

Dietary rice bran differentially promotes resistance to salmonella colonization in mice across varieties

Ajay Kumar, Angela Henderson, Tiffany L. Weir, Steve Dow and Elizabeth P. Ryan
Colorado State University, USA

Dietary modulation of the intestinal immune environment represents a novel approach for enhancing protective responses against pathogens and inflammatory diseases. We conducted a study to determine the effects of whole dietary rice bran, which contains numerous bioactive components, on Salmonella fecal shedding. Female 129Sv mice were fed 10 and 20% rice bran diet one week before and during infection for model of Salmonella infection.

Rice bran fed 129Sv mice had significantly reduced Salmonella fecal shedding as compared to control diet fed mice. Gut microbiome analysis using 454-adaptor pyrosequencing revealed that rice bran modulated the phyla Firmicutes and Verrucomicrobia. The number of Lactobacillus spp increased in mice (170 fold) after rice bran consumption and retained after one week of Salmonella infection compared to control diet fed animals. Also, we found that rice bran across diverse rice varieties differentially inhibited Salmonella fecal shedding and that polyphenols, fatty acids and certain minerals are candidate bioactive components for correlation with Salmonella fecal shedding.

Dietary rice bran consumption represents a novel means of reducing susceptibility to enteric infection with Salmonella and potentially other enteric pathogens as well by inducing protective gut mucosal immunity.

Biography

Ajay has completed his MS from Haryana Agricultural University in Food Science & Technology and MS in Nutritional Sciences from Florida State University. Currently, he is pursuing his PhD in Clinical Sciences at College of Veterinary Medicine and Biomedical Sciences, Colorado State University. His main focus of research is on "non-specific induction of mucosal immunity against enteric pathogens by dietary rice bran". He is working on functional foods for the last 5 years and published research articles as primary and secondary author.

ajay@mail.colostate.edu