology; Dept of Physiology and Biophysics, Co-Lead (DalCREW; Dalhousie Cardiac Research Excellence Wave)

Guest Lecture: Petra Kienesberger

Bioactive lipid metabolism and signaling in metabolic disease

Affiliation: Dalhousie University, Faculty of Medicine, Dept. of Biochemistry and Molecular Biology

Keynote and Closing Speaker: David Ma

Diet and Health: From omega-3 lipids for cancer prevention, from experimental models to family's dietary intervention

Affiliation: Department of Human Health and Nutrition Sciences, University of Guelph

SANFCon25 Student Speakers

The main purpose of the conference is to give students the chance to present in a non-threatening environment, surrounded by their peers, and Atlantic mentors. Below, are the abstracts of students presenting their work at the SANFCon 2025!

The abstracts are numbered, and the speaker and student are generally the first author of the abstract. When this is not the case, the speaker and student's name is underlined. UG = undergraduate student, G = graduate student.

Note that abstracts are printed as received by the conference planning committee, save minor edits for formatting.

Abstract #39 – Poster, UG

The Role of Enzymes in Flavour Formation in Alternative Seafood Products

Alinta MacLeod, Dorris Onu, and Dr. Marcia English

Department of Human Nutrition, Saint Francis Xavier University, Antigonish, NS, B2G2W5

Introduction: The development of plant-based alternative seafood (PBSA) products can play an important role in alleviating some of the pressures on aquatic ecosystems and help to support environmental sustainability. A key step towards accelerating the commercialization of these foods is to examine how flavour is developed and modified during the processing and storage of these foods. Lipoxygenase (LOX) and lipase are enzymes that catalyze the oxidation of polyunsaturated fatty acids and free fatty acids to generate hydroperoxides that contribute to off flavours.

Objectives: To main objectives of this study were to evaluate the role of lipase and LOX in flavour development in PBSA formulations containing either flax seed oil, algae oil or an algal (omega-3) oil containing 40% DHA.

Methods: Lipase and LOX assays were conducted on all formulations and changes in enzyme activity and colour were also evaluated in the presence of a blueberry powder with antioxidant properties. All the formulations were compared to a commercial plant-based salmon product.

Results: Overall, Lox activity decreased ($P < 0.05$) in all samples in the presence of the blueberry antioxidant. However, this was only true for flax seed oil when lipase activity was compared. The commercial PBSA was also lighter in colour (L* value, 36.1$\pm$ 0.83) compared to other formulations.

Conclusion: The blueberry antioxidant was more effective in controlling Lox activity but for lipase, reduced activity was only observed in the samples that contained flax seed oil. Future studies will evaluate how these changes impact the flavour profiles of the PBSA formulations.

Abstract #38 – Poster, G

Defining dietary methionine requirements of TPN-fed neonatal piglets

Asha De Silva[1], Janet Brunton[1], Robert Bertolo[1]

[1]Memorial University

Introduction: Methionine is an essential amino acid required for protein synthesis and DNA methylation, which plays a crucial role in metabolic programming. Defining the optimal methionine requirement for preterm neonates receiving total parenteral nutrition (TPN) is vital to ensure proper growth and metabolic health. Prior studies have estimated the methionine requirement of TPN-fed neonatal piglets as 0.18 g/kg/d based only on whole-body protein synthesis, neglecting its role in methylation pathways. Understanding methionine partitioning between protein and non-protein pathways is necessary to optimize neonatal TPN formulations.

Hypothesis: We hypothesized that TPN-fed piglets require more dietary methionine than already established to accommodate both protein and non-protein pathways.

Objectives: The study tries to determine the methionine requirement for TPN-fed neonatal piglets using isotope kinetics to have both enhanced protein & non-protein pathways. Further, because too much methionine can be toxic, we will also identify the safe methionine levels for intravenously TPN-fed piglets.

Methods: We conducted a seven-day animal study using eighteen intravenously TPN-fed Yucatan miniature piglets with varying methionine levels to determine the neonatal TPN methionine requirement using isotope kinetics to trace methionine to its various products.

Expected results: The study results will determine the methionine requirement for whole-body protein synthesis and quantify the methionine partitioning to methylation pathways and protein in these piglets. Also, we will find the maximum safe methionine levels for intravenously TPN-fed neonatal piglets.

Conclusion: This research will provide recommendations for defining the optimum methionine level for neonatal TPN solutions to enhance early neonatal development and adult health.

Mots clés: Methionine Requirement, Non-protein Pathways, Total Parenteral Nutrition (TPN)

Abstract #37 – Poster, G

Exploring the Food Experiences of Newcomer University Students of Humanitarian Background

Daphne Lordly[1], Irene Ogada[1], Megan Henderson[1]

[1]Mount Saint Vincent University

Introduction: Attending university can be challenging for many students as they transition into independence and adulthood. Among newcomer students with humanitarian backgrounds, the additional transition into a new country further compounds the challenges often associated with limited access to resources, including food. However, there is limited literature on young adults of humanitarian background. The aim of this study, therefore, was to explore the food experiences of students of humanitarian background, at a Canadian University.

Methods: In-depth interviews were conducted with newcomer students of humanitarian background.

Results: Participants reported lacking access to sufficient quantities and varieties of foods prior to coming to Canada. Coping with food shortages involved skipping meals and relying on neighbours. Upon arriving to Canada, participants felt unfamiliar and overwhelmed with the quantity and diversity of foods provided. Some participants resorted to skipping meals and consuming a limited variety of foods, impacting physical and mental wellbeing. Learning from other students of similar background who had arrived previously helped students adapt to eating in Canada. Over time, participants reported incorporating both Canadian and traditional foods into their diet, and had improved confidence with respect to food and eating in Canada.

Discussion: The findings from this research to date indicate a need for additional support for students transitioning to new Canadian food environments. University campuses should consider identifying a designated food/nutrition support person to liaise with students. Holding meetings with students of humanitarian background to identify concerns and develop strategies for improvement of food acceptability may pre-empt/ minimize negative outcomes.

Mots clés : humanitarian newcomers, food experiences, university students

Abstract #36 – Oral, G

Profil des lipoprotéines plasmatiques en relation avec la carcinogenèse mammaire : étude cas-témoin

Abderrahmane MEZIANE[1], Hawa SIDIBÉ[1, 2], Imane HAMAM[1], Carole C. TRANCHANT[1], Abdelouahed KHALIL[2], Slimane BELBRAOUET[1]

[1]Université de Moncton, École des sciences des sciences des aliments et de nutrition, [2]Université de Sherbroocke, Département de médecine

Introduction et hypothèse. La littérature suggère que des perturbations des taux de cholestérol plasmatique pourraient augmenter le risque de cancer du sein (CS). Ainsi, il pourrait exister une relation entre le taux de cholestérol plasmatique total (CT), ses fractions lipoprotéiques HDL-C et LDL-C, et la carcinogenèse mammaire.

Objectif. Cette étude cas-témoins visait à déterminer une possible relation entre le CT, ses fractions HDL-C et LDL-C, et la carcinogenèse mammaire.

Méthodes. Cent cinq femmes ont été recrutées au Centre hospitalier universitaire Dr-Georges-L.-Dumont, NB, et réparties en trois groupes selon les résultats de mammographie: témoins (n=67, sans tumeur, 58,1±9,2 ans), cas bénins (n=18, tumeur bénigne, 52,7±9,9 ans) et cas malins (n=20, CS, 61±9,8 ans). Un questionnaire et des mesures anthropométriques ont permis de caractériser les groupes. CT, HDL-C et triglycérides (TG) ont été dosés par méthode enzymatique automatisée, et les LDL-C calculées par l'équation de Friedewald.

Résultats et discussion. Les taux plasmatiques de CT, LDL-C et TG ne différaient pas significativement entre les groupes. Toutefois, les HDL-C étaient plus basses dans le groupe CS comparé aux groupes témoin et bénin (1,28±0,37 vs 1,53±0,36 et 1,63±0,39 mmol/L, $p<0,05$). Les HDL-C présentaient une association inverse avec le risque de CS après ajustement pour l'âge et le ratio TT/TH (OR=0,15; IC 95% [0,03-0,82], $p<0,05$). Plusieurs mécanismes pourraient expliquer ces résultats.

Conclusion. Cette étude suggère que les HDL-C joueraient un rôle protecteur contre le CS, tandis que les CT, les LDL et les TG plasmatiques ne semblent pas liés au risque de développer un CS.

