Dynamics and Production of Forage in Winter Pasture under Continuous Grazing with Energetic Supplementation

A. Frizzo
Universidade Federal de Santa Maria, Brazil

M. R. Freitas
Universidade Federal do Rio Grande do Sul, Brazil

Marta G. da Rocha
Universidade Federal de Santa Maria, Brazil

ID # 22-45

DYNAMICS AND PRODUCTION OF FORAGE IN WINTER PASTURE UNDER CONTINUOUS GRAZING WITH ENERGETIC SUPPLEMENTATION

A. Frizzo[1], M.R. Freitas[2] and M.G. da Rocha[3]

[1]Departamento de Zootecnia - Universidade Federal de Santa Maria, RS, Brasil, afrizzo@zaz.com.br, sponsored by CAPES

[2]Departamento de Plantas Forrageiras - Universidade Federal do Rio Grande do Sul, Porto Alegre, RS, Brasil

[3]Departamento de Zootecnia - Universidade Federal de Santa Maria - RS, Brasil

Abstract

This experiment was carried out at Federal University of Santa Maria, from July 09 to November 12, 1999 to evaluate the dynamics and production of forage of oat (*Avena strigosa* Schreb) and italian ryegrass (*Lolium multiflorum* Lam) mixture. The grazing system used was continuous with variable stocking rate to maintain 1500kg/ha of herbage mass in all treatments. The heifers were subjected to different levels of energetic supplementation. They are 0, 0.7 and 1.4% of LW/day. The pasture of oat and italian ryegrass presented an accumulation rate of 45.7, 55.1 and 50.0 kg of DM/ha /day and a total dry matter (DM) production of 7067, 7222 and 8137 kg/ha for 0, 0.7 and 1.4% of LW/day levels, respectively. The average percentage of leaf component was 8.26, 11.48 and 11.72 for oat and 23.12, 22.35 and 20.93 for italian ryegrass at 0, 0.7 and 1.4% of LW/day levels, respectively. The supplementation neither affected the accumulation rate nor the total DM production of the pasture ($P > 0.05$). The senescent material was lower ($P < 0.05$) with no supplementation.

Keywords: Oat, italian ryegrass, continuous grazing, forage production, supplementation.

Introduction

Rio Grande do Sul has about 5 million hectares cultivated with soybean and corn, of which only 12% are used for wheat culture. The remaining area could be better profited through the use of winter pasture (IBGE, 1996). The winter pastures have been used to maintain an adequate animal development and there are several data from available research on the subject. However, there are few available data, however, on the dynamics of winter pasture such as italian ryegrass and oat when grazed by supplemented bovines. The aim of this work was to evaluate the dynamics and productivity of oat and italian ryegrass pasture under continuous grazing with bovines receiving different levels of energetic supplementation.

Material and Methods

The experiment was conducted at the Department of Animal Science at the Federal University of Santa Maria, RS, in a 17 ha area, divided in ten paddocks of approximately 1 ha. Direct sowing was carried out by using 80 kg/ha of oat (*Avena strigosa* Schreb) and 30 kg/ha of italian ryegrass (*Lolium multiflorum* Lam). The used fertilization was 200 kg/ha of the formula 10-20-10 and 90 kg of nitrogen at planting, in the form of urea, in four applications. The grazing period was from June 9 to November 12, 1999. The used heifers were Charolais, Nellore**,** and their crosses, 7-month-old and with initial average weight of 204 kg.

The pasture was evaluated each 28 days since on July 8, 1999. In evaluations five samples were cut (0.25 m^2/sample). After homogenization, a sample was taken out for determining botanical composition. The leaf, stem, senescent material, and dead material fractions were

separated by hand. Botanical components were dried for estimating the percentage of each component in total dry matter (DM).

The DM accumulation rate in the different experimental units was estimated through three exclusion cages.

The experimental design was fully randomized with three repetitions (paddocks). The data were subjected to variance analysis through General Linear Models Procedure (Proc GLM; SAS, 1989) and Tukey test at 5%.

Results and Discussion

In the Table 1, the data of accumulation rate (kg DM/ha/day) and production of total dry matter (kg DM/ha) are presented. There was no difference (P>0.05) for accumulation rate among the treatments. Lower values than these were found by Restle et al. (1997) when working in oat and italian ryegrass pasture with a 200 kg level of N/ha applied as urea and ammonium sulfate. Lupatini et al. (1997) evaluating the mixture of oat and italian ryegrass subjected to 0, 150 and 300 kg levels of N/ha obtained crescent values in accumulation rates (37, 82 and 96 kg/ha/day of DM, respectively). In this work, it was observed a 45.76 kg DM/ha/day accumulation rate in the treatment with no supplement, while for treatments with supplementation the values found were higher (55.10 and 50.08 kg DM/ha/day). There was no difference (P>0.05) for the production of forage in the different treatments. Alvim et al. (1987) using 100 kg of N/ha in italian ryegrass pasture obtained total DM production of 7209 kg/ha, similar to the one found in this work, 7435 kg/ha. Soares et al. (1997) obtained 10488 kg DM/ha in oat and italian ryegrass pasture using 200 kg of N/ha of urea, which is higher than the value found in this work.

