

**EFFECT OF ENERGETIC SUPPLEMENTATION ON FORAGE LOSSES IN AN OAT
AND ITALIAN RYEGRASS PASTURE UNDER CONTINUOUS GRAZING**

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Abstract

The experiment was conducted at UFSM-RS to quantify herbage losses in oat and italian ryegrass mixture under continuous grazing by beef heifers. A continuous grazing method with variable stocking rate was utilized to maintain the same herbage mass, 1500 kg DM/ha, in all treatments. The treatments consisted of levels of energetic supplement (0, 0.7 and 1.4% of LW/day). The pasture was evaluated every 28 days, when forage not suitable for grazing was collected in points previously marked in experimental area. The daily losses of herbage mass were of 22.32, 18.98 and 21.16 kg of DM/ha/day, equivalent to 2.61, 1.91 and 1.41% of LW for levels of 0, 0.7 and 1.4% of LW/day, respectively. The results showed greater stocking rates in supplemented treatments, being 21.2% and 57.4% higher in 0.7 and 1.4% LW/day, respectively, than unsupplemented one.

Keywords: oat, ryegrass, forage losses, continuous grazing, beef heifers, supplementation

Introduction

During permanence of animals in pasture the forage biomass available can be consumed, lost or may stay in plants as residual dry matter. The intensity of losses of forage can be influenced by climatic conditions, plant age, architecture of plants and by stocking rate. It is necessary quantify the several routes of forage produced in our pastures by the knowledge of real characteristics of environment, necessary adaptations of species and handling of pastures associated with intended animal production (Maraschin, 1993). Italian ryegrass and oats are the more important annual species used in Rio Grande do Sul for winter pastures, with research results demonstrating high animal production (Lupatini et al. 1997, Restle et al. 1997). There is no quantification of forage losses in oat and ryegrass mixture under continuous grazing with high stocking rate, which is allowed by supplementation. Thus the objective was to estimate forage losses in these species under high stocking rate.

Material and Methods

The experiment was carried out at UFSM-RS, from 06/09 to 11/12/1999. The experimental area had 17 ha and was divided in ten paddocks. The area was dried with glyphosate and sowed directly with 80 kg/ha of black oat (*Avena strigosa*) and 30 kg/ha of italian ryegrass (*Lolium multiflorum*). The amount of 10-20-10 NPK fertilizer used was 200 kg/ha, and more 90 kg/ha of nitrogen in four applications. Beef heifers Charolais, Nellore and their crosses seven months-old, average initial weight of 204 kg were used.

Grazing method was a continuous, Put & Take system, adjusted to maintain the same herbage mass, 1500 kg DM/ha, for all treatments. Losses of forage mass were evaluated every 28

days. Inside of each experimental unit 20 points were demarcated, each point with area of 0.2 m². At this points samples were collected to determine forage considered not suitable for animals (material senescent, dead and damaged by trampling and grazing). The treatments consisted of levels of energetic supplement (0, 0.7 and 1.4% of LW/day).

The experimental design was completely randomized with three replications. The data were submitted to variance analysis, through Lineal General Models Procedure (SAS, 1989).

Results and Discussion

The different supplementation levels affected the carrying capacity of mixed oat italian ryegrass pasture. Table 1 shows greater carrying capacity ($P < 0.05$) in levels of oat italian 1,4 and 0,7 of LW/day supplementation (1516 and 1168 kg LW/ha). The carrying capacity of pasture without supplement, 963 kg LW/ha, was lower than 1,4 and similar to 0,7 level. With energetic supplementation in winter pasture it was possible increase carrying capacity in 21.2% and 57.4% for supplementation levels of 0.7 and 1.4% LW/day. Roso and Restle (1998) observed in pasture with annual winter grasses under continuous grazing average carrying capacity of 1143 kg LW/ha, similar to the values found in the present work for no supplementation and 0,7 of supplementation level.