Mots clés: cancer du sein, cholestérol plasmatique, HDL-C

Abstract # 35 – Oral, G

Exploring the use of behavioural and environmental domain nutrition care process terminology by registered dietitians working in Nephrology

Laura Gosine[1, 2], Karthik Tennankore[2, 3], Sarah Hewko[4], Jennifer Brenton-Peters[5], Patty Williams[1], Shannan Grant[1, 6, 7, 8]

[1]Department of Applied Human Nutrition, Faculty of Professional Studies, Mount Saint Vincent University, [2]Nephrology Department, Nova Scotia Renal Program, Nova Scotia Health, [3]Department of Medicine, Faculty of Medicine, Dalhousie University, [4]Department of Applied Human Sciences, University of Prince Edward Island, [5]Te Whatu Ora Health New Zealand, [6]Department of Obstetrics & Gynecology, IWK Health Centre, [7]Department of Obstetrics & Gynecology, Faculty of Medicine, Dalhousie University, [8]Department of Women's Studies, Faculty of Arts and Science, Mount Saint Vincent University

Introduction: Millions of Canadians are living with chronic kidney disease (CKD). Dietetic intervention is crucial in preventing and treating CKD. The nutrition care process (NCP), and terminology (NCPT), is a tool used to communicate identified barriers to accessing food and gaps in nutrition knowledge. Registered dietitians RDs use NCPT when charting in the ADIME format (Assessment/Diagnosis/Intervention/Monitoring/Evaluation).

Objectives: Examine perceptions of RDs practicing in nephrology in NS on their use of the social determinants of health (SDoH) and the behavioural/environmental (B/E) diagnostic domains and capture the use in their medical charting.

Methods: A retrospective audit of RDs chart notes was completed (2015-2023) to capture the usage of B/E domain and SDoH terminology. A close-ended online questionnaire was distributed examining the perceived utilization of the B/E diagnostic domain in nutrition care. This data was analyzed descriptively.

Results: The audit demonstrated RDs primarily use the clinical diagnostic domain in their charting, accounting for 36% of the reviewed charts, only 22% of the RDs used the B/E domain. 20 RDs completed the questionnaire. 20% identified that they were unfamiliar with the B/E domain, with 30% recognizing that that they do not use this domain in their charting. 15% reported not using ADIME, which was demonstrated in the chart audit as many dietitians did not use the ADIME.

Significance: A growing body of evidence has highlighted that it is crucial that RDs understand and assess the social determinants. Understanding RDs current application of the NCP/NCPT, will enhance subsequent research questions, job aides and education.

Mots clés: NCPT, SDoH, ADIME

Abstract #34 – Poster, G

Green Extraction of Polyphenols from Haskap Berries Using pH-Modulated Pressurized Water

Supuni P. Gamage[1], Lord Abbey[2], Thu H. Pham[1], Lakshman Galagedara[1]

[1]School of Science and the Environment, Memorial University of Newfoundland, Corner Brook, NL, Canada, [2]Faculty of Agriculture, Dalhousie University, Truro, NS, Canada

Haskap berry (Lonicera caerulea L.) is rich in bioactive compounds, particularly polyphenols. Green extraction techniques have emerged as eco-friendly alternatives to conventional chemical extraction methods. Subcritical water under varying pH alters solvent properties, enhancing plant material extraction efficiency. This study employs pH-adjusted subcritical water to extract polyphenol-enriched compounds from haskap berries. A mixed-level factorial design was used to evaluate the effects of extraction temperatures (80°C, 100°C, 120°C), different solvent pH (6, 7, 9), and number of static cycles on extraction yield. Extractions were analyzed for physical parameters, total antioxidant activity (TAA), total phenolic content (TPC), anthocyanins, and polyphenols using high-performance liquid chromatography. The results revealed that the optimal conditions, (pH 6, 80°C, duplicate cycles) yielded the highest anthocyanin content (132 mg/g) and intense red pigmentation (a* = 30.7), indicating color intensity. A strong positive correlation ($r = 0.65$, $p<0.001$) was observed between TPC and anthocyanins, highlighting their substantial role in phenolic composition. The effect of duplicate cycles showed a significant ($p<0.05$) improvement of overall yield of anthocyanins and TPC and TAA for both types of haskap berries at varying pH levels. Increasing temperature did not show significant differences among the various extracts. Generally, an acidic pH (pH6) resulted in higher content of total antioxidants and total phenolics, however, this impact is significant ($p<0.05$) in one type of berry and not statistically different in the other type. This study highlights pH-modulated subcritical water extraction as an eco-friendly approach for optimizing bioactive compound recovery, effectively linking green chemistry with broader industrial applications.

Mots clés : Subcritical water extraction; antioxidants; factorial design

Abstract # 33 – Poster, G

Biosynthesis of B12 Vitamin and Bioactive Components through Microbial Fermentation of Fish Byproducts

Azka Tauqeer[1], Shyamchand Mayengbam[1]

[1]Department of Biochemistry, Memorial University of Newfoundland, Canada

The seafood industry generates over 20 million tons of nutrient-rich fish byproducts annually, much of which remains underutilized. This study explores the potential of microbial fermentation to convert fish waste into valuable compounds, focusing on vitamin B12 production and bioactive metabolites with antimicrobial and antioxidant properties. Using Pseudomonas denitrificans and Lactobacillus plantarum, we optimized fermentation conditions to enhance microbial growth and metabolite synthesis.

Results showed that P. denitrificans efficiently produced vitamin B12, while L. plantarum contributed to fermentation stability and additional bioactive compound formation. Growth curves and CFU analysis confirmed robust microbial activity in varying fish waste concentrations. Metabolomic profiling further identified key bioactive components, revealing significant metabolic shifts compared to control conditions and, at the same time, contributing to enhanced metabolite production.

These findings support a sustainable bioconversion strategy, transforming fish waste into functional ingredients for food, pharmaceutical, and nutraceutical applications. By integrating microbial biotechnology with waste valorization, this research provides an eco-friendly solution to the global challenge of seafood waste management. Future work will refine fermentation conditions and explore industrial-scale feasibility, bringing us closer to a circular economy in the seafood industry.

Mots clés : Vitamin B12, Microbial fermentation, Pseudomonas denitrificans, Lactobacillus plantarum

Abstract # 32 – Poster, G

A randomized controlled trial protocol: STudy on bluebeRries, prOteiN, and exercise for improvinG frailty and cardiovascular disease (STRONG)

Chris Consmueller[1], Leah Cahill[1], Isabel Jeon[1], Kenneth Rockwood[1], Susan Howlett[1], Olivia Mercer[2], Thomas Christensen[2], Debbie Wright[2], Scott Grandy[1]

[1]Dalhousie University, [2]Nova Scotia Health Authority

Introduction: Cardiovascular diseases (CVD) are a leading cause of death worldwide. Accelerated aging presents a greater risk of adverse health outcomes, CVD, co-existing diseases, and death. Frailty is a state of health decline that increases the likelihood for adverse health outcomes. Exercise and dietary modifications (protein and blueberry intake) can reduce frailty and CVD; however, the combined long-term effects of these three lifestyle behaviors have yet to be studied.

Objective: The purpose of this study is to determine if a 12-month protocol of exercise, protein, and blueberries (STRONG) reduces frailty and CVD risk in older Nova Scotians.

Methods: This randomized controlled trial will recruit 240 Nova Scotians (≥65 years, ~120 females and ~120 males). Participants will be randomly assigned to control or intervention (STRONG) groups. Control participants will receive standard medical care. The STRONG group will consume 30 grams of a protein supplement and 150 grams of wild blueberries daily, in addition to participating in three 60-minute exercise sessions per week, focusing on aerobic exercise, resistance training, and mobility. Measured outcomes will include changes in CVD risk factors, cardiovascular health, inflammatory markers, frailty, physical fitness, and health-related quality of life.

Implications: In Nova Scotia, CVD and frailty each present a significant burden on the health care system and negatively affect the health of its residents. STRONG study findings may offer needed evidence-based lifestyle intervention treatment plans aimed at lowering rates of frailty, CVD, and easing the burden on healthcare system.

Mots clés: frailty, cardiovascular disease, lifestyle modifications

Abstract # 31 – Oral, G

Optimization of Ultrasound-Assisted Extraction of Glucosinolates from Upcycled Cauliflower Using Response Surface Methodology

Hana Derbew Gedif[1], Vasantha Rupasinghe[2], Tess Astatkie[2], Joanna Tkaczewska[1]

[1]Krakow Agricultural University, [2]Faculty of Agriculture, Dalhousie University

Cauliflower (Brassica oleracea) is excellent sources of glucosinolates have shown great potential to prevent cancer and chronic diseases. The aim of this study optimizes ultrasound-assisted extraction (UAE) parameters (ethanol concentration, extraction temperature, and extraction time) to improve the recovery of glucosinolates content from upcycled cauliflower using response surface methodology. The optimized extraction method was compared with traditional extraction methods for glucosinolates content and total antioxidant capacity. The optimum UAE conditions identified for extraction of glucosinolates from upcycled cauliflower were: ethanol extraction 42% at 43°C for 30 minutes. Under the optimized UAE conditions, total glucosinolates was 7473.7 µg SE/g DW, while the predicted value was 9448.477 µg SE/g DW. The traditional extraction method (70% MeOH) showed the highest antioxidant activity, with FRAP and DPPH values of 334.7± 22.24 µg TE/g DW and IC_{50} of 2.01 ± 0.12 mg/ml, respectively. The UPLC-ESI-MS analysis confirmed that UAE yielded the highest levels of glucoraphanin ((1.31 ± 0.12ug/g ug/g) and sulforaphane (28.15 ± 3.34ug/g). The optimized UAE process significantly enhanced the extraction valuable phytochemicals from upcycled cauliflower extract. Further studies should focus on evaluating their therapeutic and preventive potential for practical applications in nutrition and health.

