

EVALUATION UNDER GRAZING OF TWO *FESTUCA ARUNDINACIA* CULTIVARS WITH CONTRASTING GROWTH PATTERNS

A. Mazzanti¹ and M.H. Wade²

¹ EEA-INTA, CC 276, (7620) Balcarce, Bs As., Argentina

² Departamento de Producción Animal, Facultad de Cs Veterinarias, UNCPBA, Pinto 399, (7000) Tandil, Bs As., Argentina

ABSTRACT

Two cultivars of *Festuca arundinacea*, one of temperate origin (El Palenque: PAL) with higher spring and summer growth and one of North African origin (Maris Kasba: MK) with higher winter growth, were compared under grazing during three years. They were grazed continuously, using a "put and take" system, by young steers and the swards maintained at equal heights, but which varied slightly between seasons. Daily live weight gain (LWG) and instantaneous stocking rate (ISR) were used to estimate productivity per unit area. There was no difference between cultivars in LWG, but consistent and important differences in ISR: MK carrying and producing nearly 50% more steers/ha in winter than PAL, while in spring-summer PAL carried nearly 40% more. This strong interaction between cultivar and period meant that overall production on the two was similar.

KEYWORDS

Festuca arundinacea, comparison cultivars, grazing, contrasting growth patterns

INTRODUCTION

The contrasting growth patterns for mediterranean and temperate cultivars of Tall Fescue (*Festuca arundinacea*) found by Schiller and Lazenby (1975) in Australia have been confirmed under cutting in the SE of the Province of Buenos Aires (Balcarce, near the SE limit of the Humid Pampa; Mazzanti and Arosteguy, 1985). The mediterranean varieties were superior in winter and early spring, while the temperate ones were superior in late spring and summer and so annual productions were similar. In the extensive systems of meat production of Argentina the overall stocking rates are determined by winter carrying capacities, rather than by annual production, since only small amounts of forage reserves are harvested. Therefore even small increases in winter forage production may have a considerable influence on the productivity of these systems. In order to test whether these differences could be translated into meat production, a "put and take" continuous grazing trial was carried out, with close control of sward height (Hodgson, 1990).

METHODS

The cultivars used were the locally produced and widely utilised El Palenque (PAL) and Maris Kasba (MK), a British selection of a North African ecotype. The pastures were sown in 1982 together with *Trifolium repens* and *Lotus tenuis* in 1.45 ha paddocks, four for each cultivar, each randomly distributed in a complete block design. During the trials the swards were 90% *Festuca* and there was never more than 5% of the *Lotus* and no *Trifolium* remained. The trial was carried out almost continuously from 1991 to 1994, but the data to be reported consist of two periods during each of three years: the first of about 138 days from the month of May and the second continuing directly for about another 125 days to January/February. The animals used were Aberdeen Angus steers of about 150 to 170 kg live weight (LW) at the beginning of the first period. Liveweight gains were estimated by regression on weighings carried out at average intervals of between 16 and 23 days depending on year and on two "core" animals per replicate paddock. Sward heights were maintained at between: 6 and 8 cm in autumn, 4 and 6 cm in winter,

8 and 12 cm in spring and 6 and 8 cm in summer, measured with an "H.F.R.O." sward stick (Hodgson, 1990, p. 181). This was done by classical "put and take" techniques: removal and addition of "non-core" animals from a pool kept on similar pastures of *Festuca arundinacea* nearby. The initial analysis of productivity for the cultivar comparison has been done on the basis of using years as replicates, since no true replication could be done for daily live weight gain.

RESULTS AND DISCUSSION

Since sward heights were maintained at equivalent heights between cultivars in each season, the variations in ISR reflect the average pasture growth rates during the period indicated (Table 1). Such data are difficult to analyse statistically, nevertheless the trends are strong and clear in each year and on average there were 3 animals/ha in MK and against 2 in PAL in late autumn/winter. In the spring and summer this trend was reversed giving an average of 4 animals/ha in PAL, while it remained constant at 3 in MK. Apart from the winter of 1991, daily LWGs were between about 0.600 and 1.000 kg/head/d (Table 1), which are fairly high for the region, particularly those for winter in years 1992 and 1993. There was no evidence of a significant effect of cultivar upon daily LWG; this meant that the productivity in each period was primarily determined by average ISR. However in terms of productivity, since the trends in each season were consistently in opposition to one another, there was no clear advantage to either MK or PAL over the three years in terms of productivity: 471 against 508 kgLW/ha respectively, during the total 263 d period. This would nevertheless represent an overall advantage of about 8 % in favour of PAL, which on the basis of conventional cutting trials would be sufficient to permit PAL to be recommended as superior to MK. Obviously such a recommendation would ignore the strong interaction ($P > 0.05$) obtained between cultivars and periods in terms of both ISR and consequently productivity/ha: 49 % advantage to MK in winter and 39 % to PAL in spring and summer. The potential benefits of mediterranean ecotypes have been clearly demonstrated for the region.

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Table 1

Instantaneous stocking rates (ISR), daily weight gain (LWG) and weight gain per unit area (LWGA) by steers grazing two cultivars of *Festuca arundinacea* on a "put and take" basis in two periods during three years.

	Period 1 (138 d)		Period 2 (125 d)	
	M K	PAL	M K	PAL
1991/92				
ISR (steers/ha)	3.00	2.53	3.22	3.50
LWG (kg/head/d)	0.204	0.129	0.794	0.982
1992/93				
ISR (steers/ha)	2.74	1.58	2.90	4.40
LWG (kg/head/d)	0.602	0.699	0.727	0.687
1993/94				
ISR (steers/ha)	3.45	2.11	2.78	4.04
LWG (kg/head/d)	0.627	0.725	0.631	0.608
Mean of 3 years				
ISR (steers/ha)	3.06 (± 0.38)	2.07 (± 0.48)	2.97 (± 0.21)	3.98 (± 0.34)
LWG (kg/head/d)	0.478 (± 0.24)	0.518 (± 0.34)	0.717 (± 0.08)	0.759 (± 0.20)
LWGA (kg/ha/d)	1.47 (± 0.74)	0.99 (± 0.61)	2.14 (± 0.38)	2.97 (± 0.50)
Weight gain				
(kg/ha/period)	203.5	136.2	267.5	371.5
	(+ 49 %)	(+ 39 %)		