

2022 AOCS Annual Meeting & Expo

Health and Nutrition Program

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General Health and Nutrition I

HEALTH AND NUTRITION

Chairs: Matthew Picklo, USDA ARS, USA; and Ambria Crusan, St. Catherine University, USA

Monday, May 2, 2022 | 1:25–3:30 p.m. EDT (Atlanta, USA; UTC-4)

Improved Mediterranean diet pattern scores by increasing Omega-3 containing foods in U.S. adult diets. Ambria Crusan*¹, Francine Overcash², ¹*Nutrition and Dietetics, St. Catherine University, United States;* ²*Department of Food Science and Nutrition, University of Minnesota–Twin Cities, United States*

New methods using natural abundance carbon isotope ratio analysis to measure the turnover of docosahexaenoic acid in preclinical models. Richard Bazinet*, *Nutritional Sciences, University of Toronto, Canada*

Wheat bran protects vitamin A from oxidation during storage. Eline Van Wayenbergh*, Niels A. Langenaeken, Imogen Foubert, Christophe M. Courtin, *KU Leuven, Belgium*

Targeting inflammation and mitochondria with dietary linoleic acid for cardiometabolic health—when research comes full circle. Martha A. Belury* (**Ralph Holman Lifetime Achievement Award Winner**), *Nutritional Sciences, Ohio State University, United States*

Omega-3s: How much do we currently know about omega-3 fatty acids?

HEALTH AND NUTRITION

Chairs: Ignacio Vieitez Osorio, Universidad de la República, Uruguay; and Rinat Rivka Ran-Ressler, Nestle Health Science, USA

Monday, May 2, 2022 | 3:55–6 p.m. EDT (Atlanta, USA; UTC-4)

This session highlights recent research related to Omega-3s and the food system; conflicting information about Omega-3s and cardiovascular disease; challenges with Omega-3 dietary recommendations; the role of VLC-FA in skin tissue; and producing bioactive lipids from microalgae.

How does knowledge of omega-3 fatty acids inform the food system? J. Thomas Brenna*, *Pediatrics, Chemistry, Nutrition, University of Texas, United States*

Omega-3 and cardiovascular disease. William S. Williams*, *Fatty Acid Research Institute, United States*

Challenges in proposing omega-3 fatty acid recommendations for the public. Kristina Jackson*, *Research, Omegaquant Analytics, LLC, United States*

Omega-3 fats as pivotal elements integrating neural, immune and sympathetic nervous systems in aggression, depression and consciousness. Joseph Hibbeln*, *Psychiatry and Mental Health, Barton Health, South Lake Tahoe, United States*

Novel n-3 very-long-chain polyunsaturated fatty acids and their potential role in skin tissue. Martina Torrisen*¹, Bente Ruyter², Elisabeth Ytteborg³, Harald Svensen¹, Tone-Kari Østbye⁴, Astrid Nilsson⁴, Iren Stoknes⁵, Gerd Marit Berge⁴, Marta Bou Mira⁶, ¹*Epax, Norway*; ²*Nutrition, Nofima, Norway*; ³*Fish Health, Nofima, Norway*; ⁴*Nofima, Norway*; ⁵*R&D, Epax Norway AS, Norway*; ⁶*Nutrition and Feed Technology, Nofima, Norway*

Bioactive Lipid Mediators

HEALTH AND NUTRITION

Sponsored by K.D. Pharma Bexbach GmbH

Chairs: Philip C. Calder, University of Southampton, UK; and Gerard Bannenberg, GOED Omega-3, USA

Tuesday, May 3, 2022 | 7:25–9:30 a.m. EDT (Atlanta, USA; UTC-4)

The Bioactive Lipid Mediators session includes talks on a nutraceutical approach for preventing and treating Alzheimer's disease; effects of EPA; enzymatically-oxidized lipids; milk fat globules; ALA and T cells; and plasma lipoproteins.

The biosynthesis and action of enzymatically-oxidized lipids during innate immunity and inflammation. Valerie O'Donnell*, *Cardiff University, United Kingdom*

Eicosapentaenoic acid ethyl esters prevent obesity-driven impairments to glucose homeostasis through the biosynthesis of downstream hydroxylated metabolites. Saame (Raz) Shaikh*, Abrar Al-Shaer, Anandita Pal, Ian Carroll, *Nutrition, UNC Chapel Hill, United States*

Enrichment of brain DHA through dietary LPC EPA/ DHA-Potential application for the Alzheimer disease. Sugasini Dhavamani* (***Health and Nutrition Division New Investigator Research Award Winner***), Poorna CR Yalagala, Papasani V. Subbaiah, *Medicine, University of Illinois at Chicago, United States*

