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Towards a Better Understanding on the Ruminants: New Insights from the Rumen Microbiome

Tansol Park

Department of Animal Science and Technology, Chung-Ang University

The rumen microbiota plays an important role in providing the majority of the energy and nutrients required by ruminants. This rumen microbiota consists of several distinguished anaerobic microbial guilds (bacteria, archaea, fungi, and protozoa) which interact with each other to digest complex dietary compositions including recalcitrant dietary fibers. To better understand this multi-kingdom rumen microbiota and manage their populations to improve their contributions to rumen functions, comprehensive microbiome analysis is needed. Through the rumen-microbiome-specific analytic pipelines, many factors related to feed efficiency, environmental issues (e.g., CH_4 production, nitrogen excretion), and health conditions in ruminant production should be better identified. The effects of different dietary energy levels, heat-stress conditions, early life intervention on rumen microbiome has been analyzed and will suggest microbial biomarkers for proper modulations.