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Forage allowance and cow genotype, tools to increase animal production in native pastures

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Introduction

In eight plots (four per block) the effects of two FA per two cow genotypes were tested from August 2007 to March 2010, on a Campos grassland (major species were *Axonopus affinis*, *Oxalis* sp., *Cyperus* sp., *Cynodon dactylon*, *Eryngium nudicaule*, *Gaudinia fragilis*, *Chevreulia sarmentosa*, *Stipa setigera*, *Paspalum notatum* and *Coelorhachis selloana*) in Uruguay (32º 20` S, 54º 26` W). Forage allowance varied seasonally, in HIGH (5, 3, 4 and 4 kg DM/kg LW) and LOW (3, 3, 2 and 2 kg DM/kg LW) during autumn, winter, spring and summer; respectively. Continuous stocking method was applied throughout the year, with FA adjusted monthly, using the "put and take method" (Mott and Lucas 1952). Thirty PURE (Hereford and Aberdeen Angus) and thirty CROSS (F1 reciprocal Hereford and Angus crosses) multiparous cows, aged four to eight years with normal calving and pregnancies, were randomly assigned to the plots. Cow LW and BCS were measured monthly and in key moments such as calving and at the beginning of the breeding season. BCS was visually assigned on a scale ranking from 1 = very thin to 8 = very fat (Vizcarra *et al.* 1986). Cows did not breed during summer 2010. Data of cow LW and BCS and calf weight at weaning (94 ± 31 d) were analyzed using the MIXED procedure (SAS Institute, Cary, NC, USA, 2002). The model included FA, cow genotype, year and their interactions as fixed effects, block as random effect, and for cow BCS at the beginning of the breeding season, cow BCS at calving was used as covariate. Tukey–Kramer test were conducted for mean separation ($\alpha = 0.05$).

Results

Cow BCS at calving was affected by the interaction between forage allowance x year ($P<0.01$) and cow genotype x year ($P<0.01$), but not by forage allowance x cow genotype ($P>0.5$). Cow BCS at calving was higher in HIGH than in LOW only in 2009, after a severe drought. However, cow genotype affected BCS at calving during 2008 (Fig. 1). Cow BCS at the beginning of the breeding season was affected ($P<0.05$) by forage allowance during 2008 (start of the drought) and tended to be significant during 2007 (3 months after the beginning of the differential FA). Cow BCS at the beginning of breeding was affected by BCS from the previous calving. Reproductive rate is highly influenced by both cow BCS at calving (that affects the length of the anoestrus period), and BCS at the beginning of the breeding season that interacts with BCS at calving to determine early and total pregnancy rate (Soca *et al.* 2013). On the other hand calf weight at weaning was higher in HIGH than in LOW (120 vs 104 ± 2 kg) and in CROSS than in PURE (119 vs 105 ± 2 kg), which can be explained by the higher milk production in HIGH and CROSS cows (Gutierrez *et al.* 2012). There was no interaction of FA x cow genotype, but effects were additive, being 96.6, 112, 114 and 126 ± 2 kg for LOW-PURE, LOW-CROSS, HIGH-PURE and HIGH-CROSS respectively.

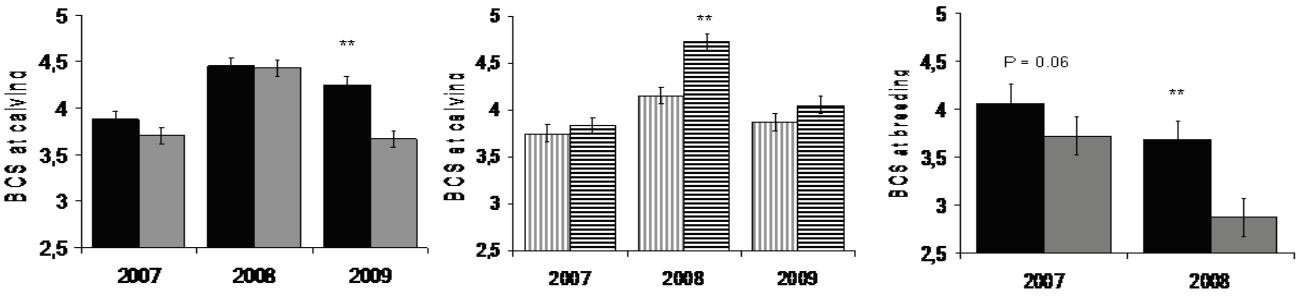

Figure 1. Body condition score (BCS) of purebred (▯) and crossbred (▬) cows under HIGH (■) or LOW (▩) forage allowance at calving or beginning of the breeding season. Mean differences (Tukey-Kramer) are indicated with **.

Conclusions

Our works highlights the opportunity to enhance the BCS at calving and at the beginning of the breeding and the weight of calves at weaning through the use of FA and cow genotype. Differences between HIGH and LOW FA were not associated with a difference stocking rate (Do Carmo *et al.* 2013 at this congress).

References

Barlow R, Hearnshaw H, Arthur PF, Darnell RE, (1994) Evaluation of Hereford and first cross cows on three pasture systems. Calf growth and reproductive performance of young cows. *Journal of Agricultural Science* **122**, 121-129.

Gutierrez V, Espasandin AC, Astessiano AL, Casal A, Lopez-Mazz C, Carriquiry M (2012) Calf foetal and early life nutrition on grazing conditions: metabolic and endocrine profiles and body composition during the growing phase. *Journal of Animal Physiology and Animal Nutrition* DOI:10.1111/j.1439-0396.2012.01314.x

Jenkins TG and Ferrell CL (1994) Productivity through weaning of nine breeds of cattle under varying feed availabilities: I. Initial evaluation. *Journal of Animal Science* **72**, 2787-2797.

Maraschin, GE, Moojen EL, Escoteguy CMD, Correa L, Apezteguia ES, Boldrini II (1997). Native pasture, forage on offer and animal response: Proceeding of the 18th International Grassland Congress, Winnipeg and Saskatoon, Canada, 8 - 19 June 1997. (Eds Buchanan-Smith JG, Bailey LD, McCaughey, P) pp 27-29.

Mott GO and Lucas HL (1952). The design, conduct, and interpretation of grazing trials on cultivated and improved pastures: *Proceedings of the Sixth International Grassland Congress.* Pennsylvania, USA, 17 - 23 August 1952. (Eds Pennsylvania State College). pp 1380-1385.

Soca P, Carriquiry M, Keisler DH, Claramunt M, Do Carmo M, Olivera-Muzante J, Rodriguez M, Meikle A (2013) Reproductive and productive response to suckling restriction and dietary flushing in primiparous grazing beef cows. *Animal Production Science* **53**, 283-291.

Sollenberger LE, Moore JE, Allen VG, Pedreira CGS (2005) Reporting forage allowance in grazing experiments. *Crop Science* **45**, 896-900.

Vizcarra JA, Ibañez W, Orcasberro R (1986) Repetibilidad y reproducibilidad de dos escalas para estimar la condición corporal de vacas Hereford. *Investigaciones Agronómicas* **7**, 45-47.