

2018 AOCS Annual Meeting & Expo

May 6–9 | Minneapolis Convention Center | Minneapolis, Minnesota, USA



Lipid Oxidation and Quality (LOQ) Interest Area Tentative Technical Program

As of March 5, 2018

This presentation list is not final and is subject to change.

The presenter is the first author, or the author indicated with an asterisk ().*

Monday Afternoon

LOQ 1a: Lipid Oxidation Fundamentals

Chairs: Fereidoon Shahidi, Memorial University of Newfoundland, Canada; and Weerasinghe Indrasena, DSM Nutritional Products, Canada

Role of Antioxidants and Stability of Frying Oils. S.P.J. Namal Senanayake, *Camlin Fine Sciences, USA*

Impact of Oxidized Proteins and Lipids and Suppression of Atherosclerosis Development by Functional Food Bioactives and Their Metabolites. Jack N. Losso, *Louisiana State University, USA*

Antioxidant Evaluation: Why *in vitro* and *in vivo* Results do not Always Correspond? Fereidoon Shahidi, *Memorial University of Newfoundland, Canada*

Application of Differential Pulse Voltammetry to Determine the Efficiency of Stripping Tocopherols from Commercial Fish Oil. Rachele A. Lubeckyj¹, Jill Moser², and Matthew Phaner^{*3}, ¹*Michigan State University, USA;* ²*USDA, ARS, NCAUR, USA;* ³*University of Michigan-Flint, USA*

LOQ 1b: Optimal Application of Antioxidants in Food with Respect to their Protection Mechanism

Chairs: Xin Tian, Kalsec, Inc., USA; and Thanh Vu, University of Massachusetts Amherst, USA

The Oxidative Stability of Fish Oil Enriched Cow and Soy Milk and the Effect of Adding Rosemary Extract. Xujian Qiu, Charlotte Jacobsen, and Ann-Dorit Moltke Sørensen*, *Technical University of Denmark, Denmark*

Enzymatic Functionalization of Vinyl Phenols and Evaluation of their Resulting Antioxidant Properties in Cell Model Systems. Jérôme Lecomte, Erwann Durand, and Pierre Villeneuve, *CIRAD, France*

Impact of Modified Lecithin on the Antioxidant Activity of alpha-Tocopherol in Bulk Oils. Eric A. Decker and Anuj G. Shanbhag*, ¹*University of Massachusetts Amherst, USA*

Controlling Oxidation in Skin Care Products with Novel Seaweed Antioxidants. Ditte B. Hermund¹, Birgitte R. Thomsen¹, Niruja Sivasubramaniam², Shuk Y. Heung³, Randi Neerup⁴, Louise M. Klinder⁵, Susan Holdt², and Charlotte Jacobsen^{*1}, ¹*Technical University of Denmark, Denmark;* ²*National Food Institute, Technical University of Denmark, Denmark;* ³*DTU Food, Denmark;* ⁴*Danish Technological Institute, Denmark;* ⁵*Mellisa Aps, Denmark*

Tuesday Morning

ANA 2c / LOQ 2a: Evaluation and Prediction of Oxidative Stability and Shelf-life

Chairs: Min Hu, DuPont Nutrition & Health, USA; and Rick Della Porta, Frito-Lay, USA

The Combination of High Oleic Oils and Natural Antioxidants as a Powerful Tool for Shelf Life Extension.

Susan Knowlton, DuPont Company, Pioneer, USA

The Antioxidative Activity of Soluble Bound Phenolic Compounds Fractions Extracted from Germinated Chickpea in Oil-in-Water Emulsions.

Minwei Xu and Bingcan Chen, North Dakota State University, USA

Antioxidant Activities of Sugars and Protein in Low Moisture Cracker System.

Thanh P. Vu, Lili He, D. Julian McClements, and Eric A. Decker, University of Massachusetts Amherst, USA

Oxidative Stability of Margarines, Shortenings and Spreads.

Min Hu, DuPont Nutrition & Health, USA

Shelf-life Extension of Meat and Meat Products by Using Natural Antioxidants.

Henna F.S. Lu, Kalsec Europe Ltd, UK

Differential Stability of Linoleic Sun, Soy and Rapeseed Oils Using TBHQ and Rosemary in Fried Potatoes.

