Beef Heifers Performance under Continuous Grazing on Modified Grassland in Argentina Flooding Pampa

María L. Agnelli
*Universidad Nacional de La Plata, Argentina*

Roberto O. Refi
*Universidad Nacional de La Plata, Argentina*

Estrella M. Oyhamburu
*Universidad Nacional de La Plata, Argentina*

Mario C. Ursino
*Universidad Nacional de La Plata, Argentina*

Follow this and additional works at: [https://uknowledge.uky.edu/igc](https://uknowledge.uky.edu/igc)

Part of the [Plant Sciences Commons](https://uknowledge.uky.edu/psc), and the [Soil Science Commons](https://uknowledge.uky.edu/ssc)

This document is available at [https://uknowledge.uky.edu/igc/22/1-12/16](https://uknowledge.uky.edu/igc/22/1-12/16)

The XXII International Grassland Congress (Revitalising Grasslands to Sustain Our Communities) took place in Sydney, Australia from September 15 through September 19, 2013. Proceedings Editors: David L. Michalk, Geoffrey D. Millar, Warwick B. Badgery, and Kim M. Broadfoot

Publisher: New South Wales Department of Primary Industry, Kite St., Orange New South Wales, Australia

This Event is brought to you for free and open access by the Plant and Soil Sciences at UKnowledge. It has been accepted for inclusion in International Grassland Congress Proceedings by an authorized administrator of UKnowledge. For more information, please contact UKnowledge@lsv.uky.edu.
Beef heifers performance under continuous grazing on modified grassland in Argentina Flooding Pampa

María L Agnelli, Roberto O Refi, Estrella M Oyhamburu and Mario C Ursino

Contact email: agnelli@agro.unlp.edu.ar

Keywords: Stocking rate, ADWG, herbage biomass.

Introduction

The Salado river basin is the main beef cattle breeding region of Argentina. It is a flat flooding area with poor slopes (<3%). Their soils are Natracuoles, Natraqualfes and Argiacuoles. The grasslands are predominately continuously grazed and with a set stocking rate cow – calf system. Stocking rate and grazing pressure are two core variables that directly affect animal production. Reduced animal performance is believed to be due to poor grazing management. During 2010, 2011 and 2012 an experiment on the effect of stocking rate on animal growth and body condition with Angus heifers continuously grazing annual winter grasses, was carried out. Previous studies have demonstrated the practicability of producing replacement females with this management (Carrillo 2001; Eirin et al. 2011; Agnelli et al. 2011) that involves mesothermic grasslands modification into self sown winter grasses by using glyphosate and other herbicides (Oyhamburu et al. 2000, Rodriguez and Jacobo 2010).

The aim of this study was to establish the stocking rate that optimizes beef rearing heifer’s performance for early mating.

Methods

The experiment was conducted at “El Amanecer” farm (UNLP), located in Vieytes, Argentina (57°07’ W; 35°01’S). A modified mesophytes grassland was developed by the application of 5 l/ha of glyphosate and 1 l/ha of 2.4-D to promote germination and establishment of winter annual species mainly Lolium multiflorum, Bromus catharticus and Gaudinia fragilis. Continuous grazing was performed from early June to late October in 2010 and 2011, and from mid-May to late October in 2012. Frame score 3 rearing heifers for early mating were used. The initial body weight was 164.3 ± 0.22 kg in 2010, 169.5 ± 0.20 kg in 2011 and 186.0 ± 0.20 kg in 2012. Three year average of initial grassland height was 18.4 ± 1.7 cm and initial total herbage biomass was 1905.1 ± 124.1 kg/ha. Treatments expressed in cow equivalent (EV) (Cocimano et al. 1975) were: high stocking rate (HSR), where the grazing area was adjusted to an average load of 3 EV/ha (4.4 animals/ha) and low stocking rate (LSR) where we used an average load of 2 EV/ha (3 animals/ha). A randomized block design with three replications in space and 6 animals per experimental unit was designed. Every 14 days we measured the total herbage biomass (THB), the height of defoliated tillers (DT) and animal live weight (LW), and estimated the daily live weight gain (DWG) and body condition score (BCS). All results were analyzed by ANOVA and Tukey test.

