

Exponent®
Engineering & Scientific Consulting

Kelly Higgins, Ph.D., MPH

Managing Scientist | Chemical Regulation and Food Safety
Denver
+1-202-772-4940 | khiggins@exponent.com

Professional Profile

Kelly Higgins is a clinical nutrition scientist with ten years of experience evaluating complex relationships between diet, behavior, and health. Dr. Higgins' is an ingestive behavior expert, with specialized experience investigating the multidisciplinary study of why people eat what they eat, when they eat it, and how this affects health. Her technical skills include experimental design and management of clinical trials, biostatistics, dietary exposure assessment, and systematic review methodology. She has applied these skills to aid clients in the development of clinical trial protocols, assessments of food and nutrient consumption patterns of nationally representative populations, and critical reviews of health benefits and risks of dietary exposures.

Prior to Exponent, Dr. Higgins was a Nutrition Scientist at the U.S. Department of Agriculture, Agricultural Research Service, Beltsville Human Nutrition Research Center, Food Components and Health Laboratory (FCHL). In this role, Dr. Higgins' conducted clinical research investigating the effect of sensory properties and palatability of the diet on body composition and ingestive behavior. Dr. Higgins led initiatives to design and commence multiple controlled feeding randomized controlled trials. In addition, she co-led a USDA-NIFA workshop to convene experts in nutrition, food science, and epidemiology from government, academia, and industry to develop a Research Roadmap to identify priorities for investigating effects of ultra-processed food on risk for obesity and cardiometabolic diseases. This roadmap informed the FCHL five-year plan to study how characteristics of ultra-processed foods (UPF) affect ingestive behavior and diet-related chronic disease risk.

Dr. Higgins has experience analyzing nationally representative dietary intake data, including data collected as part of the National Health and Nutrition Examination Survey (NHANES), to conduct health hazard evaluations and to assess nutrient adequacy. Her data analysis expertise expanded Exponent's capability to conduct probabilistic exposure assessments and analyze usual food and nutrient intake.

In line with her interest in energy balance and obesity, she led numerous systematic reviews to synthesize evidence and draw conclusions of various complex diet and body-weight related outcomes, including the reviews focused on sweetness, low calorie sweeteners, portion size, ingestive frequency, and chrononutrition.

Academic Credentials & Professional Honors

M.P.H., Public Health, Purdue University, 2018

Ph.D., Food Science, Purdue University, 2018

B.S., Nutritional Sciences, Biochemistry, University of Missouri, Columbia, 2014

Achievement Award, U.S. Department of Agriculture, Agricultural Research Service, 2022

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Excellence Award, Exponent Inc., 2019

Certificate of Excellence in Research Award, Purdue University, 2018

Mentored Platform Presenter Award, Federation of American Societies for Experimental Biology, 2018

Rose Marie Pangborn Sensory Scholarship, 2017

Prior Experience

Research Nutritionist, U.S. Department of Agriculture (USDA), Agricultural Research Service (ARS), Beltsville Human Nutrition Research Center (BHNRC), 2021 – 2023

Senior Scientist, Exponent Inc., 2020 – 2021

Scientist, Exponent Inc., 2019 – 2020

Professional Affiliations

Institute of Food Technologists, Washington DC Section Board Member, August 2019 – August 2025

Institute of Food Technologists, Member, 2012 – Present

American Society for Nutrition, Member, 2015 - Present

Purdue University Ingestive Behavior Research Center, Executive Committee Member, 2016 – 2018

Publications

Ayoub-Charette S, Nguyen M, Chiavaroli L, Mattes R, de Souza R, Khan T, Higgins K, Saxena N, MacKay D, Panahi S, Sievenpiper J, Malik V. "Low- and no-calorie sweeteners and health: unravelling the evidence and controversy," Applied Physiology, Nutrition, and Metabolism, 2026 Jan 1, 51, 1-11. DOI: 10.1139/apnm-2025-0440

Scrafford C, Davis B, Higgins K, Moynihan E, Morris-Schaffer K, Anderson M, Rackl S, Hearon S, Davis D. Estimated long-term dietary exposure to cadmium from consumption of spinach in the United States: a probabilistic assessment. Food Chem Toxicol. 2025 Jan 22; 197:115269. doi: 10.1016/j.fct.2025.115269.

Higgins K, Rawal R, Kramer M, Baer D, Yerke A, Klurfeld D. An overview of reviews on the association of low calorie sweetener consumption with body weight and adiposity. Advances in Nutrition 2024 Aug 8; 100239. doi: 10.1016/j.advnut.2024.100239.

