HORSE SPECIES SYMPOSIUM:
Recent advances in the microbiome and physiology of the hindgut of the horse and dog1

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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 to better understand canine gastrointestinal 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 microbiota in the presentation “The microbiome of the hindgut: History and current knowledge.” She ordered, in chronological order, all the microbes that have been discovered to populate the equine microbiota: 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 have been 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. Julliand suggested 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 months for which they had been observed, whereas 3 had intestinal leakage into the abdominal cavity.


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Received March 21, 2016. Accepted March 22, 2016. Published June 3, 2016.