Mots clés : Glucosinolates content; ultrasound-assisted extraction and upcycled cauliflower

Abstract # 30, Poster, G

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Cultural Foodways and Food Security: Exploring Adaptation and Resilience Among Newcomer Nigerian Mothers in Halifax, Nova Scotia

ADEOLA OYAGBOHUN[1], Patty Williams[1], Irene Ogada[1]

[1]Mount Saint Vincent University

Background: Food plays a central role in cultural identity, but migration often disrupts access to familiar foods, impacting dietary practices and food security. Food security refers to the availability, accessibility, affordability, and acceptability of safe and nutritious food, ensuring everyone has the necessary variety and amount for an active and healthy life. This study explored how mothers of Nigerian descent in Halifax Regional Municipality (HRM), maintain and modify their food traditions while navigating food insecurity.

Methods: This study used a qualitative multi-case study approach; data were collected through semi-structured interviews and cooking as inquiry (CAI) sessions from women who had immigrated from Nigeria, had at least one child aged 0-6, had lived in Canada for five years or less, and had experienced household food insecurity within the past 12 months.

Results: Findings reveal that Nigerian newcomer mothers face significant challenges in accessing culturally significant foods due to affordability, availability, and changing household dynamics. Despite these barriers, they adopt coping strategies to maintain their families’ dietary and cultural identities.

Conclusion: This presentation will explore how these findings can help improve culturally inclusive food security policies and programs for Nigerian newcomer families in Halifax, with insights relevant to other newcomer communities in Nova Scotia.

Mots clés : Cultural food ways; food security; Nigerian mothers, Newcomers

Abstract # 29, Poster, UG

Community Gardens: Potential for Co-learning and Enhancing Wellbeing

Aluet Mabior[1], Shannan Grant, Denise Daley, Irene Ogada

Mount Saint Vincent University

Background: Gardening has been shown to improve physical and mental well-being while enhancing dietary habits. Research highlights its role as an interactive learning tool, yet little is known about how community-based food initiatives, such as community gardens and food banks, contribute to student learning and social responsibility. This study examines how participation in these initiatives influences students' knowledge, attitudes, and skills related to food systems and food security.

Methods: Community gardens and food banks were used as learning sites where students, instructors, and community partners engaged in hands-on activities related to food production, distribution, and sustainability. A content analysis of participant reflections was conducted to identify themes related to knowledge acquisition, skill development, and perceptions of food security.

Results: Several key themes emerged: (1) Mutual Learning -students, instructors, and community partners engaged in reciprocal knowledge exchange; (2) Connection to Food and Sustainability - students gained a deeper appreciation for food sources and sustainability practices; (3) Empathy and Awareness of Food Insecurity - working with food banks heightened awareness of food insecurity and fostered social responsibility; and (4) Application of Skills Beyond the Classroom - students reported intentions to apply their gardening knowledge in personal and professional settings.

Conclusion: Integrating community gardens into education enhances learning, well-being, and social responsibility. Future research should explore the long-term impact of these experiences on career paths, food choices, and advocacy efforts.

Mots clés: community gardens, food banks, community, sustainability

Abstract # 28 – Poster, UG

Promoting the Importance of Early Life Nutrition for Healthy Development and Prevention of Adult Chronic Disease.

Tara Perrot[1], Claire Miner

Department of Psychology and Neuroscience, Faculty of Science, Dalhousie University

The impact of parental nutrition, and offsprings nutrient intake during the first 1000 days of life is vital to further development and adult health. This is well-explained by the Developmental Origins of Health and Diseases (DOHaD) hypothesis which claims that harmful experiences occurring during the prenatal and/or postnatal period causes a change in a fetuses epigenetic make-up affecting their physical and cognitive development. As systems are 'plastic' during development, harmful experiences are able to negatively program these systems, increasing the risk for chronic diseases, such as metabolic disorders . These harmful experiences are known as early life stressors (ELS), which could include, poor nutrition, low access to nutritious foods, and environmental pollutants. Children exposed to an ELS experience a "hit", first hits are often prenatal, and could include maternal obesity or chronic exposure to western diet in either parent. "Second hits" tend to occur postnatally and include early introduction of carbohydrate-rich foods in infanthood and exposure to food of poor nutritional value in early childhood. Reducing the likelihood of any "hit" especially early on in life is vital to reducing the likelihood of developing disease in adulthood.

We aim to develop initiatives to promote public awareness of how nutrition intersects with early development and affects adult health. These initiatives will be based on empirical evidence and intersect and collaborate with current programs such as provincial pre-school and local daycares. Successful implementation of initiatives will result in a healthier generation, with a lower risk of developing disease related to poor nutrition.

Mots clés : Parental Nutrition, Early Nutrition, DOHaD

Abstract #27 – Poster, UG

A high omega-3 polyunsaturated fatty acids diet increased brain-derived neurotrophic factor gene expression in the adult offspring of maternal immune activation mouse model.

Brandon Dalton[1], Nancy Rawal, Courtney Clarke, Innocent Okagu, Francis Bambico, Sukhinder Cheema

1. Department of Biochemistry, Faculty of Science, Memorial University

Introduction: Inflammation during the third trimester of pregnancy disrupts fetal brain development, increasing the risk of schizophrenia (SCZ)-like deficits in the offspring. Omega (n)-3 polyunsaturated fatty acids (PUFA) are anti-inflammatory and neuroprotective. Hypothesis/Objectives: Adult offspring of maternal immune-activation (MIA) mouse-model dams fed a high n-3 PUFA diet will have higher brain-derived neurotrophic factor (BDNF) gene expression, compared to low n-3 PUFA diet. Methods: The MIA-mouse-model was used to examine the effects of high- vs. low-n-3 PUFA diets on BDNF gene expression in adult offspring. Pregnant C57BL/6 dams received intraperitoneal lipopolysaccharide (LPS: 0.1 mg/kg) or saline on gestation day 14.5 and were given high or low (5% or 1% w/w of total fatty acids, respectively) n-3 PUFA diets until weaning. Offspring (male and female) were switched to a standard chow diet; behavior testing was conducted for dams, juvenile postnatal day (PND 21), and adult (PND 60) offspring. Brain samples were collected after behavioural testing from the dams and adult offspring, snap-frozen, and kept at -80°C till further analysis. Total RNA was extracted from adult offspring brains (n=8, each group); BDNF mRNA expression was measured using real-time PCR with beta-actin as a housekeeping gene. Data was analyzed using ΔΔCT and two-way ANOVA. Results: Male offspring from dams fed a high n-3 PUFA diet had higher BDNF mRNA expression, compared to the low n-3 PUFA group. No changes were observed in female offspring. Discussion: These findings suggest that high n-3 PUFA diet may provide neuroprotective effects in the offspring of the MIA-mouse-model.

Funded by NSERC

Mots clés: Omega-3 PUFA, Neurotrophins, Brain health

Abstract # 26 – Poster, G

Investigating the Impact of B-Vitamin Deficiency and One-Carbon Impairment on Host Gut Integrity, Immune Function and Overall Metabolism in Murine Animal Models

Ayush Berry[1], Shyamchand Mayengbam[1]

[1]Department of Biochemistry, Memorial University of Newfoundland, St. John's, NL A1C 5S7, Canada

Abstract: Water-soluble B vitamins, specifically vitamins B6, B9 and B12, are required as coenzymes in a plethora of metabolic processes, including 1-carbon metabolism, a universal metabolic cycle responsible for transferring 1-carbon groups. This pathway is crucial for the biosynthesis of nucleic acids, neurotransmitters, and phospholipids and for regulating epigenetic modifications. While the metabolic roles of B vitamins are well understood, their role in 1-carbon metabolism and how they regulate gut-related immune functions requires further investigation. We hypothesised that Vitamin B deficiencies disrupt 1-carbon metabolism, leading to compromised gut integrity and altered metabolism, which in turn impairs immune function. Using animal models, we will investigate if B-vitamin deficiencies influence the markers of gut integrity, such as lipopolysaccharides and occludin, as well as immune and inflammation, including IL-6 and TNF-a, and Peptide YY. Furthermore, targeted and untargeted metabolomics will be applied to understand the mechanistic insight. This research aims to decipher how B vitamins maintain gut integrity and immune function, potentially identifying novel preventive approaches in metabolic diseases.

Funding: NSERC and Memorial University of Newfoundland.