O'Connor S, O'Connor L, Higgins K, Bell B, Krueger E, Rawal R, Hartmuller R, Reedy J, Shams-White M. Conceptualization and assessment of 24hr timing of eating and energy intake: a methodological systematic review of the chronic disease literature. Advances in Nutrition 2024. https://doi.org/10.1016/j.advnut.2024.100178.

O'Connor L, Higgins K, Smiljanec K, Bergia R, Brown A, Baer D, Davis C, Ferruzzi M, Miller K, Rowe S, Rueda J, Andres A, Cash S, Coupland J, Crimmins M, Fiecke C, Forde C, Fukagawa N, Hall K, Hamaker B, Herrick K, Hess J, Heuven L, Juul F, Malcomson F, Martinez-Steele E, Mattes R, Messina M, Mitchell A, Zhang F. A research roadmap about processed foods, food processing, and human health in the context of the US food system: Proceedings from an interdisciplinary workshop. Advances in Nutrition 2023 Sep 16; S2161-8313(23)01378-9.

Ye Q, Devarshi P, Grant R, Higgins K, Mitmesser S. Lower intakes of key nutrients are associated with more school and workplace absenteeism in US children and adults: a cross-sectional study of NHANES 2003-2008. Nutrients 2023 Oct 13; 15(20):4356. doi: 10.3390/nu15204356.

Higgins K, Rawal R, Baer D, O'Connor L, Appleton K. Scoping review and evidence map on the relationship between exposure to dietary sweetness and body weight-related outcomes in adults. Advances in Nutrition 2022 Dec 22; 13(6):2341-2356.

Higgins K, Bi X, Davis B, Barraj L, Scrafford C, Murphy M. Adequacy of total usual micronutrient intakes among pregnant women in the United States by level of dairy consumption, NHANES 2003-2016. Nutrition and Health 2022 Dec; 28(4):621-631.

Murphy M, Barraj L, Higgins K. Healthy U.S.-style dietary patterns can be modified to provide increased energy from protein. Nutrition Journal 2022 Jun 18; 21(1):39.

Davis B, Bi X, Higgins K, Scrafford C. Gestational health outcomes among pregnant women in the United States by level of dairy consumption and quality of diet, NHANES 2003-2016. Maternal & Child Health Journal 2022 Oct; 26(10):1945-1952.

Higgins K, Hudson J, Hayes A, Braun E, Cheon E, Couture S, Gunaratna N, Hill E, Hunter S, McGowan B, Reister E, Wang Y, Mattes R. Systematic review and meta-analysis on the effect of portion size and ingestive frequency on energy intake and body weight among adults in randomized controlled feeding trials. Advances in Nutrition 2022 Feb 1; 13(1):248-268.

Murphy M, Scrafford C, Barraj L, Bi X, Higgins K, Jaykus LA, Tran N. Potassium chloride-based replacers: modeling effects on sodium and potassium intakes of the US population with cross-sectional data from NHANES 2015–2016 and 2009–2010. American Journal of Clinical Nutrition 2021 Jul 1; 114(1):220-230.

Murphy M, Higgins K, Bi X, Barraj L. Adequacy and sources of protein intake among pregnant women in the United States, NHANES 2003-2012. Nutrients 2021 Feb 28; 13(3):795.

Cowan A, Higgins K, Fisher J, Tripicchio G, Mattes R, Zou P, Bailey R. Examination of different definitions of snacking frequency and associations with weight status among U.S. adults. PLoS ONE 2020 Jun 17; 15(6):e0234355

Higgins K, Barraj L, Reiss R. 2020. Supplemental statistical analysis of organophosphorus (OP) pesticides in vitro inhibition study. EPA Federal Insecticide, Fungicide, and Rodenticide Act Scientific Advisory Panel. Docket ID EPA-HQ-OPP-2020-0263.

McArthur B, Higgins K, Hunter S, and Mattes R. Energetics of nut consumption: oral processing, appetite, and energy balance. Health Benefits of Nuts and Dried Fruits. Chapter. 2020.

Higgins K, Mattes R. A randomized controlled trial contrasting the effects of four low calorie sweeteners and sucrose on body weight in adults with overweight or obesity. American Journal of Clinical Nutrition 2019 May 1; 109(5):1288-1301.