α -Linolenic acid metabolism in human CD3⁺ T cells favours oxylipin production over polyunsaturated fatty acid synthesis. Johanna Von Gerichten*¹, Annette Holland², Nicola Irvine², Elizabeth Miles², Philip Calder², Karen Lillycrop³, Graham Burdge³, Barbara Fielding⁴, ¹*Nutritional Sciences, University of Surrey, United Kingdom*; ²*School of Human Development and Health, University of Southampton, United Kingdom*; ³*University of Southampton, United Kingdom*, ⁴*University of Surrey, United Kingdom*

Intact milk fat globules as a dynamic encapsulation matrix for DHA, which *in situ* produces DHA-derived anti-inflammatory lipids. Tana Hernandez Barrueta*¹, Nitin Nitin², Ameer Y. Taha¹, ¹*Food Science and Technology, University of California at Davis, United States*, ²*Food Science and Technology/Biological and Agricultural Engineering, University of California at Davis, United States*

Hydrolysis of hydroxy PUFA GPC of plasma lipoproteins by group IIA, V and X sPLA₂s. Arnis Kuksis*,
University of Toronto, Canada

Panel discussion

Lipids and the Microbiome

HEALTH AND NUTRITION

Chairs: Jeanette Andrade, University of Florida, USA; and Melissa Pérez Santana, Impossible Foods, USA
Tuesday, May 3, 2022 | 9:55–Noon EDT (Atlanta, USA; UTC-4)

The Lipids and Microbiome session features talks on the relationship of gut organisms with branched chain fatty acids; metabolomics pipeline to accelerate the identification of microbiota-dependent metabolites; milk polar lipids and bile acid metabolism; phytosterols and obesity; cholesterol esterase and bioaccessibility; and a high-fat diet and placental function.

The gut microbiome and dietary fatty acids. J. Thomas Brenna*, *Pediatrics, Chemistry, Nutrition, University of Texas, United States*

Creating a metabolomics pipeline for investigating microbiome-host interactions. Shuo Han*,
Microbiology and Immunology, Stanford University School of Medicine, United States

Addition of cholesterol esterase substantially enhances phytosterol ester bioaccessibility in emulsions with different droplet sizes using a standardized *in vitro* digestion model. Abigail Boyd*¹, Joey Talbert¹, Nuria Acevedo², *¹Food Science and Human Nutrition, Iowa State University, United States; ²Griffith Foods, United States*

Lipidomic analysis of TRPC1 Ca²⁺-permeable channel-knock out mouse demonstrates a vital role in placental tissue sphingolipid and triacylglycerol homeostasis under high-fat diet. Michael Bukowski*¹, Brij Singh², James Roemmich³, Kate Larson³, *¹USDA-ARS Beltsville Human Nutrition Research Center, United States; ²Department of Periodontics, UT Health San Antonio, United States; ³USDA-ARS Grand Forks Human Nutrition Research Center, United States*

Impact of milk polar lipid supplementation on postprandial bile acid composition. Mélanie Le Barz¹, Cécile Vors², Lydie Humbert³, Emilie Gaudiard³, Patrice Gaborit⁴, Stéphanie Lambert-Porcheron⁵, Lemlih Ouchchane⁶, Hubert Vidal⁷, Corinne Malpuech-Brugère⁸, Dominique Rainteau⁹, Marie-Caroline Michalski*², *¹CarMeN laboratory, UCBL1, France; ²INRAE, Carmen Laboratory, UMR1397, France; ³Biochemistry, Laboratory of Biomolecules, Sorbonne University, France; ⁴Dairy Technology, Actalia, France; ⁵Hospices Civils de Lyon, France; ⁶Unité de Biostatistique-Informatique Médicale, Université Clermont Auvergne, CHU de Clermont-Ferrand, France; ⁷CarMeN laboratory, INSERM, France; ⁸UMR 1019 UNH, UFR de Médecine & Des Professions Paramédicales, University of Clermont Auvergne, France; ⁹Biochemistry, Sorbonne University, France*

Anti-obesity potential of 4,4-dimethylsterols by inhibiting pancreatic lipase. Tao Zhang*¹, Xingguo Wang², *¹Jiangnan University, Netherlands; ²Jiangnan University, China (People's Republic)*

Panel discussion

The Role of Lipids and Related Nutrients in Companion Animal Health

HEALTH AND NUTRITION

Chairs: Elaine Krul, EKSci, LLC, USA; and Christine Rogers-Kelly, Mississippi State Chemical Lab, USA
Tuesday, May 3, 2022 | 3:55–6 p.m. EDT (Atlanta, USA; UTC-4)

This session covers topics such as nutrition and inflammation; choline and obesity prevention; benefits of MCT oil; pancreatitis in dogs; and the demand for nutritional pet food.