Results and Discussion

Weather conditions during the three year experiment showed significant variations in autumn-winter rainfall, with possible impact on primary production and animal response. These oscillations are common in the region (Table 1). The combination of a very dry autumn, and winter rainfall excess in 2012, added to a higher initial grazing pressure, resulted in a significant reduction in the herbage live biomass. Consequently, DWG in 2012 was 20 kg higher than the average of previous years, and these animals ended with same LW of 2010 because of the prevailing environmental conditions (Table 1). The average THB was 70 and 94 % higher in 2010 and 2011 than in 2012, while DT showed similar behavior but with minor differences (Table 2). The initial THB was 1443.6 kg DM/ha in 2012, being lower (P<0.001) than 2010 and 2011 (2112.2 and 2148.9 kg DM/ha respectively). The LW was not influenced by initial body weight, which in 2012 was 20 kg higher than the average of previous years, and these animals ended with same LW of 2010 because of the prevailing environmental conditions (Table 1). The combination of a very dry autumn, and winter rainfall excess in 2012, added to a higher initial grazing pressure, resulted in a significant reduction in the herbage live biomass. Consequently, DWG in 2012 was 20 kg higher than the average of previous years, and these animals ended with same LW of 2010 because of the prevailing environmental conditions (Table 1). The combination of a very dry autumn, and winter rainfall excess in 2012, added to a higher initial grazing pressure, resulted in a significant reduction in the herbage live biomass. Consequently, DWG in 2012 was 20 kg higher than the average of previous years, and these animals ended with same LW of 2010 because of the prevailing environmental conditions (Table 1). The combination of a very dry autumn, and winter rainfall excess in 2012, added to a higher initial grazing pressure, resulted in a significant reduction in the herbage live biomass. Consequently, DWG in 2012 was 20 kg higher than the average of previous years, and these animals ended with same LW of 2010 because of the prevailing environmental conditions (Table 1). The combination of a very dry autumn, and winter rainfall excess in 2012, added to a higher initial grazing pressure, resulted in a significant reduction in the herbage live biomass. Consequently, DWG in 2012 was 20 kg higher than the average of previous years, and these animals ended with same LW of 2010 because of the prevailing environmental conditions (Table 1).

Table 1. Rainfall (mm) during the experimental period.

<table>
<thead>
<tr>
<th>Year</th>
<th>March - April</th>
<th>May - June</th>
<th>July</th>
<th>August</th>
<th>September - October</th>
<th>Total Period</th>
</tr>
</thead>
<tbody>
<tr>
<td>2010</td>
<td>170</td>
<td>210</td>
<td>107</td>
<td>22</td>
<td>155</td>
<td>664</td>
</tr>
<tr>
<td>2011</td>
<td>66</td>
<td>185</td>
<td>72</td>
<td>15</td>
<td>81</td>
<td>519</td>
</tr>
<tr>
<td>2012</td>
<td>100</td>
<td>55</td>
<td>5</td>
<td>185</td>
<td>149</td>
<td>494</td>
</tr>
</tbody>
</table>

© 2013 Proceedings of the 22nd International Grassland Congress
Table 2. Effects of stocking rate, year and season on studied variables.

<table>
<thead>
<tr>
<th>Parameters</th>
<th>Treatments</th>
<th>Years</th>
<th>Seasons</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>HSR</td>
<td>LSR</td>
<td>2010</td>
</tr>
<tr>
<td>THB (kgDM/ha) (*)</td>
<td>1317 ± 45 a</td>
<td>1827 ± 45 b</td>
<td>1717 ± 55 b</td>
</tr>
<tr>
<td>DT (cm) (*)</td>
<td>6.29 ± 0.23 a</td>
<td>8.70 ± 0.23b</td>
<td>7.35 ± 0.40 b</td>
</tr>
<tr>
<td>LW (kg) (*)</td>
<td>215.6 ± 1.0 a</td>
<td>224.6 ± 1.0 b</td>
<td>215.9 ± 1.3 a</td>
</tr>
<tr>
<td>DWG (kg) (*)</td>
<td>0.44 ± 0.03 a</td>
<td>0.55 ± 0.03 b</td>
<td>0.65 ± 0.04 b</td>
</tr>
<tr>
<td>BCS (*)</td>
<td>3.52 ± 0.02 a</td>
<td>3.59 ± 0.02 b</td>
<td>3.81 ± 0.02 b</td>
</tr>
</tbody>
</table>

(*) Means with different letters differ at $P = 0.0001$.

Table 3. Comparison of variables at the end of the experiment, three-year average.

<table>
<thead>
<tr>
<th>Treatments</th>
<th>THB (kgDM) (*)</th>
<th>DT (cm) (*)</th>
<th>LW (kg) (*)</th>
<th>BCS (*)</th>
</tr>
</thead>
<tbody>
<tr>
<td>HSR</td>
<td>1313 ± 113 a</td>
<td>4.34 ± 0.30 a</td>
<td>244.8 ± 4.2 a</td>
<td>3.80 ± 0.05 a</td>
</tr>
<tr>
<td>LSR</td>
<td>1903 ± 113 b</td>
<td>6.19 ± 0.30 b</td>
<td>262.2 ± 4.4 b</td>
<td>3.91 ± 0.06 a</td>
</tr>
</tbody>
</table>

(*) Means with different letters differ at $P = 0.01$.

Conclusions

The promotion of winter species using herbicides produces a suitable resource for the rearing heifers. LSR allowed reaching the threshold weight for early mating in a high percentage of rearing animals. HSR allowed sustaining high stocking rate in winter, the possibilities of improving the efficient use of spring forage production and high production of meat. The productive planning was sensitive to high environmental variability expressed through the year effect.

Acknowledgments

The authors wish to acknowledge National University of La Plata, Buenos Aires, Argentina.

References


