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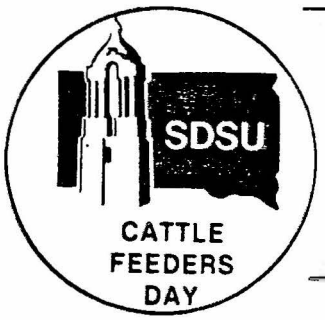

EFFECT OF CLIMATE ON THE ECONOMICS OF CATTLE FEEDING IN SOUTH DAKOTA

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CATTLE 85-2

Summary

A computer model that adjusts feedlot cattle performance for climate conditions was used to compare the efficiency of feedlot beef production in South Dakota (SD) and West Texas (TX). Fall and winter weather depressed average daily gains and increased feed intake and feed efficiency in SD. Spring and summer conditions caused more similar production responses. Added costs due to poor performance were applied to feed requirements. From this information, breakeven ration costs necessary for competitive production costs were determined.

Introduction

Depressed conditions of the cattle feeding industry in the Upper Midwest have prompted interested parties to evaluate in detail, the criteria involved to help identify areas where relief can be obtained. In our region, questions have been raised regarding the disadvantage to cattle feeders caused by our climate. This report summarizes an effort to model the extent that weather conditions impact the efficiency of feedlot cattle in South Dakota and the economic limits imposed.

Experimental Procedures

Performance of cattle was projected using Agnet Beef Grower Software. This performance was modified by including the effects of climate as described in the NRC publication "Effects of Environment on Nutrient Requirements of Domestic Animals". Previous 10 year daily average weather conditions (temperature and precipitation) were used for Brookings, SD and Lubbock, TX for comparison purposes.

Classes of cattle fed, initial weight and date started on feed are shown in table 1. Three diets were used. Energy values and weight of cattle when changes were made are shown in table 2. An interest rate of 13% was charged against the entire purchase price of the steers and a yardage fee of $.25/hd/d was accrued. Feed was assumed to cost $110/T.

In all cases it was presumed we fed medium framed, #1 steers in average condition. The projection was terminated when steers reached 1100 lbs. Feed and cattle were assumed to be of similar quality and feeder purchase price was similar in both locations.

Results and Discussion

Tables 3, 4, 5, 6 and 7 show the projected production results for each of the classes of steers fed at each location. During fall and winter seasons average daily gain (ADG) is lower and feed intake (DMI) and feed efficiency (F/G) were higher in SD. In the spring performance was similar and during summer months their appeared to be a slight advantage for the SD climate.

The differences in performance noted, cause differences in the interest and yardage costs of feeding cattle as well as differences in total feed required. These costs are shown in table as additional cost/hd and as cost/T feed fed to that particular type of steer. These added costs ranged from a $2.49/hd advantage to a $21.60 disadvantage for SD feeders.

Since low cost, usually abundant feed supplies exist in Eastern South Dakota it is appropriate to attempt to absorb the additional production costs by reducing ration costs. The result of this calculation would define the price SD feeders can afford to pay for their rations and still be at an economic breakeven with TX feeders. Based on $110/T TX ration costs SD rations must be priced at or below $101-112/T depending on the time of year and type of steers being fed.

Most sources would indicate that feed costs in South Dakota are low enough to accomplish the needed reduction in ration costs for a breakeven situation. This situation does not guarantee a healthy cattle feeding industry. There are many other factors involved that are beyond the scope of this paper. However, this data does indicate that with proper management of our cattle and feed resources at the level of the cattle feeder we can be competitive with more popular cattle feeding areas of the country.

Table 1. Classes of Steers Fed and Time of Year When Feeding Started

Class	Date entering the feedlot	Initial weight	Price $/cwt
Calves	November 1	450 lb	74.00
Backgrounded	January 1	600 lb	67.00
Spring yearling	April 1	750 lb	63.00
Summer yearling	July 1	800 lb	63.00
Long yearling	October 1	800 lb	63.00

Table 2. Rations Used in Growth Projection Model

Weight range receiving diet	% concentrate	% roughage	NEm (Mcal/lb)	NEg (Mcal/lb)
< 600 lb	60	40	.70	.43
600- 900 lb	75	25	.80	.55
900-1100 lb	90	10	.94	.63

Table 3. Calves Started November 1 (450 lb)

	Date	ADG	Feed intake	F/G
		Grower Phase (600 lb)		
SD	Feb 9	1.50	14.31	9.54
TX	Jan 24	1.78	14.13	7.94
		Intermediate Phase (900 lb)		
SD	May 31	2.70	18.13	6.72
TX	May 11	2.77	18.14	6.55
		Finishing Phase (1100 lb)		
SD	Aug 7	2.96	19.84	6.70
TX	Jul 20	2.85	19.32	6.78
		CLOSE OUT		
SD	290 D	2.33	17.12	7.34
TX	263 D	2.48	17.15	6.91

Table 4. Backgrounded Calves Started January 1 (600 lb)

	Date	ADG	Feed intake	F/G
		Intermediate Phase (900 lb)		
SD	May 6	2.37	17.84	7.53
TX	Apr 26	2.57	17.90	6.96
		Finishing Phase (1100 lb)		
SD	Jul 12	3.01	20.13	6.70
TX	Jul 4	2.87	19.59	6.83
		CLOSE OUT		
SD	194 D	2.59	18.64	7.20
TX	186 D	2.69	18.53	6.88

Table 5. Spring Yearlings Started April 1 (750 lb)

	Date	ADG	Feed intake	F/G
		Intermediate Phase (900 lb)		
SD	Jun 2	2.40	19.40	8.08
TX	Apr 26	2.40	19.10	7.96
		Finishing Phase (1100 lb)		
SD	Aug 9	2.96	19.84	6.70
TX	Aug 13	2.78	18.99	6.83
		CLOSE OUT		
SD	131 D	2.69	19.63	7.29
TX	135 D	2.60	19.04	7.32

Table 6. Summer Yearlings Started July 1 (800 lb)

	Date	ADG	Feed intake	F/G
		Intermediate Phase (900 lb)		
SD	Aug 16	2.16	19.13	8.85
TX	Aug 18	2.05	18.42	8.99
		Finishing Phase (1100 lb)		
SD	Oct 21	3.03	20.28	6.70
TX	Oct 25	2.97	19.89	6.70
		CLOSE OUT		
SD	113 D	2.67	19.80	7.42
TX	117 D	2.58	19.28	7.46

Table 7. Long Yearlings Started October 1 (800 lb)

	Date	ADG	Feed intake	F/G
		Intermediate Phase (900 lb)		
SD	Nov 16	2.13	19.97	9.37
TX	Nov 14	2.23	19.77	8.86
		Finishing Phase (1100 lb)		
SD	Jan 26	2.82	20.60	7.30
TX	Jan 20	3.00	20.59	6.86
		CLOSE OUT		
SD	118 D	2.55	20.35	7.99
TX	112 D	2.69	20.26	7.52

Table 8. Breakdown of Added Feeding Costs By Calf and Ton of Feed[a]

Item	Calf	Back-grounded	Spring yearling	Summer yearling	Long yearling
Costs/head					
Yardage + int.,$	5.79	3.00	-2.16	-1.56	2.79
Feed[b],$	15.81	9.29	.11	-.93	7.26
Costs/ton feed					
Yardage + int.,$	2.33	1.66	-1.68	-1.39	2.32
Feed[b],$	6.36	5.14	.09	-.83	6.04
Breakeven ration price, $/T	101.31	103.20	111.59	112.20	101.64

[a] Added or reduced costs due to performance differences of cattle fed in South Dakota vs Texas.

[b] Based on $110/T ration cost.