

## **Heterolactic bacteria effects on sugarcane ensiling**

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**Introduction** Sugarcane ensiling without additives shows DM (dry matter) losses due to the alcoholic fermentation resulting of the high sugar content and epiphytic yeast population. Although, it triggered an increase interest among scientists and farmers, especially because of the logistics and operation benefits. One way to decrease the DM losses related to the fermentation process and improve the aerobic stability is the use of microbial inoculants containing heterolactic bacteria, which have shown the capacity to reduce yeast population in corn and temperate grass silages (Ranjit, 2000; Taylor, 2002). The objective of this study was to evaluate the DM losses during the fermentation and aerobic exposition of sugarcane silage inoculated with *L. buchneri*.

**Material and Methods** This study was carried out at the Department of Animal Science of USP/ESALQ. The sugarcane was harvested with 29.7% DM and 21.3° brix. The treatments were: 1) sugarcane ensiled without inoculant; 2) sugarcane inoculated with *L. buchneri* ( $1 \times 10^6$  ufc.g<sup>-1</sup> fresh forage). Four replications of each treatment were done. The experimental silos were 20L plastic buckets with lids adapted with Bunsen valves and an effluent collecting structure (sand + screen + cotton cloth). After a 77-d storage period, the silos were opened and samples (4kg) placed, without packing, in 20 L buckets without lids and allocated in a temperature controlled room through 10 days. Temperature sensors (data loggers) were placed in the geometric center of the silage mass and the temperature was recorded every 15 minutes. Samples were collected for pH and DM determination. DM recovery (DMR) was calculated according to Jobim et al. (2007). Data were analyzed by the MIXED procedure of SAS. Treatment means were compared by Tukey test with 5% significance.

**Results and Discussion** Sugarcane silage inoculated with *L. buchneri* improved the fermentative process, reducing ( $P < 0.05$ ) DM losses in 58.9% and, consequently, increasing ( $P < 0.05$ ) dry matter recovery (Table 1), due to a 68.9% reduction ( $P < 0.05$ ) in gas production of. Significant effects of these inoculants, during the aerobic exposition, were not ( $P > 0.05$ ) observed (Figure 1). Usually, *L. buchneri* additivated silages, show lower DM losses and higher stability during silage feedout (Driehuis et al. 1999; Ranjit, 2000; Mendes et al. 2008). However, both silages showed high aerobic stability (Table 2), probably due to the high acetic acid content.

**Conclusion** Inoculating *L. buchneri* in sugarcane silage was effective to decrease fermentation losses.

## **References**

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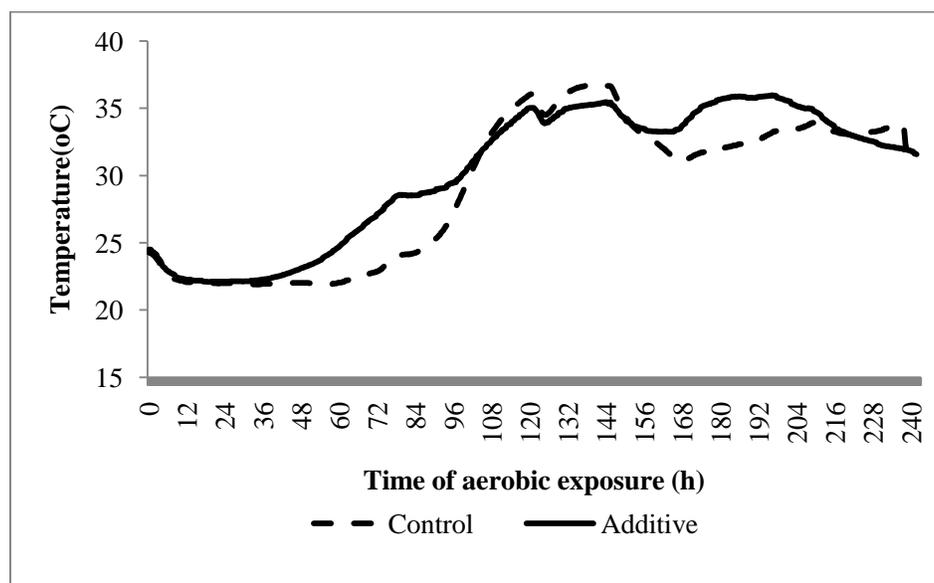
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**Table 1.** Effects of *L. buchneri* on fermentation of sugarcane silages

Variables	Control	Additive	SEM	P
Opening DM, %	27.18	29.62	0.81	0.08
Opening pH	3.74	3.64	0.03	0.07
DM losses (%)	19.65	8.15	1.39	<0.01
DM recovery (%)	80.35	91.85	1.39	<0.01
Gas losses (% DM)	17.26	5.37	1.49	<0.01
Effluent production (kg/t fresh forage)	27.25	28.41	3.28	0.82

**Table 2.** Effects of *L. buchneri* on aerobic stability of sugarcane silages

Aerobic stability	Control	Additive	SEM	P
pH after five days	3.41	3.44	0.04	0.75
pH after 10 days	4.57	4.84	0.16	0.45
Aerobic stability (h)	94.1	78.0	9.08	0.26
DM losses, 5 days of aerobic exposition (%)	10.37	7.17	1.57	0.20



**Figure 1.** Effect of *L. buchneri* on sugarcane silages temperature during aerobic exposure