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N. A. Janovick
Iowa State University

James R. Russell
Iowa State University, jrussell@iastate.edu

D. Maxwell
Iowa State University

L. James Secor
Iowa State University

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Evaluation of Year-round Forage Management Systems for Spring- and Fall-Calving Beef Cows

Abstract

Stored feeds make up almost half the cost of production for cow-calf enterprises in Iowa. Therefore, any reduction in the amount of stored feeds needed to maintain cows through the winter can have an impact on overall costs of maintaining the herd. Two resources that may be used to reduce the use of stored feeds are corn crop residues and stockpiled perennial forages, which may be grazed during the winter. The objective of this experiment was to design and evaluate grazing systems to utilize such resources.

Keywords

Animal Science

Disciplines

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Evaluation of Year-round Forage Management Systems for Spring- and Fall-Calving Beef Cows

N. A. Janovick, graduate assistant in animal science,

J. R. Russell, professor of animal science, D. Maxwell, beef herdsman, McNay Research and Demonstration Farm, and

L. J. Secor, superintendent, McNay Research and Demonstration Farm

Introduction

Stored feeds make up almost half the cost of production for cow-calf enterprises in Iowa. Therefore, any reduction in the amount of stored feeds needed to maintain cows through the winter can have an impact on overall costs of maintaining the herd. Two resources that may be used to reduce the use of stored feeds are corn crop residues and stockpiled perennial forages, which may be grazed during the winter. The objective of this experiment was to design and evaluate grazing systems to utilize such resources.

Materials and Methods

A year-round grazing system for spring- and fall-calving cows was developed to compare animal production and performance, hay production and feeding, winter forage composition changes, and summer pasture yield and nutrient composition with that from a conventional, or minimal land system. Systems compared forage from smooth brome-grass-orchardgrass-birdsfoot trefoil pastures for both systems in the summer and corn crop residues and stockpiled grass-legume pastures for the year-round system to drylot hay feeding during winter for the minimal land system. The year-round grazing system utilized 1.67 acres of smooth brome-grass-orchardgrass-birdsfoot trefoil (SB-O-T) pasture per cow in the summer, compared with 3.33 acres of SB-O-T pasture per cow in the control (minimal land) system. In addition to SB-O-T pastures, the year-round grazing system utilized 2.5 acres of tall fescue-

red clover (TF-RC) and 2.5 acres of smooth brome-grass-red clover (SB-RC) per cow for grazing in both mid-summer and winter for fall- and spring-calving cows, respectively. First-cutting hay was harvested from the TF-RC and SB-RC pastures, and regrowth was grazed for approximately 45 days in the summer. These pastures were then fertilized with 40 lbs N/acre and stockpiled for winter grazing. Spring-calving cows in the year-round grazing system also grazed corn crop residue (CCR) pastures at an allowance of 2.5 acres per cow in late fall. In the minimal land system, hay was harvested from three-fourths of the area in SB-O-T pastures and stored for feeding in a drylot through the winter. Hay was supplemented when the average condition score of spring-calving cows dropped below 5, the condition score of half of the fall-calving cows dropped to 3 or forage allowance was limited by forage mass or weather conditions. Summer grazing was managed with rotational stocking for both systems, and winter grazing of stockpiled forages and corn crop residues by year-round system cows was managed by strip-stocking.

Results and Discussion

There were no significant differences in hay production between systems for year 1; however, the amounts of hay needed to maintain cows were 923, 1,373, and 4,732 lbs dry matter/cow for year-round fall-calving, year-round spring-calving, and minimal land spring-calving cows, respectively (Table 1). In year 2, hay production per acre in the minimal land system was greater ($P < .05$) than for the year-round system, but the amounts of hay required per cow were 0, 0, and 4,720 lbs dry matter/cow for year-round fall-calving, year-round spring-calving, and minimal land spring-calving cows, respectively.

Average daily gains of fall calves in the year-round system were 1.9 lbs/day compared with weight gains of 2.5 lbs/day for spring calves from both systems (Table 2). Yearly growing animal production from pastures for both years did not differ between systems when weight gains of stockers that grazed summer pastures in the year-round grazing system were added to weight gains of suckling calves.

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Table 1. Year 1 and 2 hay production, feeding and balance for the year-round and minimal land systems.

	System			
	Fall-calving	Year-round Spring-calving	System mean	Minimal land
Year 1				
Hay production,				
lb/harvested ac ^c	1598	2035	1817	1171
lb/cow	3995	5088	4541	2926
Hay fed, lb/cow	923 ^x	1373 ^y	1148 ^a	4732 ^b
Hay balance, lb/cow	3071	3714	3393 ^a	-1805 ^b
Year 2				
Hay production,				
lb/harvested ac ^c	1481	1907	1694 ^a	2883 ^b
lb/cow	3703	4768	4236 ^a	7206 ^b
Hay fed, lb/cow	0	0	0 ^a	4720 ^b
Hay balance, lb/cow	3703	4768	4236	2486

^{ab}Differences between means of systems with different superscripts are significant, P<.05.

^{xy}Differences between means of systems with different superscripts are significant, P<.05.

^cHay was harvested from tall fescue-red clover and smooth brome-grass-red clover fields from 2.5 ac/cow for fall- and spring-calving cows in the year-round grazing system and from smooth brome-grass-orchardgrass-birdsfoot trefoil pastures at 1.67 ac/cow for spring-calving cows in the ML system.

Table 2. Birth weights, weaning weights, average daily gains, and growing animal production for calves and stockers in both the minimal land and year-round grazing systems.

	System		
	Fall Calves	Year-round grazing Spring calves	Minimal land Spring calves
Birth weights, lbs			
Year 1	--	93.9	96.1
Year 2	100.4 ^a	93.5	90.6 ^b
Weaning weights, lbs			
Year 1	415.4	498.7	480.7
Year 2	468.8	544.9	548.9
Average daily gain, lb/day			
Year 1	1.8 ^a	2.6 ^b	2.5 ^b
Year 2	2.0 ^a	2.4 ^b	2.5 ^b
Total growing animal production, lb/ac perennial pasture ^c			
Year 1	Year-round grazing		Minimal land
	107.7		115.5
Year 2	134.5		137.5

^{ab}Differences between means with different superscripts are significant, P<.05.

^cYear-round grazing system, 4.2 acres of perennial pasture per cow and 1.25 acres of cornstalks per cow. Minimal land system, 3.3 acres of perennial pasture per cow. There was no significant difference between systems in total lb/acre production, P>.05.