

Introduction

- ✓ Optimizing livestock production systems has been a central focus of recent research;
- ✓ Adapting diets to meet specific nutritional requirements of animals has been effective in reducing waste, labor, and costs;
- ✓ In this context, total mixed ration (TMR) silages have emerged as a promising strategy in ruminant production due to their operational and nutritional advantages;
- ✓ TMR silage also demonstrate greater aerobic stability, maintaining feed quality over time;
- ✓ The use of microbial inoculants, such as *Lentilactobacillus buchneri*, improves silage quality by reducing dry matter losses, minimizing ethanol production;
- ✓ It was hypothesized that TMR silages influence intake and digestibility in beef cattle.

(Nair et al. 2020)

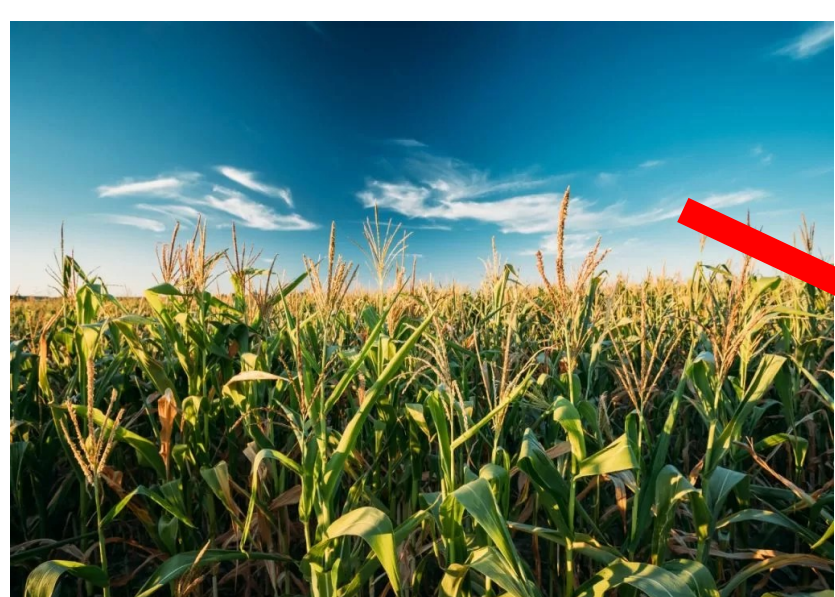
Objectives

- ✓ Our objective of this study was to evaluate the effects of TMR corn silages, with or without *L. buchneri* inoculation, on the intake and digestibility of nutrients in beef cattle.

Materials and Methods

- ✓ The experiment was conducted in the Federal University of Viçosa, Viçosa, Minas Gerais, Brazil;
- ✓ A 4 × 4 Latin square design was used, with four animals, four diets, and four experimental periods;

Type of silage: CS and TMR



Corn crops

Inoculant:
CTRL and LBBeef cattle:
Intake and
Digestibility

- ✓ The treatments followed a 2 × 2 factorial arrangement, including two silage types [corn silage (CS) and total mixed ration silage (TMR)] with or without (CTRL or LB) microbial inoculant;
- ✓ The inoculant used was a commercial product containing *Lentilactobacillus buchneri* (LB) (LalSil AS, CNCM I-4323, Lallemand Animal Nutrition®, Brazil);
- ✓ The TMR formulation included ground corn, soybean meal, urea, mineral premix, sodium bicarbonate, and magnesium oxide, with a roughage-to-concentrate ratio of 40:60, formulated for finishing beef cattle;
- ✓ CS and TMR were ensiled in concrete silo tubes and stored for 90 days;
- ✓ The experimental period lasted 80 days, divided into four 20-day periods, with 14 days for diet adaptation and six days for sample collection;
- ✓ Feed intake and digestibility were determined by the difference between feed offered and refusals, complemented by fecal sampling;
- ✓ The statistical significance used was declared at $P \leq 0.05$.

Results

- ✓ No significant effects ($P \geq 0.05$) of silage type (S), inoculant (I), or their interaction ($S \times I$) were observed on the intake of dry matter, organic matter, or starch;
- ✓ However, an effect of silage type ($P = 0.0338$) was observed on neutral detergent fiber intake;
- ✓ An interaction effect ($S \times I$) was detected ($P = 0.0464$) for organic matter digestibility;
- ✓ Animals fed TMR silage exhibited higher digestibility of dry matter ($P = 0.0011$), crude protein ($P = 0.0130$), and starch ($P = 0.0028$) compared to those fed CS;
- ✓ Neutral detergent fiber digestibility was not influenced ($P \geq 0.05$) by any of the factors studied;

Table 1. Nutrient digestibility of diets fed to finishing beef cattle based on whole-plant corn silage (CS) or total mixed ration silage (TMR), with (*L. buchneri*; LB) or without (CTRL) microbial inoculant.

Inoculant	Silage				P-value		
	SM	TMR	Average	SEM	S	I	S × I
Dry matter (%)							
CTRL	71.06	77.03	74.04	1.689	0.1538	0.0011	0.0545
LB	64.08	78.34	71.21				
Average	67.57	77.68					
Organic matter (%)							
CTRL	72.60Ba	78.33Ab	75.46	1.634	0.1239	0.0010	0.0464
LB	65.48Bb	79.51Aa	72.49				
Average	69.04	78.92					
Crude protein (%)							
CTRL	63.01	68.70	65.85	2.448	0.1877	0.0130	0.1156
LB	51.54	69.91	60.72				
Average	57.27	69.30					
Starch (%)							
CTRL	84.81	90.93	87.87	1.005	0.7992	0.0028	0.8780
LB	84.25	90.79	87.52				
Average	84.53	90.84					

SEM: Standard error of the mean; P-value: Probability of effects for inoculant (I), silage type (S), and their interaction ($I \times S$); Means followed by different uppercase letters in rows and lowercase letters in columns differ significantly according to Fisher's F-test ($P \leq 0.05$).

Conclusions

- ✓ Corn silage, fed alone or as part of a total mixed ration, does not significantly affect the nutrient intake of beef cattle. However, its inclusion as a component of TMR silage increases the digestibility of dry matter and starch, providing a practical advantage in the daily feeding of animals using ensiled TMR.

Acknowledgements

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References

- ✓ Nair, J., Huaxin, N., Andrada, E., Yang, H. E., Chevaux, E., Drouin, P., & Wang, Y. (2020). Effects of inoculation of corn silage with *Lactobacillus hilgardii* and *Lactobacillus buchneri* on silage quality, aerobic stability, nutrient digestibility, and growth performance of growing beef cattle. *Journal of Animal Science*, 98(10), skaa267.