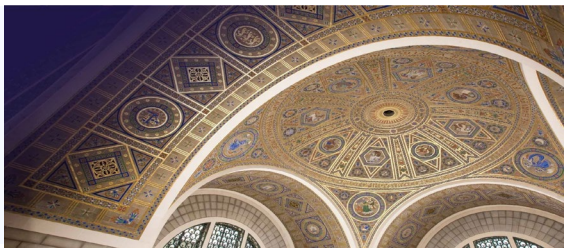
NATIONAL ACADEMIES Sciences Engineering Medicine

Board on Agriculture and Natural Resources

Exploring Linkages Between Soil Health and Human Health

Meeting 2 (Hybrid) – April 20, 2023

Public Agenda



THURSDAY, APRIL 20, 2023 (ET)

Purpose The session will focus on following items in the committee's statement of task:

- Relationships between the human microbiome and soil microbiome including the plant microbiome as part of a continuum
- Linkages between soil management practices and the nutrient density of foods for human consumption and other effects on food

Open session (updated 04/19/2023)

1:00 **Welcome**

Diana H. Wall, Committee Chair & Session Moderator, Colorado State University

1:10 **Committee introductions**

1:20 **Overview of the National Academies study process**

Kara Laney, Study Director, National Academies of Sciences, Engineering, and Medicine

1:30 **Invited presentations**

Megan O'Rourke, Brookings Congressional Fellow, Office of Representative Chellie Pingree

1:45 *Charles W. Rice, University Distinguished Professor, Kansas State University*

2:10 *C. Wayne Honeycutt, President and CEO, Soil Health Institute (remote)*

2:35 *Moul Dey, Professor, South Dakota State University (remote)*

3:00 **Speaker discussion with the committee**

3:30 **Open session concludes**

SPEAKER BIOS

MOUL DEY, SOUTH DAKOTA STATE UNIVERSITY

Dr. Dey is a professor of nutrition science in the School of Health and Consumer Sciences at South Dakota State University and the founding director of the molecular nutrition research program. The extramurally funded agenda investigates the connection between human health, nutrition, and agricultural commodities and has supported the

training of more than 40 researchers since its inception in 2010. One major focus area of Dr. Dey's interdisciplinary research has been to conduct nutrition trials in Upper Midwestern adult and older adult populations to understand how diet-microbiome interactions impact chronic disease risk and health span. Controlled feeding trials evaluated the USDA-recommended dietary pattern with different protein sources like red meat, poultry, and lentils, a calorie-restricted weight-loss plan, and a resistant starch-enriched ethnic diet. Discoveries include a novel prebiotic cholesterol-lowering effect of a wheat-derived resistant starch, and how the USDA-diet influences gut microbiota metabolism in individuals at-risk for age-related diseases. Dr. Dey's translational research has uncovered how in-utero dietary exposures can epigenetically program cardiometabolic health outcomes in later life. Her work has also demonstrated new anti-inflammatory mechanisms and chemo-preventive properties of dietary phytochemicals present in watercress, oats, grains of paradise, and native berry species. Dr. Dey has continuously served as a principal investigator since 2007 working with over 15 funding agencies including the NIH and USDA as well as served on 17 grant review panels for NIH, FFAR, and DoD among others. She is an associate editor of nutrigenomics for Frontiers in Nutrition and received the F. O. Butler Award for Research Excellence. Dr. Dey completed her doctoral research at the International Rice Research Institute in 2002 followed by postdoctoral training at Cornell University. She served as a research faculty in Rutgers University before moving to South Dakota in 2009.

C. Wayne Honeycutt, Soil Health Institute

Dr. Honeycutt leads the Soil Health Institute's programs to safeguard and enhance the vitality and productivity of soils. He previously served for 5 years as the Deputy Chief for Science and Technology with the Natural Resources Conservation Service (NRCS) of the U.S. Department of Agriculture (USDA) in Washington, DC, where he led programs in technology acquisition, development, and transfer to ensure NRCS conservation practices reflect the latest scientific advances for conserving our nation's soil, water, air, plant, animal, and energy resources. He served as a Research Soil Scientist for 14 years and a Research Leader for 10 years with the USDA Agricultural Research Service (ARS) New England Plant, Soil, and Water Laboratory, where he led and conducted interdisciplinary research on carbon, nitrogen, and phosphorus cycling and sustainable cropping systems development. In those roles he led national research teams for predicting nutrient availability, developed procedures adopted by ARS for enhancing national research coordination, and received regional and national awards for technology transfer. He is a graduate of the "Mastering the Art of Public Leadership" executive development program at the Brookings Institution in Washington, DC, and USDA's "Performance Excellence and Knowledge" executive development program. He has served on assignments to the U.S. Senate's Homeland Security and Governmental Affairs Committee, USDA-ARS National Program Staff, and USDA-ARS Area Office Staff. Dr. Honeycutt's commitment to agriculture is rooted in his experiences with raising tobacco, corn, and other crops on his family's 120-acre farm in Metcalfe County, Kentucky. He holds a Bachelor's degree in Forestry and Master's degree in Soil Science from the University of Kentucky, and a Ph.D. in Soil Genesis from Colorado State University. He was the 2018 recipient of the Hugh Hammond Bennett Award, the highest honor bestowed on an individual by the Soil and Water Conservation Society.

Megan O'Rourke, Office of Congresswoman Chellie Pingree

Dr. O'Rourke is a Brookings Congressional Fellow with the Office of Congresswoman Chellie Pingree. An agroecologist with scientific expertise in conservation, pest management, and climate change, she served in the Institute of Bioenergy, Climate, and Environment with the U.S. Department of Agriculture's National Institute of Food and Agriculture (NIFA). Prior to joining NIFA, Dr. O'Rourke was an associate professor of Sustainable Food Systems at Virginia Tech and served as a climate change advisor in the USDA Foreign Agricultural Service and U.S. Agency for International Development. She has led research in the United States to develop and evaluate on-farm conservation strategies for field crops, vegetables, and grasslands, and in Southeast Asia to advance sustainable pest management for vegetable production. She holds a Ph.D. in ecology from Cornell University, an M.S. in entomology from Iowa State University, and a B.S. in biology from Stony Brook University.

CHARLES W. RICE, KANSAS STATE UNIVERSITY

Dr. Rice is a University Distinguished Professor of soil microbiology in the Department of Agronomy at Kansas State University. He conducts long-term research on soil organic dynamics, nitrogen transformations and microbial ecology. Recently, his research has focused on soil and global climate change including carbon and nitrogen emissions in agricultural and grassland ecosystems and soil carbon sequestration and its potential benefits to the ecosystem. Dr. Rice has served in numerous capacities with the Soil Science Society of America. He also served on the National Academies U.S. National Soil Science Committee and the U.S. Department of Agriculture's Agricultural Air Quality Task Force. From 2016 to 2022, he was chair of the National Academies Board on Agriculture and Natural Resources. Internationally, he served on the UN Intergovernmental Panel on Climate Change (IPCC) to author the Fourth Assessment Report, Climate Change 2007, and was among the scientists recognized when that work won a Nobel Peace Prize in 2007. Dr. Rice holds a B.S. degree from Northern Illinois University and a Ph.D. from the University of Kentucky. He joined the Kansas State faculty in 1988, becoming associate professor in 1993 and professor in 1998.