

Special Issue

Rumen Microbes and Fermentation

Message from the Guest Editors

Rumen microbes and their fermentation activity are central to ruminant nutrition. This complex microbial ecosystem breaks down fibrous feeds and provides energy and nutrients to the host animal. Through rumen fermentation, low-quality forages and by-products are converted into volatile fatty acids, microbial protein, and other important compounds that support animal growth, milk yield, and health. Advances in this field also aim to improve feed efficiency, reduce methane emissions, and enhance feed safety. To reach these goals, various nutritional, microbial, and genomic strategies have been developed.

Many factors shape rumen fermentation, including diet composition, feed particle size, feeding frequency, pH, temperature, microbial populations, and animal physiology. Additives such as direct-fed microbes, enzymes, and plant compounds are commonly used to influence fermentation patterns and improve feed stability. Despite this progress, several questions remain to be answered: how their metabolites are absorbed and utilized, how fermentation affects rumen and animal health, and how these processes relate to animal performance, product quality, and environmental sustainability.

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