Mots clés : B Vitamins, Gut health, One Carbon Metabolism, Immune function

Abstract #25 – Poster, G

The Association Between Milk and Dairy Product Consumption and Body Fat and Weight Status in School-Aged Children in The St. John's Metropolitan Area

Jacob Hearty[1], Zahra Farahnak[1]

[1]Memorial University of Newfoundland

Introduction Childhood obesity is a growing global health concern, which increases the risk of chronic disease later in life. Recent evidence suggests an inverse relationship between dairy intake and risk of obesity in children. Dairy products provide essential nutrients for children's healthy development, but consumption has declined, especially in Newfound and Labrador, where Canada's childhood obesity rates are highest. Research Question Is dairy intake associated with a reduced risk of obesity in children?

Objectives This study will determine the association between milk and dairy consumption and body fat, weight status and overall growth in school-aged children. The association of dairy intake with age, sex, and pubertal status will be explored.

Methods Boys and girls aged 6 to 12 years old will undergo anthropometric assessments, including height/weight, and hip/waist measurements. Total fat mass will be assessed using bioelectrical impedance analysis (TANITA MC-780U Plus P). Parents will be asked to report their child's dietary intake by completing a standardized 3-day non-consecutive diet diary. The recorded dietary data will be entered into the ASA24 tool for nutrient intake analysis. Furthermore, a short dairy survey will evaluate children's dietary habits and dairy consumption. Blood samples will be collected to analyze biomarkers associated with obesity.

Results: We expect to observe an inverse association between dairy consumption and risk for obesity in children.

Conclusion: Our findings will provide evidence regarding dairy consumption and its association with obesity in Newfoundland children. This research will provide evidence to improve provincial health programs for the prevention/treatment of childhood obesity.

Mots clés: Childhood Obesity, Milk, Dairy

Abstract # 24 - Poster, G

A Comparison of Knowledge, Attitudes, and Practices Between Primary School Pupils Receiving a Practical Agri-Nutrition Education Program and Students Receiving a Conventional Nutrition Curriculum in Kenya.

Roseglory Karimi[1], Jennifer Taylor, Colleen Walton

1. Food and Nutrition Program, Faculty of Science, University of Prince Edward Island

Introduction: UPEI has partnered with PEI's Farmers Helping Farmers (FHF) to implement successful Practical Agri-Nutrition Education (PANE) interventions in schools in Kenya to improve food preparation practices and reduce micronutrient malnutrition. However, there is now a need to evaluate a new enhanced curriculum that includes a food safety component which has been added as part of a FHF One Health initiative.

Objective: To compare the effectiveness of a school-based PANE intervention on student's nutrition and food related knowledge, attitudes, and practices (KAP) compared to those receiving the current theory-based Kenyan school nutrition curriculum (KNSC).

Methods: A quasi-experimental pre-post design will be used. Grade 5 students at the three schools (15 students each) will receive a 6-week PANE intervention (Feb-June, 2025). Students in the three comparison schools (15 students each) will receive the KNSC. There will be a total of 90 students (45 per group). The enhanced PANE was modeled on our previous programs and has been piloted. A 45 item pre-tested questionnaire will be used to assess KAP before and after the intervention. Differences in KAP means will be assessed using Student's t-tests. Differences in proportions will be assessed with Chi-Squared tests. The project received approval from the UPEI Research Ethics Board.

Next Steps: Pre-intervention data has been collected in both groups; post intervention data will be collected in June 2025. We anticipate that the intervention group will have higher knowledge levels, more positive attitudes towards recommended practices and more frequent adoption of recommended practices than the comparison group.

Mots clés: agri-nutrition program Kenya School children

Abstract # 23 – Poster, G

Berries vs. Fatty Liver: How Flavonoids Activate the Body's Defense System

Cindy Yu[1], Vasantha Rupasinghe[1, 2]

[1]Department of Plant, Food, and Environmental Sciences, Faculty of Agriculture, Dalhousie University

[2]Department of Pathology, Faculty of Medicine, Dalhousie University

Introduction: Metabolic dysfunction-associated steatotic liver disease (MASLD) is a rapidly rising chronic liver disease characterized by excessive hepatic lipid accumulation without significant alcohol consumption. Its global adult prevalence is projected to rise from the current 38% to over 55% by 2040. MASLD is associated with lipid dysregulation, oxidative stress, and inflammation. AMP-activated protein kinase (AMPK) and Nuclear erythroid 2-related factor 2 (Nrf2) are critical regulators of cellular energy metabolism and redox balance, respectively, with emerging evidence suggesting their cooperative role in metabolic diseases. Flavonoids, abundantly found in berries, are known activators of AMPK and Nrf2. We examine how selected flavonoids target the AMPK/Nrf2 signalling axis for MASLD management, filling the knowledge gap in the associated mechanism and direct molecular targets involved. Methodology: Using a fatty acid-induced hepatosteatosis cell model, selected flavonoids and their phase II metabolites will be screened for hepatoprotective effects, measuring lipid content, lipid peroxidation, and oxidative stress markers. Using AMPK inhibitor and Nrf2 knockout in mouse hepatocytes, we explore the molecular mechanism of the flavonoid-mediated AMPK-Nrf2 interaction. Molecular docking will reveal the binding affinity and interaction between flavonoids and target proteins. Efficacy of the flavonoids will be evaluated in a 12-week high-fat, high-sucrose, and high-cholesterol diet-induced obesity model using C57BL/6 mice, with an emphasis on AMPK-Nrf2 interaction. Expected outcomes: We expect to identify specific binding site where flavonoids interact with AMPK/Nrf2, revealing potential therapeutic targets for MASLD. Results may provide mechanistic evidence supporting berry consumption as a dietary intervention for MASLD prevention.

Mots clés : Flavonoids, AMP-activated protein kinase (AMPK), Nuclear erythroid 2-relaated factor 2 (Nrf2)

Abstract # 22 – Poster, G

Maternal Breastfeeding Support: Perspectives of New-comer Mothers of African Descent

Olayemi Oladipupo[1], Irene Ogada[1]

[1]Mount Saint Vincent University

Background: Social and professional support have been shown to enhance breastfeeding experiences and rates in local and global settings. Among newcomers, social, cultural, and economic transitions can impact maternal support systems for breastfeeding.

Methods: To collect data, In-depth interviews (IDI) and a focus group discussion (FGD) were conducted with newcomer mothers of African descent, with children ages 6-36 months in Halifax, Nova Scotia. Data was transcribed verbatim before coding and thematic analysis.

Results: Peer-support in Halifax, as well as social and healthcare provider support received prior to immigration enhanced maternal breastfeeding experiences. Additionally, maternal choices and experiences were influenced by gaps in health information, and different health communication approaches pre- and post-immigration.

Conclusion: The findings of this study may inform stakeholders concerned with optimal nutrition among mothers and children in Halifax. Addressing the gaps in programs for newcomers of African descent, in Halifax Regional Municipality, would specifically benefit this population, and by extension, other newcomers with similar experiences.

Mots clés : Maternal and child nutrition, Breastfeeding, Newcomers

Abstract # 21 – Poster, UG

Sex-specific effects on plasma triglyceride levels in adult offspring of C57BL/6 dams fed diets high or low in n-3 fatty acids and subjected to maternal-immune activation

Rachel Windsor[1], Nancy Rawal[1], Courtney Clarke[2], Innocent Okagu[1], Francis Bambico[2], Sukhinder Cheema[1]

[1]Department of Biochemistry, Memorial University, St. John's, NL A1C 5S7, Canada, [2]Department of Psychology, Memorial University, St. John's, NL A1B 3X9, Canada

Introduction: Schizophrenia (SCZ) is a neurodevelopmental disorder linked to maternal inflammation during pregnancy, which disrupts fetal brain development and increases the risk of SCZ-like deficits in offspring. Omega-3 (n-3) polyunsaturated fatty acids (PUFAs) are essential for fetal brain development and have neuroprotective effects. They also regulate lipid metabolism, inflammation, and metabolic function in dams and offspring. Hypothesis: Maternal immune activation (MIA) dams fed a low n-3 PUFA diet during late pregnancy, and lactation will exhibit dysregulated lipid metabolism and increased inflammation compared to MIA dams fed a high n-3 PUFA diet. Furthermore, offspring of dams fed a low n-3 PUFA diet will show dysregulated lipid metabolism and inflammation. Objectives: To measure plasma triglyceride and IL-6 (inflammatory marker) in dams and offspring. Methods: MIA mouse model was used to examine the effects of high- and low-n-3 PUFA diets on plasma triglycerides and inflammation. Pregnant C57BL/6 mice received intraperitoneal lipopolysaccharide (LPS; 0.1 mg/kg) or saline at gestation day 14.5 and were fed high-fat diets (20% w/w) with either 1% or 9% n-3 PUFAs until weaning. Offspring transitioned to a chow diet and underwent behavioural testing at postnatal day 70, and blood samples were then collected for triglyceride analysis. Results: No significant differences were found in dam triglycerides; however, female offspring of saline dams fed a high n-3 PUFA diet showed higher triglyceride levels compared to LPS-dams fed a high or low n-3 PUFA diet. Discussion: My findings suggest a sex-specific effect of diet and LPS on offspring lipid metabolism. (Funded by NSERC)

