Impact of Grazing Densities, Animal Types, Supplemental Feedings on Forest-Steppe Pasture

Seishi Yamasaki
Japan International Research Center for Agricultural Sciences, Japan

Katsuhisa Shimoda
Japan International Research Center for Agricultural Sciences, Japan

Bayaraa Baasanjalbuu
Japan International Research Center for Agricultural Sciences, Japan

L. Narangerel
Japan International Research Center for Agricultural Sciences, Japan

D. Pagmaa
Japan International Research Center for Agricultural Sciences, Japan

See next page for additional authors

The 21st International Grassland Congress / 8th International Rangeland Congress took place in Hohhot, China from June 29 through July 5, 2008.

Proceedings edited by Organizing Committee of 2008 IGC/IRC Conference

Published by Guangdong People's Publishing House

Presenter Information

Seishi Yamasaki, Katsuhisa Shimoda, Bayaraa Baasanjalbuu, L. Narangerel, D. Pagmaa, A. Hirano, K. Shindo, N. Togtokhbayar, and K. Toriyama

Impact of grazing densities , animal types , supplemental feedings on forest-steppe pasture

S .Yamasaki , K .Shimoda , B .Baasanjalbuu , L .Narangerel , D .Pagmaa , A .Hirano , K .Shindo , N .Togtokhbayar , K . Toriyama
Animal Production and Grassland Division , Japan International Research Center for Agricultural Sciences (JIRCAS) , Tsukuba 305-8686 , Japan . E-mail : sshymsk@jircas .affrc .go .jp

Key words : *Artemisia frigida* , grazing pressure , herbage consumption , pasture degradation , *Stipa krylovii*

Introduction The pastoral livestock production system carried on in natural open pastures in Mongolia has played a crucial role in the domestic economy . Socio-economic reform included the introduction of a market economy , which was accelerated in the early 1990s , exerted a large influence on the system : the livestock population continued to increase ; it reached historical high 32 .9 million in 1998 ; and the number of herders continued to increase in the 1990s . In the course of the changing , excessive grazing in natural pastures especially in and around centers was alarming as herders and livestock were more densely concentrated there than in other areas (Enkhamgalan , 1995) . These situations , which have continued until today , may demonstrate the decreasing sustainability of the production system . Then , JIRCAS and Mongolian State University of Agriculture have been conducting a project entitled Development of a Sustainable Agro-Pastoral System in the Dry Areas of Northeast Asia (Apr 2006-Mar 2011)" to solve conflicting problems , such as pasture conservation , and increasing or maintaining the herders' income . An experiment was started in/nearby the animal and human population center . This paper introduces the experiment , and some of its first-year results are presented .

Material and methods The experiment was conducted between 31 May and 9 Oct , 2007 at *Bornuur* district (N48°41′ , E106° 15′) , *Tuv* prefecture of Mongolia , where the vegetative type is forest-steppe . It is during this time of year that many of herders move their habitation from the winter-spring to the summer-autumn camp site . A gently sloped , but flat , land with an area of nearly 30 ha was chosen for the experiment . *Stipa krylovii* , *Artemisia frigida* were dominant uniformly at the site . Twenty-three ha of the area was fenced using cement and tree poles , and barbed wire ; then the area was divided into nine paddocks using the same materials as follows : one cattle paddock (8 ha , C) , one goat paddock (1 .8 ha , G) , six sheep paddocks (1 ha , SH ; 4 ha , SL ; and four paddocks of 2 ha , SE , SM , S0 .5 and S1 .0) and one no grazing paddock (C0) . Four cattle , six goats and six sheep with an average initial bodyweight (BW) of 220 .6 (standard deviation (STD) , 15 .3) , 28 .9 (1 .9) and 36 .6 (3 . 0) , respectively , grazed in each of paddocks . The sheep in S0 .5 and S1 .0 were supplementary fed wheat bran in the amount of 0 .5% and 1 .0% /BW/d , respectively . The cattle were weighed every month , and the sheep and goats were weighed weekly . All animals were weighed at the end of the experiment . The SE was divided into 10 paddocks using electric fences , and the animals were rotated every week . The apparent herbage consumption by the SE sheep was determined by calculating the difference between the pre-and post-grazing herbage masses . The amount was also measured by the protect cage method in the C , G , SM and S0 .5 every month and at the end of the experiment . A vegetation survey measuring plant height , coverage , etc . was performed at 10 fixed locations (100cm×100cm) in each of the fenced areas and outside of them , from 1 to 4 August , to determine the successive changing of the pastures with the different grazing treatments .

Results *Stipa spp* . and *Artemisia spp* . occupied a high proportion of the total consumption during the experiment (Table 1) . The apparent herbage consumption increased during the course of the seasons (Table 2) . And , *Artemisia spp* . , which are considered indicative of pasture degradation , were eaten by sheep , irrespective of the season . The average final BW of the sheep in each paddock was 40 .3 (SH) , 42 .2 (SM) , 44 .4 (SL) , 45 .8 (S0 .5) and 44 .1 (S1 .0) , respectively . No significant differences were found to result from the effect of grazing density (pooled STD=3 .185 ; P=0 .120) and supplemental feeding (2 .803 ; 0 .121) , though there were differences in the magnitudes .

Table 1 *Herbage Production and consumption during the experimental period in 2007 , kgDM/ha .*

	Stipa spp .	*Artemisia spp .*	Others	Total
Consumption	328 .3	296 .8	130 .2	755 .3
Remain (9 Oct)	5 .7	5 .4	1 .8	12 .8
Production	334 .0	302 .2	132 .0	768 .1

Table 2 *Herbage consumption by seasons in 2007 , kgDM/ 100kgBW/d .*

	Stipa spp .	*Artemisia spp .*	Others	Total
Jun	1 .07	0 .84	0 .76	2 .66
Jul	2 .09	1 .96	1 .24	5 .29
Aug	0 .67	2 .42	1 .24	4 .32
Sep	4 .34	2 .18	0 .22	6 .74
Oct	3 .12	2 .93	0 .99	7 .05

We will continue this experiment until 2010 , and the data in the first and following years would be presented later on . The data is expected to be a basic data to contribute to improve the pastoral livestock production system in the region .

Reference

Enkhamgalan , A . (1995) . The essential problems of Mongolian pastoral reform . Land Reform . 119-124 .