Higgins K, Hunter S, Mattes R. Sensory, gastric, and enteroendocrine effects of carbohydrates, fat, and protein on appetite. Current Opinion in Endocrine and Metabolic Research 2019; 4:14-20.

Higgins K, Considine R, Mattes R. Aspartame consumption for 12 weeks does not affect glycemia, appetite, or body weight of healthy, lean adults in a randomized controlled trial. The Journal of Nutrition 2018; 148(4):650-657.

McArthur B, Higgins K, Hunter S, and Mattes R. Energetics of nut consumption: oral processing, appetite, and energy balance. Health Benefits of Nuts and Dried Fruits 2018.

Running C, James B, Hollis J, Higgins K. Session 3 discussion: the microstructure of eating. Physiology & Behavior 2018.

Wittekind A, Schwarz C, McGale L, Stamataki N, Higgins K, Beauchamp B, Nicklaus S, de Graaf C, Gibson S, Rogers P, Mattes R, McLaughlin J, Dussort P, Marsaux C, Mela D, Halford J, Bonnema A, Macdonald I. A workshop on 'Dietary Sweetness - Is It an Issue?' International Journal of Obesity 2018; 42:934-938.

Carreiro A, Dhillon J, Gordon S, Higgins K, Jacobs A, McArthur B, Redan B, Rivera R, Schmidt L, Mattes R. "Endocrine Responses to Protein." The macronutrients, appetite, and energy intake. Annual Review of Nutrition 2016 Jul 17; 36:73-103.

Leidy H, Hoertel H, Douglas S, Higgins K, Shafer R. 2015. A high□protein breakfast prevents body fat gain, through reductions in daily intake and hunger, in "Breakfast skipping" adolescents. Obesity 2015 Sep; 23(9):1761-4.

Presentations

Higgins K, Oxenham A, Stearn D, Mettler E, Mandernach S. From States to Plates: Coordinating Food Inspections, Recalls, and Outbreak Response. Food & Drug Law Institute (FDLI) Annual Conference, Washington, DC, 2026.

Higgins K, Kaur S, Beckett A. Do sauces and dressings fall under ultra-processed foods? The Association for Dressings & Sauces (ADS) Technical Committee Meeting, Greenville, SC, 2026.

Quiros AM, Higgins K, Slayne M, McClements DJ, Socolovsky S, Schiff H. How can we rethink the future of so-called ultra-processed foods with science in mind? IFT FIRST Scientific & Technical Forum, Chicago, IL, 2025.

Higgins K. The ketogenic potential of tri-betahydroxybutyrin, a ketone tri-ester. 16th Congress for the International Society for the Study of Fatty Acids, Quebec City, Quebec, 2025.

Higgins K. Sweetness: the science and the misconceptions. 2025 World Sugar Research Organisation Annual Meeting, Guadalajara, Mexico, 2025.

Higgins K, Rosales A, Gilbert J. Challenges and research gaps around ultra-processed foods. Congressional Lunch & Learn, Washington, DC, 2025.

Higgins K, Karaken D. Alcohol and ultra-processed foods: understanding the drivers of desire, intake, and "addiction". Institute for Food Technologists Food Policy Impact, Washington, DC, 2025.

Higgins K, Kamil A, Sheth V. Science of sweetness: a review of current evidence and common misconceptions. 2025. https://www.pepsicohealthandnutritionsciences.com/educational-resources/science-sweetness-review-current-evidence-and-common-misconceptions

Higgins K, Brown A, Keitt A, Chiavaroli L, Cowan-Pyle A, Erndt-Marino J, Vorland C. 2024. Lumping and Splitting Dialogue Mapping, Morrilton, AR, 2024.

Higgins K. USDA research on sweetness and sweeteners and sugars. Calorie Control Council (CCC) 2024 Annual Meeting and Educational Symposium, Washington, DC, 2024.

Higgins K. Low- and no-calorie sweeteners and body weight: how systematic reviews produce disparate results. 2024. https://iafns.org/low-no-calorie-sweeteners-what-does-the-science-really-say/

Higgins K. Mechanisms low calorie sweeteners may (or may not) influence energy and glycemic

regulation. Oral Presentation, Canadian Nutrition Society, Non-nutritive Sweetener & Health: Unravelling the Evidence & Controversy, Toronto, ON, 2024.

Higgins K, Jones J, Mattes R, O'Connor L. Ultra-processed foods: current challenges and future directions. Oral Presentation, American Society for Nutrition, Nutrition 2023, Boston, MA, 2023.