Mots clés: omega-3 PUFAs, lipid metabolism, neurodevelopment

Abstract # 20 – Poster, GA

Assessing the Impact of Climate Change on Food Insecurity: A Global Gender Based Analysis Across High Climate Risk Countries

Sophie Geernaert[1]

[1]Dalhousie University - Department of Community Health and Epidemiology

Introduction: Food insecurity (FI) is a pressing global challenge, exacerbated by climate change (CC) through disruptions in food availability and accessibility. Socioeconomic inequities further amplify FI, disproportionately affecting vulnerable populations. This study assesses the impact of CC on FI and explores gender disparities. Objectives: 1. Assess the impact of temperature, and climate disasters on severe and moderate-to-severe FI. 2. Evaluate how socioeconomic and demographic factors (e.g., Human Development Index, conflict levels, population growth, agricultural production) moderate this relationship. 3. Examine gender disparities in FI due to CC impacts. Methods: A global dataset of 141 climate-risk countries (2018-2023) integrates FAO FI data with CC indicators. Climate variables include temperature changes from pre-industrial baseline, and climate-related disaster frequency. Gender-stratified analyses and time-series regression models are planned to assess trends and moderation effects. Results: Preliminary findings (descriptive statistics) suggest that countries are experiencing rising temperatures and climate disasters. Gender disparities show higher FI among females and are statistically significant for all years from 2018-2022. Discussion & Conclusion: This research underscores the intersection of CC, FI, and gender inequities, highlighting the need for climate-adaptive, gender-responsive nutrition strategies. Findings contribute to global efforts in strengthening food security and resilience.

Mots clés : Food Insecurity, Gender Disparities, Climate Change

Abstract #19 – Poster, UG

The effects of a high-fat diet on muscle mass and strength in male and female Sprague- Dawley Rats

Aine Waterhouse[1], Inemesit Nyong[1], Zahra Farahnak[1]

[1]Memorial University of Newfoundland

Introduction: Evidence suggests that obesity may impair muscle health, leading to reduced muscle mass and strength. This study aimed to examine the effects of a high-fat (HF) diet on muscle mass and strength in a diet-induced obese (DIO) rat model.

Hypothesis: A high-fat diet will reduce muscle mass, leading to impaired muscle strength and function.

Objectives: To assess muscle mass and strength between control and high-fat diet groups.

Methods: Eight-week-old male and female Sprague-Dawley rats (n=34) were randomly assigned to either a control diet (AIN-93M, 10% kcal from fat) or a HFD (35% kcal from fat) for eight weeks. Body weight and food intake were monitored biweekly. Muscle strength was assessed using a Grip Strength Meter at baseline, midpoint, and endpoint. Quadriceps, gastrocnemius, and soleus muscles were collected after euthanization for further analysis.

Results: To be shown in oral/poster presentation.

Discussion: These findings suggest that while a HFD may increase muscle mass, it negatively affects muscle function, leading to reduced relative strength.

Conclusion: A high-fat diet compromises muscle strength despite minor increases in muscle mass.

Mots clés : High-Fat Diet, Muscle Strength, Muscle Mass

Abstract #18 – Oral, UG

Sodium Intake Is Associated with Poor Diet Habits and Increased Adiposity in Adults Aged 40 and Older in Newfoundland and Labrador.

Ella Smith[1], Morgan LeDrew[1], Zahra Farahnak[1]

[1]Memorial University of Newfoundland

Introduction: Recent evidence suggests that increased sodium intake is related to poor cardiovascular outcomes and hypertension, with obesity also being a risk factor.

Research Question: Whether increased sodium intake is associated with greater adiposity.

Objectives: To assess the relationship between dietary sodium intake and adiposity in adults aged 40+ in Newfoundland and Labrador.

Methods: Healthy male and female adults aged 40+ (n=51) were evaluated for fat mass, using BIA (TANITA). A 24-hour recall was completed using the ASA24 tool to assess dietary intake. Independent sample t-tests and Spearman correlations were performed.

Results: Participants were 57.6 ± 8.6 years (mean ± SD) of age, 77% were female, 75% were born in NL and 96% were white. Fat mass was 21.9 ± 1.6 kg in females vs. 20.3 ± 3.1 kg in males. Sodium intake was 2765.6 ± 227.1 in females vs. 3097.0 ± 311.0 in males. Other results will be shown in oral presentation.

Discussion: Our preliminary findings showed that our participants had high sodium intake, which was associated with increased fat and protein intake, as well as overall higher caloric intake. Additionally, the sodium-potassium intake ratio was correlated with increased measures of adiposity, such as BMI and visceral fat rating.

Conclusion: Our findings suggest that increased sodium intake is associated with increased adiposity and poor dietary habits in our participants.

Mots clés: Sodium intake, Obesity, Diet habits

Abstract #17 – Poster, UG

Bridging Health and Sustainability: The Role of Traditional Health Beliefs in Food Consumption

Yiru Wei[1], Yanbo Xiao[2], Wenguang Zhang[3], Ji Lu[1]

[1]Dalhousie University, [2]Beijing University of Chinese Medicine, [3]Beijing Normal University

Connecting nutrition and environmental sustainability presents challenges for agri-food systems to align consumers' motivations for personal health with social responsibility. This study examines a psychological mechanism through which Chinese Traditional Health Beliefs (THB) may influence healthy eating and sustainable consumption, providing insights into how cultural frameworks can guide responsible food choices.

An online survey of 978 Chinese consumers was conducted to analyze how THB shapes food consumption, linking personal health concerns with environmental consciousness. Structural equation modeling results indicate that beliefs centred on living in harmony with nature significantly enhance the connection between health motivations and sustainability values, leading to more responsible food consumption behaviors.

These findings highlight the potential of culturally rooted perspectives in shaping public health strategies and food policies, particularly in promoting nutritious foods and sustainable dietary practices. By leveraging THB in nutrition education and communication initiatives, policymakers, healthcare professionals, and the food industry can foster a more health-conscious and environmentally responsible food system.

Mots clés : Traditional Health Beliefs, sustainable food consumption, public health strategies

Abstract #16 – Oral, G

Dietary and Supplemental Vitamin D Intake Is Associated with Reduced Adiposity in Adults

Morgan LeDrew[1], Zahra Farahnak[1]

[1]Memorial University

Introduction: Emerging evidence suggests that vitamin D may play a role in reducing adiposity, while obesity can be a risk factor for vitamin D deficiency. Understanding this relationship is particularly important in populations at higher risk of obesity. Research Question: Whether adequate vitamin D intake is associated with lower adiposity.

Objectives: To assess the relationship between vitamin D intake and adiposity in adults aged 40+ in Newfoundland and Labrador.

Methods: Male and female adults aged 40+ (n = 48) were assessed for fat mass (kg and %) using bioelectrical impedance analysis (TANITA MC-780U Plus P). Participants completed a 24-hour recall using ASA24, and self-reported supplement use was recorded. Analysis included independent t-tests/Mann-Whitney U tests and Spearman correlations.

Results: Participants were 57.7 ± 8.7 years (mean ± SD) of age, 75% were female, 75% were born in Newfoundland and Labrador, and 96% were white. Participants were divided into two groups based on vitamin D supplement use; group A (n = 26): supplementation ≥800 IU/day and group B (n = 22): No supplementation. To be shown in oral presentation.

Discussion: Our preliminary findings showed that both dietary vitamin D intake and supplement use are associated with reduced adiposity. Additionally, the positive associations between dietary vitamin D intake and dietary protein, calcium, and phosphate intake suggest that higher vitamin D intake may be linked to overall healthier dietary habits.

Conclusion: Our findings suggest that adequate vitamin D levels may support healthier body composition and dietary habits.

Mots clés: Vitamin D, Obesity, Nutritional biochemistry

Abstract #15 – Oral, G

Prix de vente au détail d'une sélection d'aliments nutritifs et impact des détaillants alimentaires : Étude longitudinale prospective au Nouveau-Brunswick

Sabrina Dahmani[1], Jeanne Godin[1], Carole C. Tranchant[1]

[1]École des sciences des aliments, de nutrition et d'études familiales, Université de Moncton

Introduction. Les contrecoups de la pandémie de COVID-19 combinés à plusieurs facteurs géopolitiques compliquent l'atteinte de la sécurité alimentaire. Les effets se font sentir à différents degrés dans diverses régions, comme le Canada atlantique qui affiche des taux d'insécurité alimentaire des ménages plus élevés que la moyenne nationale. Dans ce contexte, les études sur l'accessibilité économique des aliments sains, en particulier la variabilité des prix au détail, s'avèrent essentielles pour informer la population.

Objectif et hypothèse. Cette étude vise à évaluer les variations des prix de vente au détail d'une sélection d'aliments du panier de provisions nutritif - Canada, dans deux villes au Nouveau-Brunswick. Elle examinera les écarts de prix entre les principaux détaillants et les variations saisonnières, en présumant qu'il existe des variations de prix selon les enseignes suivant leurs stratégies commerciales, selon les saisons en fonction de la disponibilité des produits, et selon la localisation géographique.