In the table 2, the percentage of components of forage matter evaluation is found as well as its respective averages in oat and italian ryegrass pasture under continuous grazing with heifers

in different levels of energetic supplementation. It was observed that the highest initial participation was the component oat leaf with an average of 43.86%. This participation was observed only in the first period, considerably decreasing from 08/05 on. Roso et al (1998), working with different mixtures, obtained 83.26% for oat in the initial period of pasture use. These results show the precocity of oat and its contribution for the initial production of forage when associated with italian ryegrass. It is also observable that the percentage participation of italian ryegrass leaf was relatively constant in all the evaluation periods. For the component italian ryegrass leaf, the highest percentage was observed in the treatment with no supplement. However, this percentage was decreasing according to the crescent levels of supplementation. These results show the selectiveness made by the animals when they receive any kind of supplement in their diet.

References

Alvim., M.J., Martins C.E., Botrel M. De A. and Cóser A.C. (1987). Efeito da fertilização nitrogenada sobre a produção de matéria seca e teor de proteína bruta do azevém (*Lolium multiflorum.* Lam.), nas condições da Zona da Mata de Minas Gerais. Revista da Sociedade Brasileira de Zootecnia.**16**:605-614.

IBGE – Instituto Brasileiro de Geografia e Estatística. (1996). Anuário Estatístico do Brasil, Rio de Janeiro. **56**.

Lupatini, G.C., Restle J., Ceretta M., Moojen E.L. and Bartz H.R. (1998). Avaliação da mistura de aveia preta e azevém sob pastejo submetida a níveis de nitrogênio. Pesquisa Agropecuária Brasileira. 1939-1943.

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. **34**:179 - 181.

Roso, C., Restle J., Filho D.C.A., Soares A.B. and Brondani I.L. (1998). Dinâmica e produção de forragem em misturas de gramíneas anuais de estação fria sob pastejo contínuo. Anais da 35ª Reunião Anual Soc. Bras. de Zootecnia. **35**:459 - 461.

SAS Institute Inc. SAS/SAST. (1989). Users' Guide.Version 6, Fourth ed, **2**, 846 p.

Table 1 – Accumulation rate (Kg DM/ha/day) per period and total production of dry matter for a pasture of oat and italian ryegrass under continuos grazing with heifers at different levels of energetic supplementation. Santa Maria, RS, 1999.

Treatment	Periods					Average	Total Production of DM	DS
	22/06 a 19/07	20/07 a 16/08	17/08 a 13/09	14/09 a 11/10	12/10 a 09/11			
No supplement	22.88	56.79	45.47	49.89	53.81	45.76	7067	NS
0.7% LW	32.14	58.44	56.23	57.13	71.56	55.10	7222	NS
1.4% LW	36.94	68.09	43.54	37.48	64.39	50.08	8137	NS
Average	30.65	61.10	48.41	48.16	63.25	50.31	7475	

Tukey ($P< 0.05$)

Table 2 – Percentage of forage matter components per evaluation and averages in oat and italian ryegrass pasture under continuous grazing with heifers at different levels of energetic supplementation. Santa Maria, RS, 1999.

Treatment	Components	Evaluations					Average
		08/07	05/08	01/09	28/09	28/10	
No supplement	oat leaf	35.47	4.00	0.82	1.03	0.00	8.26[a]
	oat stem	18.07	37.17	30.46	18.67	0.00	20.87[a]
	senescent matter for oat	9.23	10.03	4.90	2.90	0.00	5.41[a]
	italian ryegrass leaf	23.19	33.66	26.72	14.58	17.46	23.12[a]
	italian ryegrass stem	0.00	4.18	12.89	29.62	34.94	16.33[a]
	senescent matter for italian ryegrass	0.00	1.27	1.39	10.49	4.31	3.49[b]
	dead material	14.04	9.67	22.79	22.70	43.28	22.49
O.7 % LW	oat leaf	46.13	7.16	4.14	0.00	0.00	11.48[a]
	oat stem	28.19	32.82	16.94	6.36	0.00	16.86[a]
	senescent matter for oat	8.45	15.81	4.52	5.25	0.00	6.80[a]
	italian ryegrass leaf	19.06	27.56	19.04	25.22	20.86	22.35[a]
	italian ryegrass stem	0.00	4.02	12.14	39.13	37.68	18.59[a]
	senescent matter for italian ryegrass	0.00	2.50	14.10	11.56	4.85	6.60[a]
	dead material	1.59	13.42	29.10	12.46	36.59	18.63
1.4 % LW	oat leaf	49.98	7.91	0.69	0.00	0.00	11.72[a]
	oat stem	29.50	29.63	29.06	11.53	0.00	19.94[a]
	senescent matter for oat	5.01	19.2 5	2.67	2.46	0.00	5.87[a]
	italian ryegrass leaf	11.41	24.19	21.91	27.84	19.29	20.93[a]
	italian ryegrass stem	0.00	3.90	6.69	22.59	35.96	13.83[a]
	senescent matter for italian ryegrass	0.00	2.07	8.32	17.34	5.98	6.74[a]
	dead material	0.65	9.87	30.63	18.22	38.75	19.62

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