Richard Della Porta, Frito-Lay, USA

ANA 2d / LOQ 2b: Sensory Analytics and Analytical Methods for Assessing Lipid Oxidation and Shelf-life

Chairs: Jian Kong, Abbott Nutrition, USA; and Rick Della Porta, Frito-Lay, USA

Assessing Virgin Olive Oil Stability and Shelf Life at Moderate Conditions by FTIR Spectroscopy Endowed with a Mesh Cell Accessory.

*Noelia Tena¹, Ramón Aparicio-Ruiz¹, Ana Lobo¹, María Teresa Morales², Aparicio Ramón¹, and Diego L. García González*¹, ¹Instituto de la Grasa (CSIC), Spain; ²University of Seville, Spain*

Antioxidant Efficacy and Impact of Storage Conditions.

*Marie Shen¹, Lan Ban¹, and Chandra Ankolekar*², ¹Kemin Food Technologies, USA; ²Kemin Industries Inc., USA*

Sensory Directed Chemical Analysis of Oxidized Marine Oils.

Roy D. Desrochers, Tufts University Sensory and Science Center, USA

Developing a Sensory Oxidation Quality Scale.

Monica L. Godbout, Abbott Nutrition, USA

Tuesday Afternoon

LOQ 3a / PRO 3.2a: Effect of New Processing Technologies on Lipid Oxidation

Chairs: David Johnson, Kalsec Inc., USA; and Antonios Papastergiadis, Desmet Ballestra, USA

Oxidative Stability of Tomato-based Matrices Enriched with n-3-LC-PUFA Derived from Microalgae.

Lore Gheysen¹, Nele Lagae², Jolien Devaere³, Koen Goiris⁴, Luc De Cooman⁴, and Imogen Foubert¹, ¹Katholieke Universiteit Leuven Kulak, Belgium; ²KU Leuven University KULAK, Belgium; ³KU Leuven Technology Campus Ghent, Belgium; ⁴Katholieke Universiteit Leuven, Technology Campus Ghent, Belgium

Oxidation and Hydrolysis of Lipids in Marine Edible Shellfishes During Hot Drying Process.

Dayong Zhou¹, Zhongyuan Liu², Kaiqi Gang³, Fereidoon Shahidi⁴, and Tong Wang⁵, ¹Dalian Polytechnic University, China; ²College of Food Science & Technology, Dalian Polytechnic University, China; ³School of Food Science and Technology,

Dalian Polytechnic University, China; ⁴Memorial University of Newfoundland, Canada; ⁵Iowa State University, USA

Effect of Spray-Dried Flavonoid Microparticles on Oxidative Stability of Methyl Linoleate as Lipid Model System. Manuel J. Palma¹, Gloria Márquez-Ruiz², Paula García³, Francisca Holgado⁴, Cristina Vergara³, Begoña Giménez⁵, and Paz S. Robert¹, ¹*Universidad de Chile, Chile; ²Instituto de Ciencia y Tecnología de Alimentos y Nutrición (ICTAN-CSIC), Spain; ³Departamento de Ciencia de los Alimentos y Tecnología Química, Facultad de Ciencias Químicas y Farmacéuticas, Universidad de Chile, Chile; ⁴Instituto de Ciencia y Tecnología de Alimentos y Nutrición (ICTAN-CSIC); ⁵Departamento de Ciencia y Tecnología de los Alimentos, Facultad Tecnológica, Universidad de Santiago de Chile, Chile*

The Impact of Diacylglycerol on Association Colloids Formation and Lipid Oxidation. Mizue Ouchi¹, Eric A. Decker², and D. Julian McClements², ¹*Kao Corporation, Japan; ²University of Massachusetts Amherst, USA*

EAT 3.1a / LOQ 3b: Manufacture and Stabilization of W/O and O/W Emulsions for Optimal Shelf-life

Chairs: Tanu Tokle, Qualitech, USA; Ann-Dorit Moltke Sørensen, Technical University of Denmark, Denmark; and Chandra Ankolekar, Kemin Industries Inc., USA

Stability and Functionality of Colloidosomes as Delivery Systems for Small Molecules. Umut Yucel, *Kansas State University, USA*

Tocopherol Regeneration by Phospholipids in Soybean Oil-in-Water Emulsion: Effect of Tocopherol Homologue and Emulsifier Type. Gautam Samdani, D. Julian McClements, and Eric A. Decker, *University of Massachusetts Amherst, USA*

Effect of Droplet Size and Interfacial Crystallization on the Rheology of Fat Crystal-stabilized Water-in-Oil Emulsions. Dérick Rousseau and Ruby R. Rafanan, *Ryerson University, Canada*

