Chemical composition and intake of sheeps feed with corn silages inoculated with *Lactobacillus plantarum* and relocated

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Introduction The relocation process affecting the chemical, fermentative characteristics and animal intake, especially in silages that have high lactic acid concentration. Thus, the aim with this study was to determine the relocation time effect of corn silages inoculated with *L. plantarum* on chemical composition and intake by sheep.

Material and Methods The corn was harvested when dry matter (DM) concentration was at 32.5%. The experimental treatments consisted of: C = control silage (not inoculated and not relocated); R-12h = relocated by 12 h; IR-12h = inoculated with *L. plantarum* (1.0×10^5 colony forms units (CFU) per gram of fresh forage) relocated for 12 h; and R-24h = relocated by 24 h, all with six repetitions. Twenty-four 200-L plastic gallon silos were used as experimental silos. The silos were opened after 30 d of storage time and relocated for 12 and 24 h. After 45 d of relocation, the silos were opened for evaluation and intake assay. For this assay, 24 Santa Inês sheeps, male, with initial body height 17.5 ± 1.83 kg were used during 21 d (14 d for management, feeding and environment adaptation + 7 d for feed and orts sampling). The animal test was approved by the Animal Use Ethics Commission (CEUA) of UFRA, protocol Nº 022/2016. A completely randomized design was used for the evaluation of silage characteristics, while for intake assay, a randomized block design was used. The variables were analyzed using R software. Significant differences were assessed at the 5% probability level using three orthogonal contrasts: C x R-12h, IR-12h and R-24h; R-12h and IR-12h x R-24h; R-12h x IR-12h.

Results and Discussion The R-12h silages had higher DM and lower NDF content (Table 1), compared to IR-12h silages. The higher DM content in R-12h silages may indicate lower DM losses in these silages. The use of *L. plantarum* bacterial strains can increase the concentration of lactic acid which during aerobic exposure of silage, probably potentiated the development of spoilage microorganisms, leading to higher NDF content. The R-24h silages presented higher CP content when compared to R-12h and IR-12h silages, which is explained by the probable decrease of soluble sugars and the increase of these nitrogen compounds. Sheep fed with silages R-12h, IR-12h, and R-24h presented higher CEE (g/d and % BW) and lower CNDF (% BW) (Table 1), compared to C silages. The higher CEE may be related to the lower CNDF, as this may limit the intake of other nutrients due to the higher rumen filling. The supply of silages R-12h and IR-12h promoted higher CEE (g/d and % BW) and higher CNDF (% BW) when compared to R-24h silages. The higher NDF intake in silages R-12h may be related to a

higher content of this component in inoculated silages (Table 1). The use of IR-12h silages in sheep diets provided higher CNFC (g/d), despite the higher NDF content in these silages, and lower CEE (% BW) when R-12h. The high rate of degradation of NFC allows a shorter time of feed in the rumen and consequently increased intake of this nutrient by animals (Tafaj et al., 2007).

Table 1 Chemical composition and consumption of corn silages inoculated with *L.plantarum* and relocated.

Variables	Treatments				Contrast (P)		
	C[1]	R-12h[2]	IR-12h[3]	R-24h[4]	I[5]	II[6]	III[7]
Chemical composition (%)							
DM[8]	31.72	33.21	31.74	32.32	0.142	0.758	<0.05
OM[9]	96.18	96.23	96.07	95.98	0.409	0.129	0.190
CP[10]	7.14	6.99	7.22	7.36	0.671	<0.05	0.135
EE[11]	2.90	2.50	2.41	2.64	0.316	0.638	0.855
NDF[12]	56.10	53.09	58.96	57.55	0.837	0.492	<0.05
NFC[13]	30.02	33.65	30.06	28.53	0.663	0.073	0.102
Intake (g/d)							
DMI[14]	512.44	552.88	566.41	581.07	0.124	0.664	0.381
OMI[15]	493.96	528.37	541.67	554.34	0.173	0.699	0.380
CPI[16]	39.88	41.54	41.02	44.39	0.435	0.288	0.801
EEI[17]	17.10	28.59	25.52	23.60	<0.05	<0.05	0.099
NDFI[18]	282.74	256.30	272.62	251.09	0.129	0.388	0.362
NFCI[19]	235.70	204.33	239.94	243.17	0.617	0.143	<0.05
TDNI[20]	395.76	354.92	381.28	366.64	0.370	0.964	0.491
Intake (%BW[21])							
DMI	2.73	2.73	2.88	2.71	0.711	0.426	0.304
OMI	2.63	2.61	2.75	2.58	0.895	0.434	0.293
CPI	0.21	0.21	0.21	0.21	0.708	1.000	0.760
EEI	0.09	0.15	0.13	0.12	<0.05	<0.05	<0.05
NDFI	1.51	1.37	1.39	1.26	<0.05	<0.05	0.825
NCFI	1.26	1.09	1.22	1.22	0.153	0.229	0.074
TDNI	2.11	1.88	1.94	1.85	0.128	0.655	0.732

[1]control; [2]silage relocated for 12h; [3]inoculated silage and relocated for 12h; [4] relocated silage for 24h; [5]I = non-relocated corn silage x relocated corn silage; [6]II = corn silage, inoculated or not, and relocated for 12h x corn silage relocated for 24h; [7]III = inoculated corn silage and relocated for 12 h x non-inoculated corn silage and relocated for 12 h; [8]dry matter; [9]organic matter; [10]crude protein; [11]ethereal extract; [12] neutral detergent fiber; [13]non-fibrous carbohydrates; [14]dry matter intake; organic matter intake; [16]crude protein intake; [17]ether extract intake; [18]neutral detergent fiber intake; [19]non-fibrous carbohydrate intake; [20]total digestible nutrient intake; [21]body weight.

Conclusion The relocation of corn silage (inoculated or not) for 12 or 24 h affects the ether extract and neutral detergent fiber intake of sheeps.

References

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