

Alfalfa Hay Improves Rumen Fermentation & Meat Quality of Simmental Crossbred Cattle by Altering Rumen Microbiota

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In recent years, due to the continuous growth of China's economy and population, China has become the world's largest producer and consumer of beef products. With increasing demand, how to use high quality roughage to improve beef quality has become an urgent problem to be solved. In this study, the effects of different proportion of alfalfa hay diet on growth performance, rumen fermentation, meat quality and rumen microbiota of Simmental hybrid cattle were studied. 80 healthy Simmental hybrid cattle were divided into 4 dietary treatments (4 replicates in each treatment and 5 cattle in each replicate). They were fed with control diet (wheat straw diet, WG), low alfalfa hay diet (LAG), medium alfalfa hay diet (MAG) and high alfalfa hay diet (HAG). Compared with WG, MAG and LAG significantly increased ADG of beef cattle. Moisture, crude protein, and ash of Longissimus dorsi (LD) were not significantly influenced by different dietary alfalfa proportion, the fat of LD in LAG, MAG and HAG were much higher than WG, MAG and LAG also increased the water-holding capacity compared with WG. The C18:3n3 composition of Longissimus dorsi in LAG, MAG and HAG were significantly higher than that in WG. Acetic acid of rumen liquid in MAG was significantly higher than that in WG. Due to the increase alfalfa hay in the diet, the relative abundance of *Firmicutes* tended to increase, the relative abundance of *Bacteroidetes* tended to decrease, *Firmicutes* in HAG were much higher than WG. At the genus level, the relative abundance of *Prevotella* in LAG, MAG and HAG were lower than WG, the relative abundance of *norank_f__Eubacterium_coprostanoligenes_group* in HAG was significantly lower than that in WG. Correlation analysis showed the groups of *Prevotella*, *NK4A214_group* were negatively correlated to fat of LD, *norank_f__F082* were negatively correlated to ADFI. In conclusion, feeding alfalfa hay can improve the growth performance and meat quality by altering rumen microbiota. These findings provided reference for the application of alfalfa hay in beef cattle breeding.

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