Label Friendly EDTA Alternative for Oxidative Stability Improvement in Food Emulsions. Lan Ban, Yvonne Gildemaster, and Joan Randall, *Kemin Food Technologies, USA*

Wednesday Morning

LOQ 4a: Lipid Oxidation in Complex Food Products and Interactions with Ingredients

Chairs: Lynn Yao, Mondelēz International Inc., USA, USA; Lan Ban, Kemin Food Technologies, USA; and Will Schroeder, Kemin Food Technologies, USA

Lipid Oxidation in Fish Feed. Ann-Dorit Moltke Sørensen, Anita Ljubic, and Charlotte Jacobsen*, *Technical University of Denmark, Denmark*

The Combination of Green Tea and Rosemary – Impact of System, Concentration and Ratio on Antioxidant Performance. Xin Tian, Nora Yang, and Poulson Joseph, *Kalsec, Inc., USA*

Evaluation of Antioxidants and Antimicrobials from Plant Extracts in Pet Food. Charlotte Deyrieux¹, Erwann Durand¹, Nathalie Barouh¹, Jérôme Lecomte², Françoise Michel-Salaun³, Bruno Baréa¹, Gilles Kergourlay³, and Pierre Villeneuve¹, ¹*CIRAD, France; ²CIRAD, Greece; ³Videka Diana Pet Food, France*

Non-targeted Screening for Oxidized Lipids in Foods. Verena Grüneis¹, Natasa Popovic², Martin Zehl³, Jürgen König⁴, and Marc Pignitter*¹, ¹*Department of Physiological Chemistry, Faculty of Chemistry, University of Vienna, Austria; ²Department of Physiological Chemistry, Faculty of Chemistry, University of Vienna, Austria;*

³Department of Analytical Chemistry, Faculty of Chemistry, University of Vienna, Austria; ⁴Department of Nutritional Sciences, Faculty of Life Sciences, University of Vienna, Austria

Polyphenol Shifts in Lipid Oxidation Pathways and Interactions with Proteins Alter Apparent Antioxidant Effectiveness. Karen M. Schaich, and Xiaosong Chen², ¹Dept. of Food Science, Rutgers University, USA; ²China Agricultural University, China

EAT 4.1 / LOQ 4b: Food Structuring to Reduce Lipid Oxidation

Chairs: Hong-Sik Hwang, USDA, ARS, NCAUR, USA; Alex Kripps, Caldic USA, USA; and Yaqi Lan, South China Agriculture University, China

Formation of Free-flowing Fish Oil-loaded Hollow Solid Lipid Micro- and Nanospheres Using Carbon Dioxide. Junsi Yang and Ozan N. Ciftci*, University of Nebraska-Lincoln, USA

Natural Wax Oleogels-A Method to Prevent Oxidation of Fish Oil. Hong-Sik Hwang¹, Matthew Phaner², Jill Moser¹, and Sean Liu³, ¹USDA, ARS, NCAUR, USA; ²University of Michigan-Flint, USA; ³USDA, ARS, USA

Self-assembled Colloidal Complexes of Polyphenol–gelatin and their Stabilizing Effects on Emulsions. Chaoying Qiu, Yu Huang¹, Zhen Zhang², Ying Li³, and Yong Wang¹, ¹Jinan University, China; ²South China University of Technology, China; ³Guangdong Saskatchewan Oilseed Joint Laboratory, Dept. of Food Science and Engineering, Jinan University, China

Ability of SDS Micelles to Increase the Antioxidant Activity of α -tocopherol. Raffaella Inchingolo¹, Sezer S. Kiralan¹, Sibel Uluata¹, MariaTeresa Rodriguez Estrada², D. Julian McClements³, and Eric A. Decker⁴, ¹University of Massachusetts, USA; ²University of Bologna, Italy; ³University of Massachusetts, Amherst, USA; ⁴University of Massachusetts Amherst, USA

Impact of Reduced Oxygen Environment and Natural Antioxidants on the Oxidative Stability of Oil-in-Water Emulsions. Eric A. Decker¹, and David R. Johnson^{*2}, ¹University of Massachusetts Amherst, USA; ²Kalsec Inc., USA

Wednesday Afternoon

LOQ 5a: Oxidation By-products in Food and Feed: Impact on Nutritional Value and Metabolic Processes

Chairs: S.P.J. Namal Senanayake, Camlin Fine Sciences, USA; and Constantin Bertoli, Nestle Product Technology Center, Switzerland

