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Mixed silage with Chinese cabbage waste enhances antioxidant ability by increasing ascorbate and aldarate metabolism through rumen *Prevotellaceae UCG-004* in Hu sheep

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Silage is rich in nutrients, which can make up for the lack of seasonal roughage, and has a certain promotion effect on the intensive feeding of ruminants. In addition, silage can maintain the rumen function of ruminants to a certain extent and reduce the risk of rumen acidosis and abomasum translocation. The purpose of this study was to investigate the effects of the mixed silage of Chinese cabbage waste and rice straw (mixed silage) on antioxidant performance, rumen microbial population, and fermentation metabolism of Hu sheep. The 16 healthy Hu sheep (eight rams and eight ewes, 39.11±1.16kg, 5.5months) were randomly divided into two groups (the control group and the mixed silage group) with eight animals (four rams and four ewes) in each group. The control group was fed with farm roughage (peanut seedlings, corn husk, and high grain shell) as forage, and the mixed silage group was fed with the mixed silage as forage. The results showed that the mixed silage had no effect on the growth performance of Hu sheep ($p > 0.05$). Ruminal butyric acid, total volatile fatty acids (TVFA), and ammonia nitrogen (NH₃-N) concentration in the mixed silage group were increased, whereas the pH was decreased ($p < 0.05$). The blood and rumen total antioxidants capacity (T-AOC) concentration in the mixed silage group was higher, and the malondialdehyde (MDA) content in rumen, serum, liver, and kidney was lower than that in the control group ($p < 0.05$). PCoA and ANOSIM results of Illumina sequencing indicated that the mixed silage affected the bacterial composition of the rumen microbes. The mixed silage increased the proportion of *Prevotellaceae UCG-004* which was in a positive correlation with Vitamin C (Vc). In addition, PICRUSt functional