Nutritional opportunities to advance companion animal health—focus on lipids and related nutrients.

Elaine S. Krul*, *EKSci, LLC, United States*

An investigation into the effect of high fat and carbohydrate diets on a range of biomarkers associated with pancreatitis in dogs.

David G. Thomas*¹, Mark Roberts², Wayne Young³, David Thomas⁴, Emma Bermingham³, ¹*School of Agriculture & Environment, Massey University, New Zealand*; ²*Nutritional Instinct Consultancy Services LLC, United States*; ³*AgResearch Ltd, New Zealand*; ⁴*School of Veterinary Science, Massey University, New Zealand*

Technologies utilizing MCT oil for canine health.

Christina Germain*, Yuanlong Pan, Hui Xu, Sandeep Bhatnagar, Brian Zanghi, Brian Larson, Asa Gore, *Nestle Purina Petcare, United States*

Bioactive lipids and related nutrients in companion animal and poultry diets for reducing inflammation and improving immunity.

Elizabeth Bobeck*, *Animal Science, Iowa State University, United States*

Dietary choline in feline nutrition and its role in obesity prevention and liver health.

Adronie Verbrugghe*, Alexandra Rankovic, *Ontario Veterinary College, University of Guelph, Canada*

General Health and Nutrition II

HEALTH AND NUTRITION

Chairs: Douglas Bibus, Lipid Technologies, LLC, USA; and Rotimi Aluko, University of Manitoba, Canada
Wednesday, May 4, 2022 | 9:55 a.m.–Noon EDT (Atlanta, USA; UTC-4)

Novel antihypertensive and anticholesterolemic peptides from peptic hydrolysates of camel whey proteins. Waqas Baba* (*Health and Nutrition Division Student Award Winner*), Sajid Maqsood, *UAE University, United Arab Emirates*

Development of a method for separation of geometric isomers of alpha-linolenic acid in human plasma by silver ion HPLC and GC-NCI-MS. Na Wei*, Heather C. Kuiper, Enada Archibold, Grace Jairo, Hubert W. Vesper, *NCEH, DLS, Center for Disease Control, United States*

Associations between n-3 fatty acid status and depressive symptoms in Swiss adolescents with and without diagnosed paediatric major depressive disorder: A case-control study. Ester Osuna*¹, Isabelle Herter-Aeberli¹, Sophie Emery², Mona Albermann², Noemi Baumgartner², Michael B. Zimmermann¹, Isabelle Häberling², Gregor Berger², Jeannine Baumgartner¹, ¹*ETH Zurich, Laboratory of Human Nutrition, Switzerland*; ²*University Hospital Zurich, Clinics for Child and Adolescent Psychiatry, Switzerland*

The essentiality of a healthy dietary pattern across the lifespan for reducing the global burden of cardiovascular disease. Penny Kris-Etherton*, *Department of Nutritional Sciences, The Pennsylvania State University, United States* (*Supelco AOCS Research Award Winner*)

Health and Nutrition Poster Session

Chairs: Hongbing Fan, University of Alberta, Canada; and Fang Xia, Pharmavite LLC, USA

H&N-01 Biological Activities of Flaxseed Peptides (Linusorbs). Youn Young Shim*¹, Timothy Tse², Martin J. Reaney², ¹*Department of Plant Sciences, University of Saskatchewan, Canada;* ²*University of Saskatchewan, Canada*

H&N-02 Changes in energy metabolism induced by PFOS and dietary oxylipins. William A. Evans*, Jazmine Eccles, William S. Baldwin, *Biological Sciences, Clemson University, United States*

H&N-03 Dietary γ -glutamyl valine in reducing inflammation in endothelial cells and in a mouse model for Atherosclerosis. Snigdha Guha*, Kaustav Majumder, *Food Science and Technology, University of Nebraska, Lincoln, United States*

H&N-04 Eco-designed virgin coriander seed oil: A food supplement solution to soothe sensitive skin. Regis Marchand*, Catherine Kern, Remi Laville, Alicia Roso, *Research and Innovation, Seppic, France*

H&N-05 Enhancing soybean meal demand and market by developing soy meal based aquafeeds. Zachary Shea*¹, Bo Zhang², ¹*Virginia Tech University, United States;* ²*School of Plant and Environmental Sciences, Virginia Tech, United States*