Nutritional Impacts of Oxidation Byproducts in Food: The Pet Food Dilemma. Megan E. Morts and Greg Aldrich, Kansas State University, USA

Dietary Intake of Mildly Oxidized Fat Increases Colitis and Colitis-associated Colon Tumorigenesis through Activation of Toll-like Receptor 4 (TLR4) Signaling. Weicang Wang, Yuxin Wang, Eric A. Decker, and Guodong Zhang*, University of Massachusetts Amherst, USA

Implications of Feeding Peroxidized Lipids in Swine. Brian Kerr, USDA-ARS, USA

Food-induced Formation of Health-damaging Compounds during Repeated Deep-fat Frying Cycles. Ru Shen, William G. Helferich, and Nicki J. Engeseth, University of Illinois at Urbana-Champaign, USA

LOQ 5b: Lipid Oxidation and Quality General Session

Chair: Jill Moser, USDA, ARS, NCAUR, USA

Synergism and Antagonism of Phenolic, Amine and Sulfur-containing Antioxidants in Lipid Oxidation. Olga T. Kasaikina and Karina M. Zinatullina² *Semenov N.N. Institute of Chemical Physics, Russia*

Physical and Oxidative Stability of O/W Emulsions Stabilized by Gum Arabic Glycated Pea Proteins. Bingcan Chen¹ and Fengchao Zha*², ¹*North Dakota State University, USA*

Oxidative Stability of Flaxseed Oil: Effect of Polar, non-Polar and Surface-active Antioxidants. Athira Mohanan, Michael Nickerson, and Supratim Ghosh, *University of Saskatchewan, Canada*

Antioxidant and Antibacterial Activity of Different Extracts from Herbs Obtained by Maceration or Supercritical Technology. Ignacio Vieitez, Lucía Maceiras, Iván Jachmanián, and Silvana Alborés, *UdelaR, Uruguay*

LOQ-P: Lipid Oxidation and Quality Poster Session

Chair: Uwe Nienaber, DSM Nutritional Products, USA

Study of the Impact of Heating Pre-treatments and Solvent on Ultrasound Extraction of Hemp Phenolics. Erika Zago¹, Ruchira Nandasiri¹, Jingbang Liang¹, Peter Eck¹, Michael Eskin¹, Rabie Khattab², and Usha Thiyam¹, ¹*University of Manitoba, Canada*; ²*Alexandria University, Egypt*

Impact of High Pressure and Temperature Processing on Antioxidant Activity of Canola Meal Extracts. Ruchira Nandasiri, Erika Zago, and Usha Thiyam, *University of Manitoba, Canada*

Chemometric Comparison of Aldehyde Formation in Olive Oil and Camellia Oil at Frying Temperature. Ling Peng, Jieyao Yuan*, and Chi Chen, *University of Minnesota, USA*

Chemometric Profiling of Aldehyde Distribution in Frying Oil and French Fries. Lei Wang, Yuyin Zhou*, Yukari Yamashita, and Chi Chen, *University of Minnesota, USA*

Development of Novel Free-flowing Fish Oil-loaded Hollow Solid Lipid Micro- and Nanoparticles to Improve Oxidative Stability of Fish Oil. Junsi Yang and Ozan N. Ciftci, *University of Nebraska-Lincoln, USA*

Physical and Oxidative Stability of 50-70% Fish Oil-in-Water Emulsions Stabilized with Sodium Caseinate and Phosphatidylcholine. Betül Yesiltas¹, Ann-Dorit Moltke Sørensen², Pedro J. Garcia-Moreno², and Charlotte Jacobsen*², ¹*National Food Institute, Technical University of Denmark, Denmark*; ²*Technical University of Denmark, Denmark*

Identification and Quantification of Phytoprostanes and Phytofurans in Coffee and Cocoa By- and Co-products. Mariana Ruesgas Ramon¹, Claire Vigor², Amandine Rocher², Guillaume Reversat³, Joseph Vercauteren³, Camille Oger³, Jean-Marie Galano³, Thierry Durand³, Erwann Durand⁴, and Maria Cruz Figueroa-Espinoza⁵, ¹*SupAgro Montpellier, France*; ²*Institut des Biomolécules Max Mousseron, France*; ³*Institut des Biomolécules Max Mousseron, UMR 5247 CNRS, University of Montpellier, ENSCM, Faculty of Pharmacy., France*; ⁴*CIRAD, France*; ⁵*Montpellier SupAgro, UMR IATE, Montpellier, France*