Méthodes. L'étude est de type observationnelle, longitudinale et prospective. Les données seront recueillies par audit dans les magasins de quatre grandes chaînes alimentaires dans les villes de Dieppe et Moncton pendant trois saisons consécutives. Les prix seront standardisés par poids ou volume et ajustés en fonction des promotions grâce à l'analyse statistique ANCOVA.

Résultats et conclusion. Les résultats permettront d'identifier les facteurs spatiaux et temporels locaux qui influencent le prix des aliments, ce qui aidera à élaborer des mesures facilitant l'accès à une alimentation saine, en particulier pour les ménages à faible revenu qui sont les plus affectés par l'inflation alimentaire.

Mots clés : Coût des aliments, Panier de provisions nutritif, Nouveau-Brunswick

Abstract # 13 – Oral, G

Creatine precursors: What do we know?

Adar Buxton[1], Elizabeth Chia, Dr. Robert Bertolo

1. Memorial University

Over the years, creatine supplementation has become increasingly popular. Unfortunately, creatine is not readily soluble, so absorption is a challenge. While studies have found that carbohydrates improve absorption, a new finding has suggested the potential of creatine precursors (methionine and GAA) to influence creatine transport.

Using in vitro models, we hypothesized that dietary creatine precursors will enhance transport of creatine into blood circulation. Cells were incubated with radiolabeled isotopes and after a 90 min incubation period, samples were analyzed with a scintillation counter.

Results showed that the transport (appearance) of creatine into the 'blood chamber' was enhanced when dietary GAA increased (P=0.01). However, creatine disappearance from the 'lumen chamber' was not significant (P=0.22). Further experiments showed that the addition of creatine precursors in diet affects the brush border (lumen) and basolateral (blood) membrane differently; suggesting different transporters may be at work in each membrane. We also found that GAA transport (appearance) was enhanced when the concentration of creatine in the "blood chamber" increased (P=0.001). Finally, we compared these results to creatine transport in skeletal muscle. Results are showing methionine has a direct impact on creatine uptake (P=0.0092) and GAA enhances uptake only when it is 3 times the concentration of creatine (P=0.0011). These results improve our understanding of characteristics between the brush border, basolateral, and plasma membrane of skeletal tissue. Consequently, contributing to an overall better understanding of nutrition.

Funding is provided by the Canadian Institutes of Health Research & the Natural Sciences and Engineering Research Council of Canada

Mots clés : Nutrition, energy, supplement

Abstract # 12 – Poster, G

Investigating the Optimal Level of Guanidinoacetic Acid (GAA) Supplementation to Maximize Creatine Synthesis in a Yucatan Piglet Model

Reza Sepandifard[1]

[1]Memorial University of NL, Canada

Creatine is an essential compound for brain and neurological development and plays a key role in cellular energy homeostasis in neonates. Most of the neonate's daily creatine requirement is synthesized endogenously (~75%), starting with a reaction between arginine and glycine to produce guanidinoacetate (GAA), which is then methylated in the liver to form creatine. Limited arginine in neonatal diets can restrict its availability for creatine synthesis. Simultaneously, creatine supplementation is not ideal due to low stability and high cost. Supplementing GAA is the other option; however, its fate in the body has yet to be determined. This study aims to develop a strategy to ensure neonates have sufficient creatine by providing GAA in the diet. Previous studies showed that supplementing GAA is more effective than supplementing creatine, but only if an adequate amount of methionine is provided. Moreover, supplemental GAA could also spare arginine for other processes. We hypothesized that increasing the GAA level would increase creatine synthesis until a plateau is reached. The aim is to infuse diets with different GAA concentrations in Yucatan piglets (n=20) to determine how much GAA is required to reach the maximum creatine accretion and to measure its influence on sparing amino acids. Studies determined that 0.09 g/kg/day would fulfill the creatine accretion rate if entirely converted to creatine. However, this rate does not account for the efficiency of GAA absorption or obligatory excretion. We will further measure GAA accumulation in tissues and excretion rates to track excess GAA when not converted to creatine.

Mots clés : Creatine Synthesis, GAA, Neonates

Abstract # 11 – Oral, G

Dietary vitamin B6 modulates the gut microbiome composition and short-chain fatty acid levels in a mouse model of non-alcoholic fatty liver disease.

Sathya Amarasena[1], Ava Rasouli[1], Shyamchand Mayengbam[1]

[1]Memorial University of Newfoundland

Non-alcoholic fatty liver disease (NAFLD), a leading cause of chronic liver disease, is linked with gut dysbiosis. NAFLD is associated with dietary vitamin B6 deficiency, and B6 supplementation improves hepatic pathology. While dietary vitamin B6 modulates gut microbiome, the role of B6 in ameliorating NAFLD through gut-related mechanisms remains unclear. The study aims to investigate how dietary vitamin B6 levels affect gut ecology in NAFLD-mice model. Thirty-two C57BL/6J mice were fed either a control, high-fat-high-sugar (HFHS) diet with modified vitamin B6 levels; HighB6-HB6 (70 mg B6/kg diet), optimumB6-OB6 (7mg B6/kg diet), and deficientB6-DB6 (0.07mg B6/kg diet) for 8 weeks. Cecal samples were collected for microbiome profiling and short-chain fatty acid (SCFA) analysis. The HFHS diet decreased the relative abundance of Actinobacteriota and Bacteroidota and increased Verrucomicrobiota and Firmicutes compared to control group. The HFHS-DB6 diet increased the relative abundance of Firmicutes and Bacteroidota while decreasing Verrucomicrobiota compared to OB6 group. Microbial alpha diversity was reduced in HFHS group compared to the control, with no significant effects across the dietary B6 levels. Beta diversity analysis showed significantly different microbial communities in HFHS-OB6, HFHS-DB6, and HFHS-HB6 groups compared to the control group and across B6 levels. Differential abundance analysis revealed significantly altered microbes among these groups at species level. Additionally, cecal butyrate levels were significantly higher in HFHS-OB6 group compared to the control, while the HFHS-DB6 group exhibited significantly reduced cecal acetate compared to all others. In conclusion, dietary vitamin B6 influences gut microbial composition and SCFA content in NAFLD-mice model.

Abstract # 10 – Oral, UG

One's trash is another's treasure: An investigation into the sensory properties of luffa seed flour incorporated into cookies

Matthew Code[1], Matthew McSweeney[1]

[1]Acadia Unversity

Introduction: The luffa gourd or Luffa cylindrica is traditionally processed by removing the seeds, sap and skin and then dried to create an exfoliator product. Luffa seeds are currently a nutrient dense waste product that are high in protein, fibre, antioxidants, and essential amino acids.

Objective: The study aimed to evaluate the consumer acceptability of luffa seed powder in a baking application (cookies).

Methods: The seeds were roasted at 160°C for twelve minutes, ground and passed through a 60-mesh sieve to produce the luffa seed powder. Cookies were created with increasing amounts of luffa seed powder substituted into the cookie formulation for flour. The samples contained 0% (control), 2%, 4%, 7%, and 9% luffa seed powder. The cookies were then evaluated by consumers(n=96) using hedonic scales, check-all-that-apply, and a comment question about their attitudes towards luffa seeds was also included.

Results and Discussion: The incorporation of luffa seed powder negatively impacted the hedonic scores of the cookies at all percentage additions. As the concentration of luffa seed powder increased, participants identified off-flavours and textures. The overall liking scores of the 7% and 9% samples were negatively impacted by textural properties (i.e. dry, hard, and grainy) as well as earthy flavour and aftertaste. The green colour of the luffa seed powder cookies also decreased liking. Participants identified that they would be interested in luffa seed powder if it had health benefits or if it was a sustainable ingredient.

Abstract # 9 - Poster, G

One-Year Follow-Up: Is the NL Sugar-Sweetened Beverage Tax Clearly Displayed to Consumers?

Valerie Dawe[1], Scott Harding[1], Rachel Prowse[1]

[1]Memorial University of Newfoundland

Introduction: The NL Sugar-Sweetened Beverage (SSB) tax was implemented on September 1, 2022. The SSB tax aims to reduce SSB intake and encourage healthier beverage choices.

Objectives: We aimed to assess the implementation of the SSB tax by evaluating whether the SSB tax was visible to consumers.

Methods: Data were collected by conducting audits and purchasing single-serve beverages in 21 food stores. At each store, we purchased an average of 26 beverages. Visibility at shelf was calculated by the % of beverage labels that displayed the SSB tax. Visibility on receipt was calculated by the % of SSBs charged the SSB tax. Implementation of the tax by store was assessed according to extent and type of SSB tax visibility.

Results: Less than one in four stores displayed the SSB tax on their shelf labels. Ninety percent of stores charged SSB tax on receipt, though no stores charged the tax entirely accurately at the rate of $0.20/L. Sixty-two percent of the stores displayed the SSB tax on the receipt itemized by beverage, while twenty-four percent displayed the tax as an aggregate line (e.g. “Sugar Tax”). Some stores (14%) did not display or charge an SSB tax.

