

Technical Report No. 149
GRAZING BEHAVIOR OF BISON AND CATTLE
ON A SHORTGRASS PRAIRIE

Kelly L. Sparks
Natural Resource Ecology Laboratory
Colorado State University
Fort Collins, Colorado

GRASSLAND BIOME
U.S. International Biological Program

May 1972

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ABSTRACT

Two 24-hour observations were made on a mixed species herd of cattle and bison: one on a heavily grazed pasture and the other on a lightly grazed pasture. Only two main activities were recorded, resting and grazing. No large species differences were recorded in the amounts of time spent grazing or resting. Several important interactions were observed, the most notable being that the bison were dominant over the cattle in selection of grazing areas, bedding grounds, and water holes. Other differences included the more protective nature of bison for the individuals in the herd and their unwillingness to be separated from the herd.

INTRODUCTION

The American bison was once one of the most numerous herbivores found on the Great Plains. The great size of the individuals and the magnitude of these herds made a profound impact upon the grassland ranges where they grazed. In those days, one of the bison's main competitors was the antelope, and since the grazing similarity between bison and antelope is relatively low (about .32, Peden and Rice, 1971) the bison had little competition on the ranges they roamed. However, with the coming of the white man and his domestic cattle, fences, and cities, the bison were pushed off their native range to selected parks and private pastures.

If the bison are to be managed successfully with cattle, the grazing behavior and interactions of these species should be known. Several reports have already been written on the grazing behavior and activities of cattle. Dwyer (1961) reported in detail on the activities of cattle on an Oklahoma range, and Herbel and Nelson (1966) compared the grazing activities of two breeds of cattle on a semidesert grassland in southern New Mexico.

In an effort to determine the major peaks of grazing and resting periods of two species of herbivores, a study was made of bison and cattle. This study was part of a dietary and digestion comparison of the two species presently being conducted by the International Biological Program. The study area is a shortgrass prairie currently under the management of the Central Plains Experiment Range (ARS), near Nunn, Colorado, and is part of the Pawnee Site.

The topography consists of rolling hills with mainly sandy loam soils. The upland sites are dominated by blue grama (*Bouteloua gracilis*) and buffalo grass (*Buchloe dactyloides*). The bottomlands are primarily western wheatgrass (*Agropyron smithii*). The major shrubs or forbs include rabbit brush (*Chrysothamnus nauseosus*) and broom snakeweed (*Gutierrezia sarothrae*). Prickly-pear cactus (*Opuntia polyacantha*) also has a sizable ground cover in the study plot.

The climate of this area is semiarid with approximately 12 inches of rainfall/year. The temperatures at the time of study ranged from 50°F at night to 90°F during the day. A more complete description of the site may be found in Technical Report No. 1 (Jameson, 1969).

METHODS

One 24-hour observation was made in a 54-acre lightly grazed pasture, and one was made in a 27-acre heavily grazed pasture. The animals observed included seven esophageal fistulated cattle and seven esophageal or rumen fistulated bison. Both groups were grazing in the same pasture at the time of observations. Every 30 minutes each group was checked for such major activities as grazing and resting. Resting included the time the animals spent ruminating, standing idle, or resting while around the water tank. Other activities noted included distances walked, general behavior, and distinctive interactions. Both herds were used to men walking around during the day; however, caution had to be taken when approaching the bison at night to avoid spooking them.

RESULTS

The bison and cattle observed in this study seemed to show no major differences in the total time spent grazing and resting. Table 1 shows a summary of the average amount of time each species spent on the major categories of grazing activities for both the lightly and heavily grazed pastures. The cattle grazed about 11 hours in the heavily grazed pasture but only $9\frac{1}{2}$ hours in the lightly grazed pasture. These results seem to be fairly close to the $11\frac{1}{2}$ hours reported by Peterson and Woolfolk (1955) and the 7 to 8 hours reported by Wallace and Kennedy (1944) for cattle in a good pasture. The bison grazed slightly more in the heavily grazed pasture, 12 hours, and slightly less in the light pasture, 8 hours. The figures were obtained by averaging the time each herd spent on a particular activity for each pasture.

While observing the activities of each species, several interesting interactions between the species were observed. In ALL cases, the bison were the dominant animals. The bison would sometimes water, then lie around the tank at times for an hour or more while the cattle waited for a chance to drink. If a cow happened to get too close, she was promptly chased off. Another striking difference between the cows and bison was the herd radius while grazing and resting. The bison stayed in very tight groups almost all the time, while the cattle were more spread out while grazing and sometimes were separated into two distinct groups. If one bison ~~were~~^{was} alarmed, the other bison would quickly come to the assistance of the one that was alarmed. The cows on the other hand showed no such response.

Table 1. Comparative grazing and resting times of cattle and bison.

Grazing Treatment	Species	Period	Available Time (hr)	Grazing	Resting
Light	Cattle	Day	15.5	8.0	6.0
		Night	8.5	1.5	8.5
		Total	24.0	9.5	14.5
	Bison	Day	15.5	8.0	6.0
		Night	8.5	0.0	10.0
		Total	24.0	8.0	16.0
Heavy	Cattle	Day	15.5	9.0	6.5
		Night	8.5	2.0	6.5
		Total	24.0	11.0	13.0
	Bison	Day	15.5	9.0	6.5
		Night	8.5	3.0	5.5
		Total	24.0	12.0	12.0
Mean	Cattle	Day	15.5	8.5	6.25
		Night	8.5	1.75	7.5
		Total	24.0	10.25	13.75
	Bison	Day	15.5	8.5	6.25
		Night	8.5	1.5	7.75
		Total	24.0	10.0	14.0

While actively grazing, the bison did not cover much territory, while the cows would walk long distances when grazing, especially in the heavily grazed pasture. Bison, on the other hand, walked more when not grazing, and the total distances walked (grazing distance plus travel distance) appeared to be about the same.

DISCUSSION

It has been found that dual use of some ranges could increase the amount of animal units that these ranges could support (Cook, 1954). If such dual use is to be properly managed, a good idea of grazing activities and interactions of the grazing species should be known. This study compared the activities of cattle and bison over 24-hour periods. Two types of study pastures were used: a 54-acre lightly grazed pasture and a 27-acre heavily grazed pasture. The results suggest that there are no major differences between species in the time spent grazing and resting. It appears that both cows and bison grazed 2 to 2½ hours longer in the heavily grazed than in the lightly grazed pasture. This was largely accounted for by an increase in nighttime grazing. The results seem to agree with those reported by the other investigators already mentioned. It must be kept in mind, however, that differences may be due to the type of range and the forage available.

The major peaks of grazing and resting were as follows. The animals usually arose just prior to sunrise and grazed for about 3 hours. They would then lie down until early midmorning. The animals would again get up and graze fairly actively until early afternoon at which time they rested.

The hotter the day, the longer the afternoon rest lasted. The last 3 or 4 hours of daylight seemed to be the period of most vigorous grazing. The cows bedded down almost immediately after sundown, but the bison usually kept grazing for another 30 minutes to 1 hour. The last grazing period usually began just after midnight and lasted 1 to 2 hours. The bison did not always engage in night grazing. Drinking usually occurred after their early morning grazing and sometimes during or before their afternoon and evening grazing periods.

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