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Exploration of Gastrointestinal Microbiota in Cattle for Better Milk and Beef Production

Satoshi Koike

Research Faculty of Agriculture, Hokkaido University, Japan

Gastrointestinal microbiota plays a vital role in health and nutrition in host animals. Ruminants are not exceptional; however, their relationship with commensal microbiota is different from the other animal species due to having unique and different digestive tract structures. The primary digestive tract in newborn ruminants is the intestine within one month of life, and then rumen takes over its position along with increased consumption of solid diet. Therefore, intestinal and rumen microbiota are important for calf growth and milk/beef production, respectively. Calf's growth performance during the first three weeks of life was improved by oral fiber administration four days after birth. This positive effect could be attributed to the improvement of the intestinal microbiota: increase of *Lactobacillus* spp. and decrease of *Clostridium perfringens*. Recent studies indicate the individual differences of rumen microbiota and its relationship with host productivity. The individuality of rumen microbial composition was also observed in Japanese Black cattle; abundance of *Prevotella* spp./Bacteroidales was negatively correlated with those of bacterial taxa belonging to Clostridiales, and their balances depended on individual animals. High-throughput and high-resolution analysis on rumen microbiota needs to be developed to generalize the individual differences in rumen microbiota. A combination of buccal swab samples and the MinION sequencing platform can be one of the solutions for high-throughput and high-resolution rumen microbiota analysis.