Conclusion: The SSB tax is not visible to consumers until they purchase in most stores, and SSB tax is sometimes not charged. The way the tax has been implemented one year after the start, may hinder the effectiveness of the tax on reducing SSB intake.

Mots clés : nutrition, health, policy

Abstract # 8 – Oral, UG

Encapsulation of Allyl Isothiocyanate Using Both Freeze Drying and Spray Drying Techniques: Impact on Chemical Components, Sensory Properties, and Saltiness

Dr. Nicoletta Faraone[1], Dr. Matthew McSweeney[2], Emily Dolan[2]

[1]Department of Chemistry, Acadia University

[2]School of Nutrition and Dietetics, Acadia University

Introduction: Salt is a widely used food additive due to its salty taste and ability to enhance other flavours. However, excessive salt intake negatively impacts cardiovascular health. As such, food reformulation strategies have been explored to improve consumer acceptance of sodium-reduced foods. Allyl isothiocyanate (AITC), a chemical compound found in horseradish, has been shown to enhance perceived saltiness. However, its application is limited due to its bitter, sour, and metallic notes, poor water solubility, and strong aroma. Encapsulation is a common technique in the food industry to mask undesirable flavours, improve handling, and increase water solubility. However, the sensory effects of encapsulated AITC remain unknown.

Objective: This study aimed to assess the suitability of various AITC encapsulation formulations through quantitative and qualitative analyses and evaluate their impact on the sensory profile of a sodium-reduced food product.

Methods: AITC was encapsulated using maltodextrin (MD) and gum Arabic (GA), with and without Tween-20 (T20) or Tween-80 (T80), via spray-drying (SD) and freeze-drying (FD). Gas chromatography (GC-FID) quantified AITC retention. Microcapsules were analyzed for surface morphology, moisture, and surface oil content. Consumers evaluated eight formulations in tomato soup (0.500 mg AITC/100 mL) (SD trial: n = 79, and FD trial: n = 93).

Results and Discussion: SD formulations with surfactants showed the highest AITC retention. While no formulation significantly altered basic taste perceptions, FD formulations generally enhanced creaminess, tomato flavour, and other sensory qualities, improving consumer acceptance.

Conclusion: Encapsulation may reduce AITC's off-flavours but could also diminish its saltiness-enhancing properties.

Mots clés: Encapsulation; Allyl isothiocyanate; Salt reduction

Abstract # 7 – Oral, G

Turning food waste into value: Optimizing sulforaphane extraction from upcycled broccoli using response surface methodology

Chandrika Chaturvedi[1], H.P. Vasantha Rupasinghe[1]

[1]Department of Plant, Food, and Environmental Sciences, Faculty of Agriculture, Dalhousie University, Truro, NS

Introduction: The agri-food industry increasingly recognizes upcycled fresh produce as a valuable source of bioactive compounds. Broccoli (Brassica oleracea var. italica), rich in glucosinolates (sulforaphane) show potent anti-inflammatory and antioxidant activities.

Hypothesis: Optimizing extraction parameters (temperature, time, and ethanol concentration) of the ultrasonic-assisted extraction will maximize sulforaphane recovery from upcycled broccoli.

Objective: To determine optimal extraction conditions for sulforaphane from upcycled broccoli by evaluating the effects of temperature, ethanol concentration, and extraction time.

Methods: Response surface methodology and central composite design were used to optimize extraction parameters. The extract from optimum conditions was compared with eight literature-reported extraction methods using total phenolic content, glucosinolate content, carotenoid content, total antioxidant capacity (FRAP and DPPH), and glucosinolates (sulforaphane, glucobrassicin, glucoraphanin) quantified using high-performance liquid chromatography-electrospray ionization mass spectrometry (HPLC-ESI-MS).

Results: The optimal conditions (36 °C, 23% ethanol, 38 min) predicted from the model resulted in sulforaphane (383.9 ± 0.83 µg/g DW), glucobrassicin (32.45 ± 1.93 µg/g DW), and glucoraphanin (18 ± 5.47 µg/g DW). Among the tested extraction variables, ethanol concentration had the most significant impact on sulforaphane extraction ($p < 0.05$). Compared to eight previously reported extraction methods, the optimized extraction process in this study provided the highest sulforaphane recovery.
Conclusion: Optimal ultrasonic-assisted ethanol extraction achieved highest sulforaphane recovery in a shorter time at lower temperature. The sulforaphane-rich extract can be used for formulating dietary supplements and nutraceuticals. These extracts show promise for preventing and treating chronic diseases, offering sustainable solutions for enhancing human health and well-being.
Mots clés: Upcycled Broccoli, Sulforaphane, Green extraction

Abstract # 6 – Oral, G

Development of a novel synbiotic food therapy concept to manage obesity using fermented proanthocyanidins

Wasitha P. D. W. Thilakarathna[1], Madumani Amararathna[1], H. P. Vasantha Rupasinghe[1, 2]

[1]Department of Plant, Food, and Environmental Sciences, Faculty of Agriculture, Dalhousie University, Truro, Nova Scotia, Canada.

[2]Department of Pathology, Faculty of Medicine, Dalhousie University, Halifax, Nova Scotia, Canada.

Introduction: Proanthocyanidins (PAC) are the most abundant polyphenols in the human diet. PAC are known to mitigate the risks of non-communicable diseases including obesity. However, the bioavailability of PAC is limited and the health benefits depend on their degradation into simple metabolites through gut microbiota.
Objective: PAC can be degraded into simple metabolites by creating Saccharomyces cerevisiae (SC)-based synbiotics. Novel PAC-metabolites produced by these synbiotics, namely, 3-aminophenol (3-AMP), 3-aminosalicylic acid, 2,4-dihydroxy-6-methylbenzaldehyde (2,4-DHMB), 4-hydroxyphenylacetamide (4-HPA), 3-phenyllactic acid (3-PLA), and 2,4,6-trihydroxyacetophenone were evaluated for antiadipogenic activities in vitro.

Methodology: The potential of PAC-metabolites to mitigate obesity risk was investigated by an insulin-induced adipogenesis model of 3T3-L1 mouse preadipocytes. Antiadipogenic activities of the PAC-metabolites were evaluated by measuring preadipocyte proliferation and cellular lipid accumulation through MTS and Oil Red O assays, respectively. The cellular mechanisms of PAC-metabolites in reducing lipid accumulation were studied by western blotting and molecular docking.

Results: PAC-metabolites, 3-AMP and 4-HPA were significantly potent in suppressing lipid accumulation at low concentrations (< 100 µM). This reduction in cellular lipid accumulation is attributable to the activation of 5´-adenosine monophosphate-activated protein kinase (AMPK) signaling and subsequent downregulation of peroxisome proliferator-activated receptor (PPAR)-γ and upregulation of PPAR-α signaling. Both 3-AMP and 4-HPA may prevent inactivation of AMPK signaling by competitively inhibiting insulin receptors.

Conclusion: PAC-metabolites, 3-AMP and 4-HPA can suppress adipogenesis by reducing lipid accumulation in differentiating preadipocytes in vitro. Thus, synbiotics of PAC and SC can be developed as potential therapeutics for obesity management.

Mots clés: Synbiotics, proanthocyanidins, Saccharomyces cerevisiae, obesity, 3T3-L1 preadipocytes.

Abstract # 5 – Oral, G

Vitamin E and C Supplementation in SMOFlipid® Enhanced the Antioxidant Status and Reduced the Liver Oxidative Stress in Neonatal Piglets during Prolonged PN Feeding.

Thilini Kumarasinghe[1], Robert F. Bertolo[1], Janet A. Brunton[1]

[1]Memorial University of Newfoundland

Introduction- Premature infants often require parenteral nutrition (PN) for survival and growth, but PN-related liver complications and intestinal atrophy often occur, possibly due to oxidative stress.
Hypothesis- Supplementation of a mixed-lipid emulsion (SMOFlipid®) with additional vitamins E & C will mitigate oxidative stress and reduce liver damage markers in neonatal piglets undergoing extended intravenous feeding.
Objective(s) - To determine whether greater antioxidant vitamin availability reduces indices of oxidative stress and markers of liver damage in PN-fed piglets compared to piglets provided the same diets without supplemental Vit E and C.
Methods- Piglets received either Control PN (n=10) or PN supplemented with vitamins E (10 mg/kg/day) and C (100 mg/kg/day) (Vit E&C, n=10) for ten days.

Results- Piglets in the Vit E&C group showed lower liver lipid deposition ($P<0.01$) and hepatic lipid peroxidation ($P<0.05$) than Controls, with no differences in triglyceride and cholesterol levels. Vitamin E levels in plasma and liver were higher ($P<0.001$ and $P<0.01$, respectively), while hepatic protein synthesis rates were unchanged. Full results will be presented.