H&N-06 Fungal digestive enzymes promote macronutrient hydrolysis in the INFOGEST *in vitro* simulation of digestion. Justin L. Guice*¹, Caroline H. Best¹, Morgan D. Hollins¹, Kelly M. Tinker¹, Sean M. Garvey², ¹*Research and Development, BIO-CAT, Inc., United States;* ²*BIO-CAT, Inc., United States*

H&N-07 Fungal multi-enzyme blend promotes improved macronutrient hydrolysis of mixed meal substrates in the INFOGEST *in vitro* simulation of digestion. Justin L. Guice*¹, Morgan D. Hollins¹, Caroline H. Best¹, Kelly M. Tinker¹, Sean M. Garvey², ¹*Research and Development, BIO-CAT, Inc., United States;* ²*BIO-CAT, Inc., United States*

H&N-08 Lipid oxidation kinetics of model systems representative of follow-on formulas. Mathilde Cancalon*¹ (**European Section Student Travel Grant Winner**), Nathalie Barouh¹, Youna Hemery², Erwann Durand³, Pierre Villeneuve¹, Claire Bourlieu-Lacanal⁴, ¹*CIRAD, France;* ²*IRD, France;* ³*CIRAD/UMR QUALISUD, France;* ⁴*UMR IATE, INRAE/Univ Montpellier/Institut Agro, France*

H&N-09 In-vitro bioaccessibility and antioxidant activity of commercial standard and enriched whole egg compounds modulated by production and processing practices. Emerson Nolasco*¹, Eugene Baraka², Danh C. Vu², Sophie Alvarez², Kaustav Majumder¹, ¹*Food Science and Technology, University of Nebraska-Lincoln, United States;* ²*University of Nebraska-Lincoln, United States*

H&N-10 Comparing physical stability of ultrasound and Pickering emulsion fortified with vitamin D. Sibel Uluata*¹, Seymanur Avci², Gokhan Durmaz², ¹*Food Engineering, Inonu University, Turkey;* ²*Inonu University, Turkey*

H&N-11 Diet-induced gene expression changes of cachectic muscle, adipose, and liver. Austin Angelotti*¹, Rachel Cole¹, Amy Webb¹, Maciej Pietrzak¹, Martha A. Belury², ¹*Ohio State University, United States;* ²*Nutritional Sciences, Ohio State University, United States*

H&N-12 Dietary intakes of trans fatty acids in the Canadian population before the prohibition of partially hydrogenated oils. Isabelle Demonty*¹, Kuan Chiao Wang², Isabelle Rondeau², Chantal Martineau³, Lindsay Lukeman³, Dominique Ibanez², ¹*Nutrition Research Division, Bureau of Nutritional Sciences, Health Products and Food Branch, Health Canada, Canada;* ²*Bureau of Food Surveillance and Science Integration, Health Products and Food Branch, Health Canada, Canada;* ³*Nutrition Regulations and Standards Division, Bureau of Nutritional Sciences, Health Products and Food Branch, Health Canada, Canada*

H&N-13 Eco-friendly strategies to produce bioactive lipids from the omega-3 rich microalga *Nannochloropsis gaditana*. Natalia Castejón*, *Department of Food Chemistry and Toxicology, University of Vienna, Austria*

H&N-14 Effect of food emulsions on the cytotoxicity of 3-chloropropane-1,2-diol esters. Ayse Nur Akpınar*¹, Selvi Secil Sahin², Büşra Moran Bozer³, Aziz Tekin¹, Cansu Ekin Gumus-Bonacina¹, ¹*Ankara University, Turkey*; ²*University of Leeds, United Kingdom*; ³*Hitit University, Turkey*

H&N-15 Effects of palm stearin and palm olein emulsion crystallinity on beta-carotene degradation and *in vitro* bioaccessibility. Jessica Ulbikas*, Ye Ling Li, Amanda J. Wright, *Human Health & Nutritional Sciences, University of Guelph, Canada*

H&N-16 Genotoxicity evaluation of prickly pear cactus seeds oil in cultured V79 cells. Ghanya Al-Naqeb*

H&N-17 Medium-chain fatty acids for the prevention or treatment of Alzheimer's disease: A systematic review and meta-analysis. Carolina Castro*¹, Cintia Dias², Hamid Sohrabi¹, Tejal Shah¹, Pratihtha Chatterjee³, Heidi Hillebrandt³, Stephanie Fuller³, Manohar Garg², Ralph Martins³, ¹*Murdoch University, Australia*; ²*The University of Newcastle, Australia*; ³*Macquarie University, Australia*

H&N-18 Nutrition for longevity and healthy aging type. Khalid Elsayed Elsorady*, *Geriatrics and Gerontology, Faculty of Medicine, Ain Shams University, Egypt*