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## Grazing behaviors of goats and sheep in winter and spring in a desert steppe

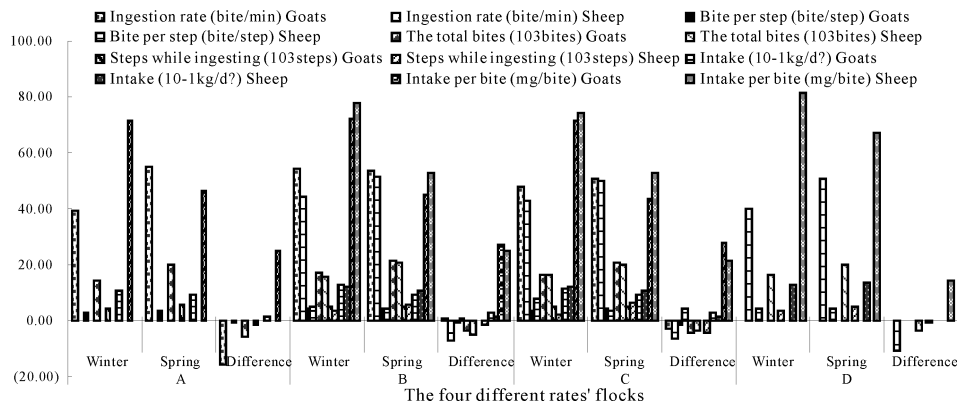
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**Key words :** *Stipa breviflora* desert steppe , grazing behavior , goat , sheep , winter and spring

**Introduction** Grazing ecology was to research how the herbivore to produce and realize grazing behaviors and strategies , to utilize and convert herbage resources efficiently , as well as to maintain permanent and productive ecological function of grassland ecosystem . With the development of grazing ecology , grazing behaviors were considered as the most active field in grazing ecology , even in grassland ecology . Meanwhile , grazing behaviors were not only the important factors which influencing the process from primary production to secondary production , determining livestock productivity , but also one of the important indices of evaluating grazing system and grassland conditions , and the important criteria of establishing grazing system and improving the level of grazing management .

**Materials and methods** The dynamic variation of grazing behavior parameters of grazing goats and sheep in the four flocks with different percentages of goat and sheep in winter and spring were observed in detail with full-time in the *Stipa breviflora* desert steppe in Inner Mongolia (41°47' N , 111°53' E , average annual precipitation=280 mm , elevation=1960~2800 asl , soil=light chestnut) . The ratio of goats to sheep of the flocks were 1 : 0 (A) , 1 : 1 (B) , 1 : 3 (C) and 0 : 1 (D) respectively . The goat and sheep for trials in the four flocks with healthy , similar body weight and identical age were observed continuously for two days for each observing time .

**Results** The dynamic variations of grazing behaviors both for goats and sheep from winter to spring were in the similar trends . Comparing with winter , the ingesting rate in spring increased evidently , intake per bite decreased more than 15% ( max 40% ) , and daily intake decreased . However , the total bites and walking steps of whole day grazing all increased . Daily intake of goats and sheep in B and C reduced over 10% , the goats' daily intake in A decreased 12% . But the sheep in D held the line . Meanwhile , the behavior indices of goats in winter varied obviously more than sheep . In spring , the behavior indices of goats in A varied more than the sheep in D ; in the B and C , the behavior indices of the sheep varied more than goats , which indicated that in winter and spring , goats in 1 : 0 flock affected the desert steppe greater than sheep in 0 : 1 flock . In the 1 : 1 and 1 : 3 flocks , goats affected the steppe heavier than sheep in winter , and it was opposite in spring . The variations of grazing behaviors of sheep in D were more than in the others , and that of goats and sheep in B varied least .



**Figure 1** The dynamics of grazing behaviors of grazing goats and sheep in winter and spring .

**Conclusions** Different grazing seasons had a great impact on grazing behaviors . In both winter and spring goats in 1 : 0 flock affected the desert steppe greater than sheep in 0 : 1 flock . The goats in the 1 : 1 and 1 : 3 flocks affected the steppe heavier than sheep in winter , and it was opposite in spring . Comparing spring with winter , goats and sheep in the flock of 1 : 1 gave the least effects on steppe . So the ratio of goats to sheep in 1 : 1 flock was considered reasonable and practicable .

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