THE EFFECT OF A MULTI STRAIN AND ENZYME SILAGE INOCULANT ON FERMENTATION CHARACTERISTICS AND AEROBIC STABILITY OF GRASS SILAGE

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INTRODUCTION

Dual purpose inoculants containing homofermentative and heterofermentative bacteria were developed to overcome the limitations of inoculants containing either type of bacteria alone.

OBJECTIVE

Determine the effect of a commercial multi strain silage inoculant on the DM loss, fermentation characteristics and aerobic stability (AS) of wilted grass silage.

MATERIAL & METHODS

Forage : Wilted grass mixture **(Table 1)**
Set up : 12 L mini silo (4 silos/treatment)
Opening Times : 90 days
Treatments :
- **Control (C)** : no additive
- **Treatment (T)** : Sil-All4x4+WS *

Measurements :
- Nutritional value
- Fermentation characteristics
- DM losses
- Aerobic stability

Table 1 Chemical composition of wilted grass

DM	Ash	CP	NDF	ADF	WSC*	Soluble-N	dDM[1]	LAB	Yeast	Molds
g/kg	g/kg DM							log10 CFU/g FM		
623.6	88.6	145.4	569.5	329.6	89.4	6.6	812.5	6.22	6.55	5.18

[1] *In vitro dry matter digestibility*
**WSC= Water Soluble Carbohydrates*

Sil-All4x4+WS

Lactobacillus plantarum CNCM I-3235 (500 000 CFU/ g fresh forage)
Pediococcus pentosaceus NCIMB 12455 (200 000 CFU/ g fresh forage)
Propionibacterium acidipropionici CNCM MA/26 4U (200 000 CFU/ g fresh forage)
Pediococcus acidilactici CNCM I-3237 (100 000 CFU/ g fresh forage)
a-amylase , β-glucanase, cellulase and glucanase
(enzymes included at EU 1831/2003 efficacy application rate)

RESULTS & DISCUSSION

A. NUTRITIONAL VALUE

- Inoculant had no effect on the chemical composition of grass silages

B. FERMENTATION CHARACTERISTICS (Table1)

- Significantly decreased pH for T compared to C (P< 0.05)
- Ethanol content significantly lower in T than in C (P<0.05), which is in line with the lower yeast count for T (3.31 vs. 3.64 log CFU/g silage, P<0.05)
- Inoculant tended to improve lactic acid:acetic acid ratio (116 vs 46; P<0.1)

Table 1. Fermentation characteristics of silages after 90 d (DM base)

Item	C	T	SEM
pH	**4.90** [a]	**4.29** [b]	0.05
N-NH_3, g/kg N	**31.8**	**34.6**	1.7
Lactic acid, g/kg DM	**27.0** [a]	**19.7** [b]	0.4
Acetic acid, g/kg DM	**0.9**	**0.2**	0.2
Ethanol, g/kg DM	**6.7** [a]	**3.1** [b]	0.4
DM losses, g/kg DM	**67.2**	**61.1**	2.6

[a] [b] *Means within row with different superscripts differ (P < 0.05)*

C. DRY MATER LOSSES (Figure 1)

- DM losses during ensiling were 9% lower for the T group compared to C

D. AEROBIC STABILITY

- All silages were aerobically stable
- pH at the end of AS test significantly lower for T compared to C (P<0.05) **(Figure 2)**

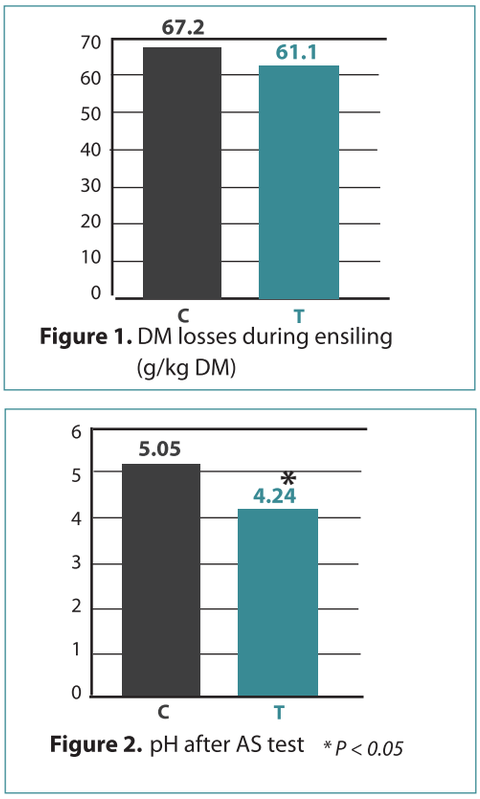

Figure 1. DM losses during ensiling (g/kg DM)

Figure 2. pH after AS test ** P < 0.05*

CONCLUSION

The multi strain and enzyme silage additive improved the fermentation characteristics (P<0.05) and reduced DM losses (P<0.05) of wilted grass silage.