An Investigation of the Antioxidant Activity of Alkyl Gallates in Model Membranes. Yu Zhao¹, Drew Marquardt², Ryan J. Elias¹, and John N. Coupland¹, ¹*Pennsylvania State University, USA*; ²*University of Windsor, Canada*

Predicting the Oxidative Stability in Bakery Products: Application of Accelerated Method Based on Oxygen Consumption. Claudio Corradini¹, Antonella Cavazza¹, Emma Chiavaro², Carmen Lagana³, Stefano Casiraghi*⁴, Monia Scarsi⁴, Maria Paciulli⁵, Massimiliano Rinaldi⁵, and Maria Grimaldi⁶, ¹*Università degli Studi di Parma, Italy*; ²*Dipartimento di Scienze degli Alimenti e del Farmaco, Università di Parma, Italy*; ³*VELP Scientifica, Italy*; ⁴*VELP Scientific, Inc., USA*; ⁵*Dipartimento di Scienze degli Alimenti e del Farmaco, Università di Parma, Italy*; ⁶*Dipartimento di Scienze Chimiche, della Vita e della Sostenibilità Ambientale, Università di Parma, Italy*

A Study of Photooxidation in Edible Oils by FTIR Spectroscopy and Incubation at Moderate Light Intensity. Noelia Tena¹, Ramón Aparicio-Ruiz¹, Ana Lobo², María Teresa Morales³, Aparicio Ramón², and Diego L. García González*¹, ¹*Instituto de la Grasa (CSIC), Spain*; ²*Instituto de la Grasa (CSIC)*; ³*University of Seville, Spain*

Food-induced Formation of Health-damaging Compounds During Repeated Deep-fat Frying Cycles. Ru Shen¹, William G. Helferich², and Nicki J. Engeseth², ¹*University of Illinois, USA*; ²*University of Illinois at Urbana-Champaign, USA*

Lecithin Near Critical Micelle Concentration had the Highest Oxidative Stability in Corn Oil. JiSu Kim¹, YunSik Woo¹, Jiwon Ryu¹, MiJa Kim², and JaeHwan Lee*³, ¹*Sungkyunkwan University, Republic of Korea*; ²*Kangwon National University, Republic of Korea*; ³*Dept. of Food Science and Biotechnology, Sungkyunkwan University, Republic of Korea*

Optimization and Validation of Rancimat Operational Parameters to Determine Walnut-oil Oxidative Stability. Lucia Felix and Irwin R. Donis-Gonzalez, *University of California-Davis, USA*

Correlation between Phenolic Compounds and Antioxidant Activity of Sapucaia Nut (*Lecythis pisonis* Cambess) Aqueous Extract. Fernanda Demolinder¹, Priscila Policarpi², Leticia Turcatto², Luciano Vitali³, Gustavo A. Micke³, and Jane Mara Block*⁴, ¹*Dept. of Food Science and Technology -Federal University of Santa Catarina, Brazil*; ²*Dept. of Food Science and Technology, Federal University of Santa Catarina, Brazil*; ³*Department of Chemistry - Federal University of Santa Catarina, Brazil*; ⁴*UFSC, Brazil*

Microwave-assisted Synthesis and Antioxidant Activity of Palmitoyl-epigallocatechin Gallate. Tao Zhang, Ruijie Liu, Ming Chang, Qingzhe Jin, and Xingguo Wang, *Jiangnan University, China*

Comparison of Walnut Oil Obtained by Different Extraction Solvents. Pan Gao and Xingguo Wang, *Jiangnan University, China*

Co-solvent Modified Supercritical Carbon Dioxide Extraction and Antioxidant Activity of Rosemary Extracts. Ignacio Vieitez, Lucía Maceiras, and Iván Jachmanián, *UdelaR, Uruguay*

Opportunities for Low Saturate High Oleic Canola Oil in Food Industry: Frying Quality and Oxidative Stability. Xiaolan Luo and Diliara Iassonova, *Cargill Inc., USA*

The Degraded Products During Frying. Junmei Liang, Yuan Rong Jiang, and Wenyan Ji, *Wilmar (Shanghai) Biotechnology Research & Development Center Co., Ltd, China*

Radical Detection in Antioxidant Treated Fish Oil using Electron Paramagnetic Resonance. Ewa Szajna-Fuller, Carrie Wray*, and Qing Bin, *Kemin Industries, USA*