Higgins K, Rawal R, Kramer M, Baer D, Klurfeld D. An overview of reviews on the association of low calorie sweetener consumption with body weight and adiposity. Poster, American Society for Nutrition, Boston, MA. 2023.

Higgins K, de Graaf K. Dietary sweetness & body weight: what do we know and where do we go from here? Webinar, 2023. https://iafns.org/event/dietary-sweetness-and-body-weight/

Higgins K, Dawson H, Rhodes D, McKillop K, Fukagawa N. Sources and intake of added sugars in the US diet. Webinar, IAFNS-USDA Beltsville Webinar Series, 2022. https://iafns.org/event/iafns-usda-beltsville-webinar-series/

Higgins K, Rawal R, Baer D, O'Connor L, Appleton K. Evidence map on the relationship between exposure to dietary sweetness and body weight-related outcomes in adults. Poster, American Society for Nutrition, Nutrition 2022, Virtual Conference, 2022.

Morton S, Rhodes D, Higgins K, Moshfegh A. Increased adherence to added sugars recommendation among Americans, what we eat in America, NHANES, 2005-2008 and 2015-2018. Poster, American Society for Nutrition, Nutrition 2022, Virtual Conference, 2022.

O'Connor L, Higgins K, Herrick K. Estimating lean and non-lean oz-equivalents of red meat and poultry using the USDA's food patterns equivalents database. 42nd Annual National Nutrient Databank Conference, Virtual Conference, 2022.

Higgins K. New job 101: job search strategies, networking and interview tips for aspiring professionals. Nutrition 2021 Live Online, Virtual Conference, 2021.

Higgins K, Reiss R, Chambers J, Lennox K. OP In vitro Inhibition program: introduction to testing program – statistical analysis of data. EPA Federal Insecticide, Fungicide, and Rodenticide Act Scientific Advisory Panel. Docket ID EPA-HQ-OPP-2020-0263.

Higgins K, Mattes R. A randomized controlled trial contrasting the effects of four low calorie sweeteners and sucrose on body weight in adults with overweight or obesity. International Life Sciences Institute (ILSI), Webinar, 2018.

Higgins K. Twelve week consumption effects of five sweeteners on body weight, energy intake, and energy expenditure. Oral prestation, Nutrition 2018, Boston, MA, 2018.

Higgins K. Farmer to farmer household soy processing in Mikumi, Tanzania. Oral presentation, Catholic Relief Services Brown Bag Series, Baltimore, MD. 2016.

Higgins K. TZ36 soy processing. Oral presentation, Catholic Relief Services, Dar es Salaam, Tanzania. 2015.

Project Experience

Utilized deterministic and probabilistic methods to assess exposure to food components, nutrients, and contaminants as part of health hazard evaluations and regulatory submissions to the FDA.

Led an interdisciplinary team of scientists to develop a dietary exposure assessment software incorporating dietary data collected as part of NHANES and data from the National Eating Trends survey.

Steered the development of the Food Components and Health Laboratory 5-year plan to study food processing characteristics affect ingestive behavior and risk of diet-related chronic diseases.

Co-led a USDA-NIFA workshop to convene experts in nutrition, food science, and epidemiology from government, academia, and industry to develop a Research Roadmap to identify priorities for investigating effects of ultra-processed food on risk for obesity and cardiometabolic diseases.

Designed and managed a NIH-funded 7-month controlled feeding randomized controlled trial of over 90 participants to investigate diet-induced modification of sweet taste perception and preference.

Conducted systematic reviews on safety of dietary exposures and health benefits of dietary interventions. Outputs included white papers, submissions to FDA, and oral presentations for scientific and lay audiences.

Captained a team of scientists to systematically review evidence that investigated the association between dietary sweetness exposure and body weight-related outcomes; the product included a peer reviewed publication and open-access evidence map of >800 studies.

Advanced Exponent’s capabilities to analyze usual food and nutrient intake and nutrient adequacies using the National Cancer Institute’s usual intake macros, resulting in numerous analyses of diverse populations published in peer-reviewed journals.

Developed pharmacokinetics models of organophosphorus pesticides using non-linear mixed models for consideration by the EPA Federal Insecticide, Fungicide, and Rodenticide Act Scientific Advisory Panel.

Led a workshop to convene experts in nutrition, food science, and epidemiology from government, academia, and industry to develop a Research Roadmap to identify priorities for investigating effects of processed food on risk for obesity and cardiometabolic diseases.