Evaluation of inoculated sorghum silage in Holstein heifer weight gain

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Introduction The use of silage additives is recommended to preserve the nutritional value of the crop when certain circumstances could compromise proper fermentation. The enzyme-bacterial homofermentative inoculants (EBHoI) are a type of silage additives available, and they have been classified as stimulators of fermentation. For forage sorghums, a high relationship plant status / panicle, the dry matter concentration (% DM) of the whole plant is low, making that the fermentation requires higher concentration of lactic acid for proper pH decrease. The EBHoI had better fermentation and conservation of the silage. When this silage is used in heifer diets it could improve the animal performance. A trail was performed to assess the body weight (BW) gain and dry matter intake (DMI) in Holstein heifers using sorghum silage treated with enzyme-bacterial homofermentative inoculant (EBHoI) in total mixed ration (TMR).

Materials and Methods Sixty Holstein heifers were used, they were about 220 kg initial live weight and average 11 months old. Each treatment was divided into 3 groups of 10 animals each. The experimental period lasted 40 days. The TMR was composed (DM based) 72% of sorghum silage (inoculated and non inoculated), 11.5% soybean meal, 15.7% corn grain, 0.189% urea. TMR was formulated with same ingredients and amounts, giving isoproteic and isoenergetic characteristics for both treatments. The inoculated treatment consisted of TMR with forage sorghum silage inoculated with LactoSilo ® and Control, forage sorghum silage TMR non-inoculated. Measurements were made every 13 days, weighing the entire group for each repetition. TMR consumption was determined on days weighing for each group too. Statistics were carried out in Infostat 2011 using ANOVA considering of time effects, using time-sequence analysis.

Results and Discussion Also, Kung and Muck (1997) concluded that homofermentative bacteria reduce the loss of DM to the minimum level (2-3%), getting the pH down, decreasing proteolysis and the ammonia training, the lactic acid increase and the digestibility too. (Contreras-Govea et al., 2009). The values measured in the groups, the number of affected animals and testing days to generate the data are shown in Table 1.

Table 1 BW increase and consumption

	Treatment		
Item	Control	Inoculated	p-values
Final BW, kg animal^{-1}	272.68	280.15	.0001
BW gain, kg day^{-1}	0.630	0.730	.0354
DM intake, kg DM day^{-1}	7.37	7.49	.0013
Conversion efficiency, kgDM/kgBW^{-1}	12.03	10.65	.1135

Initial BW was 248.33 Kg animal^{-1} for the Control and 252.00 Kg animal^{-1} for the inoculated treatment, were used like covariate for statistical analysis. The increase in daily

individual BW in the inoculated treatment animals showed 15.8% higher than control, and this difference is significant. The initial weigh showed a difference between the weight of lots of treatment and control, the initial difference was of 3.67 kg animal^{-1} and this was taken like covariate. In the end of this test, the difference was 7.5 Kg animal^{-1}.

There was a statistically significant difference in the consumption of TMR, being 1.62% more for inoculated treatment. The conversion efficiency of KgDM kgBW^{-1}, has better efficiency by inoculated treatment, requiring 1.38 KgDM kgBW^{-1} less than the control, also this difference is not significant. A review of research studies by Kung and Muck (1997) reported that the inoculants improve weight gain in beef cattle and milk production of lactating cows in 50% of the studies (Contreras-Govea, 2009)

Conclusions Better weight gain was showed for treatment, about 15.8%. Kung and Muck (1997) concluded that when the silage was inoculated it had a positive effect, the average increase in expected weight gain was 5%, while milk production increased 3% (Contreras-Govea, 2009).

Kung (2007) reported that after the review of 14 works published in the United States corn silage inoculated with EBHoI, only 3 showed increases in animal performance. Moreover, of 15 studies analyzed by Kung and Muck (1997), 8 were positive in respect to higher weight gains from the use of inoculated silage.

Consumption was 2.6% higher for the inoculated treatment, Kung and Muck (1997) showed that in a total of 67 studies, 19 had increased intake response.

Although, the control needed 12.9% Kg DM more than the inoculated treatment to produce one Kg BW, also this difference is not significant.

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