The Horse Species Symposium titled “Recent Advances in the Microbiome and Physiology of the Hindgut of the Horse and Dog” was held at the American Dairy Science Association–American Society of Animal Science Joint Annual Meeting on Wednesday, July 15, 2015, in Orlando, FL. The purpose of the symposium was to present up-to-date information about the microbiome of dogs and the hindgut of horses and whether it can be altered by diet and supplementation, both to improve digestion and to decrease gastrointestinal diseases. The symposium comprised 4 invited presentations, which are briefly discussed next.

The symposium started with a presentation from Dr. Jan Suchodolski (Texas A&M University, College Station) titled “Canine intestinal microbiology and metagenomics: From phylogeny to function.” Dr. Suchodolski explained, during his presentation, how recent studies have shown changes in microbial communities when dogs undergo either acute or chronic gastrointestinal inflammation. The dysbiosis that occurs is a result of a decrease in Firmicutes and Bacteriodetes, with a concomitant increase in Proteobacteria (Guard and Suchodolski, 2016). Recent metagenomics studies, which have used shotgun sequencing of DNA as well as phylogenetic investigation of communities by reconstruction of unobserved states (PICRUSt), have been pivotal in showing changes in bile acid metabolism and tryptophan catabolism in humans and dogs. Dr. Suchodolski’s presentation focused on advances made in metagenomics and metabolomics and how to better understand canine gastrointestinal disease as well as more suitable treatment approaches.

The next speaker was Dr. Veronique Julliand (AgroSup Dijon, Dijon, France), who summarized the research data on the horse’s hindgut microbiome, with the presentation “The microbiome of the horse hindgut: History and current knowledge.” She detailed, in chronological order, all the microbes that have been discovered to populate the equine microbiota, from protozoa in 1843, bacteria in 1897, zoospores of anaerobic fungi in 1910 (called monoflagellated eu-karyotic organisms), bacteriophage-like organisms in 1970, and archaea in 1996 (Julliand and Grimm, 2016). The fact that the majority of recent studies were conducted on feces instead of the cecum or colon leaves room for discussion on whether the fecal microbiota is a true representation of hindgut microbiota. She mentioned that horses that are more susceptible to gastrointestinal disease may harbor unique microbiota. Dr. Julliand finalized her presentation with the suggestion that a deeper knowledge and understanding of the microbiome of horses may allow for better monitoring and prevention of digestive diseases.

Dr. Molly Nicodemus (Mississippi State University, Mississippi State) was the third invited speaker and presented “Evaluation of the effectiveness of the establishment of an equine research herd with dual cannulation at the ileum and cecum” (Bova et al., 2015). The objectives of her study were to determine whether a dual cannulation surgery was feasible and to document the postoperative recovery of these horses. Eight horses were used for this study. A novel ileal cannula was developed for this study, and they used a rumen cannula for the cecum. The most common complications for the ponies during the postoperative time were fever and colic. After recovery, 5 horses remained healthy during the 7 mo for which they had been observed, whereas 3 had intestinal leakage into the abdominal cavity that
resulted in peritonitis within 2 wk after surgery and, therefore, were euthanized. They report their dual cannulation as successful, with a 63% survival rate.

The last speaker of the symposium was Dr. Josie Coverdale (Texas A&M University, College Station) with the presentation titled “Can the microbiome of the horse be altered to improve digestion?” In her presentation, Dr. Coverdale explained how current common practices and husbandry, such as feeding horses meals that are high concentrate but low in forage quality and quantity, and stall confinement all have an impact on intestinal function and large intestine fermentation. She explained that although the disruption of microflora and their environment can lead to gastrointestinal disorders, improvement in digestion can happen through multiple mechanisms such as forage quality, feeding management, feedstuff selection, and the inclusion of digestive aids, such as prebiotics and probiotics (Coverdale, 2016). Probiotics have been used in horses to prevent and treat gastrointestinal disease, to improve digestibility, and to stabilize the hindgut microbiome. Although the introduction of probiotics in the diet has produced variable results, mainly due to variations in the choice of organism, dosage, and basal diet, evidence indicates that the mode of action of successful probiotics is competitive inhibition and enhanced immunity. Commonly and successfully used probiotics in horses include *Lactobacillus*, *Bifidobacterium*, and *Enterococcus* and *Saccharomyces* yeast. These products have been shown to improve fiber digestibility, help maintain cecal pH, decrease lactic acid concentration, and enhance cellulolytic bacteria populations. Moreover, the use of prebiotics has been shown to improve digestibility of high-fiber diets as well as reduce disruption in colonic microbial population after an abrupt change in diet. In conclusion, Dr. Coverdale suggested that use of prebiotics and probiotics has the potential to create stability in the microbiome of horses, which impacts the digestibility and overall health of the horse (Coverdale, 2016).

The 2015 Horse Species Symposium on recent advances in the microbiome and physiology of the hindgut of the horse and dog was very well attended, and the quality of the meeting was excellent. Since then, we have learned of the tragic passing of Dr. Coverdale, which came to us as a shock and also a reminder to live your life to the fullest. She loved horses and she loved science, and she will be greatly missed.

**LITERATURE CITED**


