MINNESOTA– Horse Gut Microbiome Responds in a Highly Individualized Manner to Forage Lignification

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Horses are hindgut fermenters with a small stomach and larger cecum and colon harboring millions of microorganisms. These microorganisms help make up the microbiome and are the sole contributors to the degradation and fermentation of forage cell wall components, including lignin. Alfalfa is commonly fed to horses, but can contain large amounts of lignin which can reduce feeding value, microbial degradation, and digestion. Cultivars of reduced lignin alfalfa are now available but have not been evaluated in the horse diet. The objective of this study was to evaluate equine fecal microbiome composition when feeding reduced lignin or conventional alfalfa hay to adult horses.

Reduced lignin and conventional alfalfa were fed to six adult horses, and included a 5-day total fecal collection period, during which horses were housed in individual box stalls and manure was removed on a continuous 24-hour basis. At 12-hour intervals, manure was mixed, frozen, and processed for sequencing to evaluate the microbiome. Reduced lignin alfalfa did not shift microbiome composition equally across all horses; however, each horse's microbiome responded to hay lignin content in an individualized manner. Horse-specific associations between individual gut microbiome traits and characteristics of the digested alfalfa were also observed, mainly in regards to dry matter digestibility and average fecal particle size. Findings emphasize the importance of considering individual and historical factors when designing or evaluating feeding programs for horses. More information on this research can be found at sciencedirect.com/science/article/abs/pii/S073708062030397X.