Table 2 shows forage losses in kg of DM/ha/day. There was not difference ($P > 0.05$) among the treatments for the studied variable. It was observed that the values of losses were constant until the third period, so decreased in the last period of grazing. The daily losses of forage were 22.32, 21.16 and 18.98 kg of DM/ha for no-supplement and levels of 1.4% and 0.7% kg LW/day, respectively. These values were higher than those found by Roso and Restle (1988) evaluating annual winter pastures: 6.64, 5.64 and 11.00 kg of DM/ha/day for oat+ryegrass, triticale+ryegrass and rye+ryegrass mixtures, respectively. This could be

explained, maybe, by the previous utilization of herbicide Glyphosate in the experimental area. The dead material in samples could contain some material dried by herbicide.

The daily losses of forage were equivalent to 2.61, 1.91 and 1.41% of the animal's live weight, for no-supplement and supplementation levels of 0.7 and 1.4% of LW/day. Roso and Restle (1998) with annual winter mixtures found average of 0,82% of LW of losses in the pasture. Similar value, 0,84% LW, was found by Soares (1999) with triticale and ryegrass mixture. There was not difference ($P>0.05$) among the treatments for the studied variable. This data suggests the great adaptation of oat and ryegrass mixture to continuous grazing with high stocking rate.

References

- Lupatini, G.C., Restle J., Ceretta M., Moojen E.L. and Bartz H.R.** (1993). Avaliação da mistura de aveia preta (*Avena strigosa*) e azevém (*Lolium multiflorum*) sob pastejo submetida a níveis de nitrogênio. Anais da 30ª Reunião Anual da Soc. Bras. de Zoot., 72.
- Maraschin, G.E.** (1993). Perdas de forragem sob pastejo. *Simpósio sobre Ecossistema de Pastagens*, 2. Anais/Editado por Vanildo Favoretto, Luís Roberto de Andrade Rodrigues e Ricardo Andrade Reis. Jaboticabal, FUNEP, 245 p., 166-189.
- Restle, J., Soares A.B. and Roso G.** (1997). Dinâmica de uma pastagem de aveia preta (*Avena strigosa*) e azevém (*Lolium multiflorum*) submetida a fontes de nitrogênio. Anais da 34ª Reunião Anual Soc. Bras. de Zootecnia. 179 - 181.
- Roso, C. and Restle J.** (1998). Perdas de forragem em pastagem com gramíneas anuais de estação fria sob pastejo contínuo. Anais da 35ª Reunião Anual da Soc. Bras. de Zootecnia, 465 - 467.
- SAS Institute Inc.** SAS/STAT. (1989). *User'Guide*. Version 6, Fourth ed., 2, 846 p.

Table 1 – Effect of energetic supplementation on the carrying capacity of mixed oat and ryegrass pasture. Santa Maria - RS, 1999.

Treatments	Periods				Average
	07/07 a 04/08	05/08 a 01/09	02/09 a 01/10	02/10 a 12/11	
	Carrying capacity (kg LW/ha)				
No Supplement	711	717	980	1444	963 ^b
0.7 % LW	880	984	1171	1637	1168 ^{ab}
1.4 % LW	1435	1141	1424	2065	1516 ^a
Average	1009	947	1192	1715	

*Values followed by different letters had significant difference (P <0.05); Tukey at 5%

Table 2 - Expressed forage losses in kg of DM/ha/day and as percentage of live weight for period and average in the pasture of oat and ryegrass in different supplementation levels. Santa Maria-RS, 1999

Treatments	Periods				Average
	16/07 a 13/08	14/08 a 16/09	17/09 a 15/10	16/10 a 10/11	
	kg DM/ha/day				
S/Supplement	15.63	34.80	22.43	16.43	22.32 ^a
0.7 % LW	21.66	24.13	22.60	13.53	18.98 ^a
1.4 % LW	21.36	19.53	30.23	7.53	21.16 ^a
Average	19.55	26.15	25.08	12.49	
	% LW				
S/Supplement	2.19	4.85	2.28	1.13	2.61 ^a
0.7 % LW	2.46	2.45	1.93	0.82	1.91 ^a
1.4 % LW	1.48	1.71	2.12	0.36	1.41 ^a
Average	2.03	3.00	2.11	0.77	

*Values followed by different letters had significant difference (P <0.05) for the test of Tukey