Discussion- The supplemention of SMOFlipid® with vitamins E and C effectively reduced oxidative stress and hepatic lipid accumulation while enhancing vitamin E concentrations in neonatal piglets. These findings suggest that antioxidant vitamins in PN formulations can enhance antioxidant status and protect against liver damage.

Conclusion- This indicates potential benefits for including antioxidant vitamins in PN formulations to safeguard against liver damage in neonatal patients.

Supported by Ocean Frontier Institute Vitamin Research Fund

Mots clés: Parenteral Nutrition, Vitamins E & C Supplementation, Lipid Peroxidation, Oxidative stress

Abstract # 4 – Oral, G

Microencapsulated Fermented Wild Blueberries as a Functional Food Ingredient for Managing Diet-Induced Metabolic Syndrome

Dinushi Kaushalya Gamage[1], Vasantha Rupasinghe[1]

[1]Dalhousie University

Introduction: Wild blueberries (WB) are rich in bioactive compounds, but their instability limits their potential benefits. Fermentation enhances bioactive content, while microencapsulation ensures their stability. This study explores maltodextrin alternatives to develop fermented wild blueberry microcapsules (FWBM), as a safer non-pharmacological solution for managing diet-induced metabolic syndrome (MetS).

Hypothesis: Microencapsulation and fermentation will enhance the stability and bioactivity against MetS of WB compared to unprocessed WB.

Objective(s): To develop FWBM and assess their effectiveness against diet-induced MetS.

Methods: WB were subsequently fermented using Saccharomyces cerevisiae and Komagataeibacter spp., followed by microencapsulation through spray-drying using prebiotic fibers and plant proteins as partial or complete substitutes for controversial maltodextrin. The physiological benefits of this novel functional ingredient against MetS were assessed using a high-fat high-sucrose diet-induced obesogenic C57BL/6J mice model.

Results: The dual fermentation yielded beneficial postbiotics including short-chain fatty acids. Physicochemical analysis revealed that a carrier formulation comprising maltodextrin and inulin in equal proportions (1:1 w/w) exhibited microparticle properties compatible for industrial application of this functional ingredient.

Discussion: Supplementation with these microparticles resulted in significant reductions in body weight gain, liver weight, body fat, hepatic triglyceride, and plasma cholesterol compared to non-supplemented obese controls indicating potential efficacy in managing obesity-related metabolic disorders. However, the microparticles did not improve glycemic control or insulin sensitivity suggesting that the benefits may be specific to certain aspects of metabolic health.

Conclusion: The synergistic combination of fermentation and microencapsulation significantly enhances the bioactive content of WB. FWBM shows promise in ameliorating lipid dysmetabolism in vivo.

Mots clés: Wild blueberries, functional ingredients, metabolic syndrome

Abstract # 3 – Oral, G

Development of novel functional food ingredients by microbial biotransformation of grape seeds

Kavindya Samarakoon[1], H.P. Vasantha Rupasinghe[1]

[1]Department of Plant, Food and Environmental Science, Faculty of Agriculture, Dalhousie University, Truro, NS

Introduction: Functional foods derived from food processing waste offer a sustainable approach to enhancing human health. Grape seeds, a by-product of the grape processing industry, are rich in polyphenols, among which proanthocyanidins (PAC) are the most abundant. However, the bioavailability of highly polymeric PAC is limited.Hypothesis: It is hypothesized that probiotic microorganisms can break down high-polymeric PACs in grape seeds into postbiotics with enhanced bioavailability and potential health benefits.

Objectives: This study aims to biotransform PAC of grape seeds using different microorganisms and characterize their microbial metabolites to assess their potential for functional food development.
Methods: Six bacterial species (Lactobacillus acidophilus, L. casei, L. rhamnosus, L. plantarum, Bifidobacterium animalis, and Akkermansia muciniphila), two yeast species (Saccharomyces cerevisiae and S. boulardii), and two edible mushrooms (White Button and Shiitake) were used separately for biotransformation of grape seed powder (GSP). Submerged fermentation was conducted with GSP, while mushrooms were also used for solid-state fermentation. Samples were collected at defined intervals for analysis of total phenolic content, total PAC, and metabolites using high-performance liquid chromatography-mass spectrometry (HPLC-MS).

Results: HPLC-MS analysis revealed that microbial biotransformation led to the production of metabolites not detected in the initial substrate or microbial control. Additionally, the concentrations of certain compounds in GSP were changed during biotransformation, indicating microbial metabolism.

Discussion: The findings suggest that selected microorganisms effectively biotransform grape seed polyphenols, generating novel bioactive metabolites.

Conclusion: This biotransformation may enhance the bioavailability and functional properties of grape seed polyphenols, allowing their potential use in functional food applications.

Mots clés : Biotransformation, Functional food, Grape seeds

Abstract #2 – Oral, G

Chaga mushroom and microalgae reduce chemically induced acute lung injury in mice

Madumani Amararathna[1], H. P. Vasantha Rupasinghe[1, 2, 3]

[1]Department of Plant, Food, and Environmental Sciences, Faculty of Agriculture, Dalhousie University, Truro, NS B2N 5E3, Canada, [2]Department of Pathology, Faculty of Medicine, Dalhousie University, Halifax, NS B3H 4H7, Canada., [3]Beatrice Hunter Cancer Research Institute, Halifax, NS B3H 4R2, Canada

Introduction: Chaga mushroom and marine microalgae have long been recognized as remarkable functional foods and dietary supplements for a variety of human diseases and conditions. Both are rich in bioactive compounds that can help promote health and treat ailments. Their therapeutic potentials against acute lung injury (ALI) are not fully elucidated. Frequent inhalation of toxic chemical substances can lead to severe lung inflammation, resulting in ALI, which is associated with high morbidity and mortality rates. The development of novel dietary strategies having minimal side effects is of utmost important to improve lung health and reduce the disease burden.

Objective: This study aims to investigate the mechanism of action behind the anti-inflammatory properties of Chaga mushroom and microalgae as dietary supplements in suppressing ALI.

Methods: ALI was induced in A/J mice by administering nicotine-derived nitrosamine ketone (NNK) and lipopolysaccharide (LPS). The antioxidant activity and anti-inflammatory effects were assessed in plasma and lung tissues.

Results: Microalgae supplementation increased plasma antioxidant activity compared to a regular diet. Proinflammatory cytokines, such as interleukin (IL)-6 and tumor necrosis factor-alpha (TNFα), were significantly downregulated in lung tissues of mice fed microalgae and Chaga mushroom. Notably, the incorporation of microalgae alone suppressed IL-6 and TNFα levels, regardless of the presence of Chaga mushroom in the diet. The degree of ALI was assessed by examining the presence of subpleural nodules, lymphocyte and neutrophil infiltrations.

Conclusion: Incorporating both Chaga mushroom and microalgae into the diet reduced ALI at various levels, suggesting their protective effects against chemically induced ALI.

Mots clés : Mushroom, microalgae, dietary supplements, lung, inflammation

Abstract #1 – Oral, G

Formulating a salt premix solution co-fortified with thiamine and iodine

Jessica A. O'Flaherty[1], Matthew B. McSweeney[2], Bohdan L. Luhovyy[1], Kyly Whitfield[1]

[1]Department of Applied Human Nutrition, Mount Saint Vincent University, Halifax, Nova Scotia, Canada, [2]School of Nutrition and Dietetics, Acadia University, Wolfville, Nova Scotia, Canada

Introduction: Salt fortification is a large-scale, cost-effective method for preventing population-wide nutrient deficiencies. Thiamine (vitamin B_1) deficiency is a national public health concern in Cambodia. Salt iodization is already mandated in Cambodia, so co-fortifying salt with both iodine and thiamine could be an efficient solution, especially if existing spray fortification equipment is employed. Thiamine and iodine react unfavourably in solution: Thiamine hydrochloride (ThHCl) lowers pH, leading to discolouration, aromas, and rapid losses of iodine. However, both thiamine and iodine may be stabilized between pH 5-6.

Objective: To explore the viability of various thiamine-iodine premix solutions designed for the spray fortification of salt in Cambodia.

Hypothesis: Food-safe alkalizing agents and buffers will stabilize pH between 5-6, allowing for minimal losses of iodine and thiamine.

Methods: Twenty-four solutions were formulated to achieve pH of 5.5 using potassium iodate (KIO_3) or potassium iodide (KI), ThHCl, sodium acetate, sodium carbonate, sodium citrate tribasic dihydrate, dextrose, sodium hydroxide, and/or carbonate or citrate buffer. All solutions contained a minimum of 30g/L iodine and 78g/L thiamine and were stored at 30°C and 65% humidity for up to 4 weeks. pH and thiamine and iodine concentrations were measured at 0, 6, 12, 24 and 48 hours, and at 1, 2, 3 and 4 weeks, where viable.

Results: No solution maintained target pH throughout storage. Nutrient assessments are forthcoming.

Discussion and Conclusion: Preliminary findings suggest that solutions formulated with ThHCl and KI are more viable than those with KIO_3 for the co-fortification of salt in Cambodia.

Mots clés: Thiamine, iodine, fortification