NATIVE PASTURE, FORAGE ON OFFER AND ANIMAL RESPONSE

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ABSTRACT
The 5-yr. study on the native pasture of southern Brazil (30° S) under levels of dry matter on offer (DMO) and continuous stocking, with five tester steers plus the put-and-takers per pasture and two field replications, indicated dry matter residues as dependent on DMO. Dry matter (DM) yield increased with DM residues, as well as dead plant parts. Daily liveweight gains (DLG) and gain ha^{-1} showed a curvilinear response to DMO and DM residues. Forage on offer levels promoting selective grazing enhance higher DLG and sustainable G. ha^{-1}, and contributes to the well-being of the ecosystem.

KEYWORDS
Native pasture, dry matter production, forage dry matter on offer, daily liveweight gain, gain per hectare, animal-days per hectare, grazing pressure

INTRODUCTION
The natural grazinglands of southern Brazil are the main feed resource for an equivalent to 15 million animal units. Socioeconomic factors are imposing pressures and jeopardizing the ability of the ecosystem due to increased rates of exploitation of this natural resource. The traditional pastoralism is the predominant strategy to utilize these pasturelands, since most ranchers think in terms of animal units carried on their pastures. As a consequence much of the forage harvested is used for maintenance. The ranching philosophy still is away from the ecosystem but there are indications suggesting attitudes toward its adoption. Fixed stocking rates are used throughout, and some grazing experiments were conducted in this fashion in the past. For the present days, Burns et al. (1989) suggested procedures for appropriate pasture evaluations under grazing, and Connolly (1976) suggested more than three levels of forage allowance to relate available forage to animal response. This research was conducted to develop human resources and to generate knowledge on native pasture utilization toward the potential of these grasslands.

MATERIAL AND METHODS
A 5-yr. study was conducted on native pasture dominated by *Paspalum notatum, Andropogon lateralis* and *Axonopus affinis* as a part of the 256 plant species on this pastureland, at the Estacao Experimental Agronomica - UFRGS, Eldorado do Sul (RS), Brazil, under a Cfa climate, 30° S, on a Red Yellow Podzolic soil type. The whole dry matter present was considered as forage feed, and four levels of dry matter on offer (DMO) were established: 4, 8, 12, and 16 kg dry matter per 100 kg liveweight d^{-1} (% LW), with two field replications, arranged in a randomized block design. The native pasture was sampled every 28 d to evaluate the rate of DM accumulation, using cages, and calculations of Campbell (1966) enriched the information given by the calibration disc meter (Jatenberg, 1970). Additional sampling was made for green and dead herbage, crude protein determination and in vitro organic matter digestibility. The pastures were grazed by five tester steers plus the put-and-takers needed to maintain the intended levels of forage on offer, from early spring up to the first frost in autumn.
The steers were weighed every 28 d, shrunk for the first and last weighing of the grazing season. During the winter period the pastures were grazed according to the forage DM available, but no measurements were taken on the pasture yield.

RESULTS AND DISCUSSION
There was a positive linear relationship between increase in residual DM ha^{-1} and DM accumulation rate (Table 1). The forage mass increased because the native pasture was more leniently defoliated as the levels of DMO increased. Although a greater proportion of the leaves were available for grazing, the stubble of the residual DM allowed better regrowth conditions for the pasture treatments. The increased frequency of defoliation at the 4% DMO left a stubble in disadvantage to capture sunlight. The ever present effects of heavy grazing and high stocking rates of the traditional pastoralism (Tothill et al. 1989) determine a meager scenario from natural pastures. Since moisture and temperature were not limiting, a higher residual DM mass would favor plant recovery.

The forage DM sampled from that standing forage mass for crude protein and in vitro organic matter digestibility were of low values, and might not support superior DLG per animal. This led to the suspicion that selective grazing might occur.

As a consequence of the increasing levels of DMO, a reduction in the liveweight carried and in animal-days grazing was observed for the pasture treatments.

However the minimum values would match the needs for a cow-calf unit ha^{-1} for most of the season. The rise in residual DM caused an increment in dead plant parts, that ranged from 15.6% to 35.3% of total DM, when moving from 4% to 16% DMO. This can promote shading at the tiller base, and lead to losses in photosynthetic efficiency (Hodgson, 1990).

These 5-yr. of grazing under defined DMO levels developed distinct pasture canopies, ranging from prostrate forms of growth on the heavier grazing pressures, to a coarse vegetation on the more leniently grazed treatments. The DLG and G ha^{-1} were strongly determined by the levels of DMO (Fig. 1), with a curvilinear response (Mott, 1960). This response curve may be related to the structural differences developed within the pastures profile and the constraints at the higher DMO, in allowing diets of increased forage quality and increase in forage DM consumption. The utilization of this natural resource agrees with Moore (1980), where one has to allow higher gains per animal at a stocking rate that assures these individual gains. With this in mind, one can better approach the ranching philosophy of grassland utilization and get away from the inefficiency of the high stocking rates of the traditional pastoralism.

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Table 1
Pasture response to dry matter on offer (% LW). Means of five years.

kg DM 100 kg LW^{-1} d^{-1}	4.0%	8.0%	12%	16%
Dry Matter ha^{-1} d^{-1}, kg	11.88	15.52	16.28	15.44
Dry Matter yield ha^{-1}, kg	2705.00	3488.20	3723.60	3393.00
Residual DM ha^{-1}, kg	582.60	996.60	1424.40	1900.00
Available DM ha^{-1}, kg	933.20	1448.40	1895.60	2343.40
Animal-days ha^{-1}	572.00	351.60	285.80	275.60

Figure 1
Relationships between DLG and G/ha with dry matter on offer (%LW) on the native pasture.