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DIETARY SUPPLEMENTATION WITH RICE BRAN AND NAVY BEANS FOR GUT HEALTH AND DISEASE PREVENTION ACROSS THE LIFESPAN

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Rice bran, an agricultural byproduct of whole grain rice processing, and cooked dry beans are globally accessible, complementary, nutrient-dense functional foods that have evidence for prevention of chronic and enteric infectious diseases. Based on data from animal studies, we implemented and completed human dietary intervention trials with these foods in infants, children, healthy adults and colon cancer survivors using randomized controlled trials. The feasibility and tolerability was shown for increasing intake of rice bran and navy beans to levels that show beneficial effects on blood lipid regulation, the gut microbiome and stool metabolome. Additionally, the integration of food and nutritional metabolomics identified a number of prebiotics and phytochemicals that undergo gut microbial biotransformation to influence gut immunity. Microbiome was analyzed using 16S Illumina sequencing and the blood, urine, and stool metabolome was analyzed using UPLC-MS-MS. The effects of these foods on altered gastrointestinal

functions such as nutrient malabsorption and impaired immunity that can affect normal growth and development will be shown. The metabolite profiles depict changes in gut function across different chemical classes in response to the foods, such as fatty acids, primary and secondary bile acids and branched chain amino acids. Maturity of the gut microbiota during infancy and weaning periods are influenced by dietary patterns in a different manner than what we see in children and adults. This presentation will share outcomes related to diarrheal disease and anthropometric measurements in infant cohorts as well as modulation of the microbiome and metabolome in children and adults after consuming rice bran and/or navy beans. Funding support from the Bill and Melinda Gates Foundation Grand Challenges Explorations in Global Health, the US National Institutes of Health and US National Institutes of Food and Agriculture was provided for these studies.

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