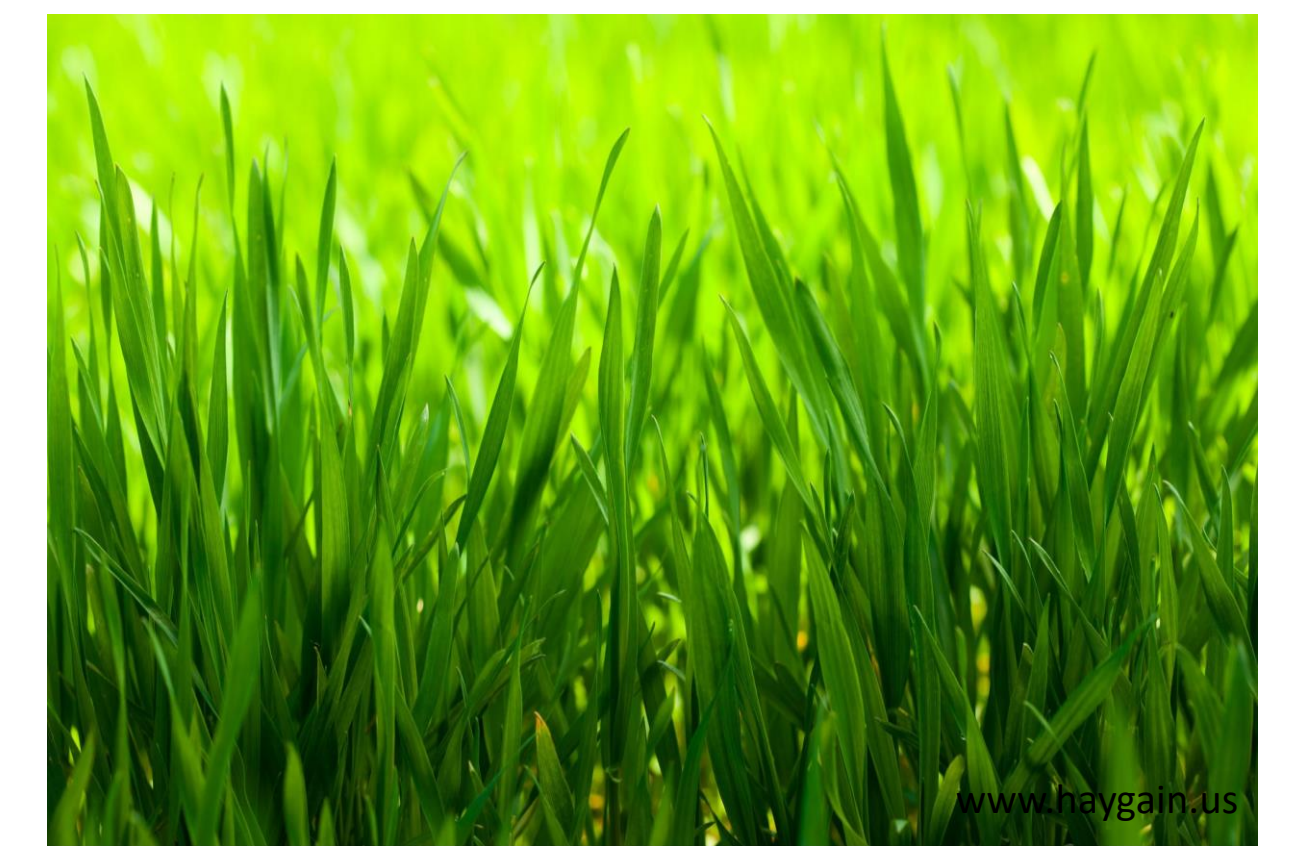


Sugar-rich grass: Effect of two inoculants on silage fermentation characteristics and nutritional value parameters



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INTRODUCTION

Perennial ryegrass (*Lolium perenne* L., 1st cut) was ensiled at 35 % dry matter (DM) and 170 g of water-soluble carbohydrates (WSC) per kg DM. Microsilos (Fig.1) with a 2.75-liter content were used, equipped with a Bunsen valve. A negative control was compared to the inoculants Lalsil Combo HC and Lalsil Dry HC (Danstar Ferment) for fermentation and nutritional value parameters.



Fig. 1: Microsilo.

TREATMENTS

Negative control

sterile physiological water

Lalsil Combo HC

@ 1 g/ton fresh matter

L. buchneri NCIMB40788

L. plantarum MA18/5U

Lalsil Dry HC

@ 1 g/ton fresh matter

L. buchneri NCIMB40788

P. acidilactici MA18/5M

beta-glucanase

xylanase

Silo opening after 90 days (n=5)

FERMENTATION CHARACTERISTICS & NUTRITIONAL VALUE PARAMETERS

Fermentation characteristics	Negative control	Lalsil Combo HC	Lalsil Dry HC	Sign.
DM (g/kg fresh matter)	337	a 360	b 341	a **
ammonia (g/kg DM)	2.88	a 2.05	b 3.21	c ***
ammonia-N/total N (%)	7.88	a 5.83	b 8.17	a *
pH	4.73	a 4.07	b 4.38	c ***
lactic acid (g/kg DM)	41.4	a 88.2	b 44.9	a ***
acetic acid (g/kg DM)	5.25	a 25.2	b 51.7	c ***
1,2-propanediol (g/kg DM)	0.00	a 2.67	b 47.8	c **
ethanol (g/kg DM)	46.0	a 17.3	b 29.3	c ***

Butyric acid and propionic acid: below level of detection

Lalsil Combo HC and Lalsil Dry HC both contain homo- as well as heterofermentative lactic acid bacteria, but had a very different effect on silage fermentation characteristics.

Lalsil Combo HC: low ammonia production, low pH, high on lactic acid

Lalsil Dry HC: high on acetic acid and 1,2-propanediol

Both inoculants significantly increased the net energy for lactation (NEL) compared to the negative control.

WSC levels were significantly lower after Lalsil Dry HC application than after Lalsil Combo HC application, also differing significantly from the negative control.

Nutritional value parameters	Negative control	Lalsil Combo HC	Lalsil Dry HC	Sign.
NEL (MJ/kg DM)	6.04	a 6.33	b 6.21	b **
digestibility of the OM (%)	86.3	a 87.6	a 85.1	a 0.108
crude protein (g/kg DM)	249	a 227	b 239	c **
crude ash (g/kg DM)	102	a 91.1	b 101	a *
crude fat (g/kg DM)	46.4	a 45.3	b 52.5	b *
NDF (g/kg DM)	441	a 399	b 431	a ***
ADF (g/kg DM)	234	a 215	b 237	c ***
WSC (g/kg DM)	28.4	a 19.4	b 5.74	c ***

CONCLUSION

Although the inoculants Lalsil Dry HC and Lalsil Combo HC both contain homo- as well as heterofermentative lactic acid bacteria, they had a strongly differing effect on silage fermentation and nutritional value parameters. Both inoculants did significantly increase the NEL of the grass silage compared to the negative control, favouring their on-farm application.