The effect of native lactic acid bacteria on fermentation of alfalfa silage at different temperature

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Microbial silage inoculants containing lactic acid bacteria have long been used to improve silage fermentation. The aim of this study was to examine the effect of native lactic acid bacteria on fermentation of alfalfa silage at different temperature.

Two native lactic acid bacteria strains (L1, L2) were isolated from native alfalfa silage. L1 was isolated from Alfalfa silage at Huanghua, China. And L2 was from Institute of Animal Science, Chinese Academy of Agricultural Science.

Alfalfa (*Medicago sativa* L), harvested in June 2012， was chopped at theoretical 20 mm at Bengbu, China. The alfalfa was treated with different LAB L1 (10^6 cfu/g FW), L2 (10^6 cfu/g FW). As a control was used alfalfa without added LAB. Material were immediately placed in separate polyethylene bags for silage and then were exhausted, and sealed. All samples were done in triplicates, and stored at different temperature (15℃ and 30℃) until 60 days later respectively. After the silos were opened, dry matter (DM) and pH were determined. And lactic acid (LA), acetic acid (AA), propionic acid (PA) and butyric acid (BA) were determined by high performance liquid chromatography .

The effect of different native LAB and temperature treatments on fermentation of alfalfa silage are shown in Table 1.The native LAB treatments significantly ($p<0.01$) decreased the pH values of the silage compared to the control. In addition, there was a decrease in NH_3-N of total N levels of the silage treated with native LAB. For temperature, pH is lower at 30℃ than 15℃. Overall, both native LAB strains played a positive role to alfalfa silage and performed better at 30℃.

In this study, after 60 days of ensiling treated with native inoculants properly improved the silage fermentation quality with markedly lower contents of NH_3-N of total N and markedly higher LA content as compared with the control silage.

Table 1 The effect of different native LAB and temperature treatments on fermentation of alfalfa silage

LAB	Temperature	DM	pH	LA	AA	PA	NH_3-N/TN
		g/kg FM		g/kg DM	g/kg DM	g/kg DM	g/kg TN
CK	15℃	252.30	5.28	68.10	15.76	0.00	111.27
	30℃	286.53	4.67	84.53	16.42	0.00	98.15
LAB1	15℃	267.16	4.58	81.20	19.38	0.00	67.30
	30℃	296.08	4.39	65.18	11.00	0.91	42.60
LAB2	15℃	268.67	4.73	65.93	12.51	0.00	61.82
	30℃	301.25	4.16	66.93	10.35	0.24	57.08
L		**	**	NS	NS	NS	**
T		**	**	NS	NS	NS	NS
L*T		NS	**	NS	NS	NS	NS

Values in the same columns within additive with different superscripts differ ($P<0.05$). ** $P<0.01$.

L*T: Interaction between LABs and Temperature