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The XXII International Grassland Congress (Revitalising Grasslands to Sustain Our Communities) took place in Sydney, Australia from September 15 through September 19, 2013.


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

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Greenhouse sheds for increasing livestock bodyweight in Taipusi, Inner Mongolia

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Keywords: Winter grazing, livestock production, greenhouse sheds.

Introduction
Grasslands in many developing countries around the world are suffering from degradation, principally as a result of greater grazing pressure from increasing livestock numbers (Kemp and Michalk 2007). In Taipusi County (41\textdegree 35’ to 42\textdegree 10’N; 114\textdegree 51’ to 115\textdegree 49’E) of the Inner Mongolia Autonomous Region, traditional winter grazing on pastures with virtually no herbage mass is thought to be exacerbating the grassland condition, as well as being counterproductive to animal production (Zheng \textit{et al.} 2010). This paper describes a feasibility study of utilizing existing sheds to house sheep during the winter.

Materials and Methods
Forty Mongolian Mutton Cross ewes from two farms (Group A) grazed pastures, the traditional method throughout the winter of 2009 and the spring of 2010 (from 28 November to 20 May). Another 40 ewes of the same breed (Group B) were kept inside greenhouse sheds during the same period. The greenhouses were made by replacing the original brick roof of existing brick-walled sheds with a new roof made of daylight tiles. An electric furnace was placed in the greenhouse to improve the night temperature.

Results and Discussion
Group A ewes lost on average 5 kg more bodyweight than Group B ewes during the winter (P<0.05, Table 1). Group B lambs gained on average 2.26 kg more bodyweight than Group A lambs during the experimental period (P<0.05, Table 2).

Conclusions
The results show that changing the traditional grazing management and using greenhouse sheds during winter and early spring will increase the bodyweight of ewes and lambs. The proposed strategy has a potential to achieve higher animal productivity, especially improve night temperatures of the greenhouse sheds. Options such as glass walls and in room heating are currently being investigated, and then the costs and benefits of the traditional and shed systems will be evaluated.

Acknowledgement
This research was funded by the Australian Centre for International Agricultural Research (LPS/2001/094).

References


Table 1. Body weight changes of ewes in greenhouse sheds and grazing system.

<table>
<thead>
<tr>
<th>Month</th>
<th>Group A (n=40)</th>
<th>Group B (n=40)</th>
<th>T Test</th>
</tr>
</thead>
<tbody>
<tr>
<td>November</td>
<td>44.28±1.04</td>
<td>45.39±1.22</td>
<td>P&gt;0.05</td>
</tr>
<tr>
<td>December</td>
<td>42.74±0.79</td>
<td>42.25±1.32</td>
<td>P&gt;0.05</td>
</tr>
<tr>
<td>January</td>
<td>42.58±0.89</td>
<td>47.53±0.97</td>
<td>P&lt;0.05</td>
</tr>
<tr>
<td>February</td>
<td>44.42±0.93</td>
<td>50.05±1.11</td>
<td>P&lt;0.05</td>
</tr>
<tr>
<td>March</td>
<td>37.07±0.83</td>
<td>43.51±1.08</td>
<td>P&lt;0.05</td>
</tr>
<tr>
<td>April</td>
<td>32.57±0.72</td>
<td>38.75±0.94</td>
<td>P&lt;0.05</td>
</tr>
<tr>
<td>Bodyweight gain (kg)</td>
<td>-11.7</td>
<td>-6.6</td>
<td>P&lt;0.05</td>
</tr>
</tbody>
</table>

Table 2. The birth weight, one-month weight and weight gain of lamb in greenhouse sheds and grazing system.

<table>
<thead>
<tr>
<th></th>
<th>Group A</th>
<th>Group B</th>
<th>T Test</th>
</tr>
</thead>
<tbody>
<tr>
<td>Birth weight (kg)</td>
<td>3.35±0.07</td>
<td>4.10±0.15</td>
<td>P&lt;0.05</td>
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<td>Month weight (kg)</td>
<td>11.34±0.44</td>
<td>14.34±0.86</td>
<td>P&lt;0.05</td>
</tr>
<tr>
<td>Weight gain (kg)</td>
<td>7.99±0.43</td>
<td>10.25±0.74</td>
<td>P&lt;0.05</td>
</tr>
</tbody>
</table>