Bulletin 1170 September 2008

What Is the Cost of Gain for Stocker Cattle on Ryegrass Pasture?

MAFES

MISSISSIPPI AGRICULTURAL & FORESTRY EXPERIMENT STATION • MELISSA J. MIXON, INTERIM DIRECTOR

MISSISSIPPI STATE UNIVERSITY • VANCE H. WATSON, INTERIM PRESIDENT • MELISSA J. MIXON, INTERIM VICE PRESIDENT

What Is the Cost of Gain for Stocker Cattle on Ryegrass Pasture?

D.G. St. Louis
South Mississippi Branch Experiment Station
Mississippi State University
Poplarville, Mississippi

R.D. Little
Department of Agricultural Economics
Mississippi State University
Starkville, Mississippi

Bulletin 1170 was published by the Office of Agricultural Communications, a unit of the Division of Agriculture, Forestry, and Veterinary Medicine at Mississippi State University.

What Is the Cost of Gain for Stocker Cattle on Ryegrass Pasture?

INTRODUCTION

Many growing cattle graze ryegrass pastures in south Mississippi before they are shipped for fattening in western feedlots. The profitability of grazing ryegrass is greatly affected by stocking rate and supplemental feed costs. As stocking rates increase, per-animal pasture costs decrease. However, at higher stocking rates, feed costs may also increase. Optimum stocking rates and profitability depend upon many variables. The most important variable for growing ryegrass is weather, which affects rainfall, temperature, and planting time. Most producers remove animals from pasture when grazing is inadequate due to adverse weather effects. Therefore, they try to set their initial stocking rate to minimize the amount of time that cattle are off pasture to minimize the amount of supplemental feed necessary. This procedure increases per-animal pasture costs and can prevent the forage from being used to its full potential. However, past experience has taught producers that animal performance is much better on ryegrass pasture than off.

Bermudagrass or bahiagrass hay is usually fed when cattle are removed from ryegrass pasture because hay costs less than other feeds. However, feeding hay is often not cost-effective because animal daily gains are insufficient to cover feed costs. Hay typically contains inadequate protein and/or energy to meet animal nutrient requirements. Supplementation with feed grains and feed by-products is often necessary to enhance animal performance and farm profits (Kunkle, 2001; McCann and Stewart, 2000; Rankin, 2007). The objective should be to maximize returns to animal weight gain (final weight minus initial weight), as this is the end product being sold.

Farmers in south Mississippi often enter into contract agreements through which they are paid for the weight gain of growing cattle that are owned by someone else. By grazing cattle on contract, farmers (1) are not exposed to the risks of price volatility, (2) do not need as much capital, and (3) typically share death loss, thus it is usually spread between the farmer and cattle owner. However, the farmer assumes all of the risks of weather, cattle sickness, management decisions, and plant diseases and pests. The overall goal of this study was to determine if selected grain supplementation strategies could improve profitability of grazing cattle, whether the farmer owned the cattle or not.

This study had three objectives:

- To evaluate animal weight gains and profitability of total mixed rations (TMRs) for growing beef cattle in south Mississippi;
- To determine if TMRs are feasible for supplementing ryegrass pasture; and
- To use least-cost ration formulation, with current nutrition research results, to reduce the cost of gain for growing beef cattle.

Materials and Methods

We randomly assigned 194 steers to one of three treatments in a randomized complete block design with 3 years as blocks and animals as subsamples. There were three treatments:

(1) Drylot feeding with no ryegrass pasture (DRYLOT);

(2) Control treatment of ryegrass pasture stocked at 600 pounds per acre (RG1); and

(3) Ryegrass pasture stocked at 900 pounds per acre (RG2).

DRYLOT had 49 animals, RG1 had 83, and RG2 had 62 (Table 1). Numbers per treatment varied due to the size of pastures and the desired stocking rates. The beginning weight was 514 pounds in year 1 (2003-2004), 384 pounds in year 2 (2004-2005), and 402 pounds in year 3 (2005-2006). Animals were blocked by weight and assigned so that each treatment group had equal average initial weights per group. Animals were typical, No. 1 grade, contract-grazing steers. South Mississippi Branch Experiment Station bought the steers in year 1. In years 2 and 3, the station received steers on contract from the cattle owners (Caprock Cattle Feeders and P & R Cattle) and was paid based on animal gains. Animal weight gains, determined from purchase and sale weights, were analyzed using SAS GLM procedures.

In year 1, cattle were preconditioned together on ryegrass pasture upon arrival and then assigned to treatments after 13 days. In subsequent years, cattle were preconditioned before arrival. Preconditioning included deworming with Cydectin and immunization against respiratory and clostridial diseases.

The diet for animals in the DRYLOT treatment was formulated in a TMR to minimize the feed cost of gain using two models, the Cornell Net Carbohydrate and Protein System (CNCPS, Version 5.0, Level 2, 2003) and BRILL Feed Ration Balancer (Feed Management Systems, Inc.). The BRILL model was used to formulate least-cost diets, and the results were evaluated with the CNCPS model. The BRILL model is a linear program to determine which feedstuffs that, when combined, will minimize costs and still meet the maximum or minimum nutrient limitations imposed. Inputs are feed costs and feed nutrient analyses. Major restrictions for the BRILL program were neutral detergent fiber (NDF), net energy for gain (NEg), and digestible intake protein (DIP). There were several restrictions to the CNCPS model: rumen pH above 6.4, fat below 6%, and positive metabolizable protein (MP) and rumen nitrogen balance. Resulting diets that minimized the cost of gain were also those that maximized average daily gains (ADG) given these restrictions.

Major feed ingredients used in diet formulation (corn, soybean hulls, corn gluten feed, whole cottonseed, etc.) were delivered in bulk and priced on the day of delivery. Locally produced bermudagrass hay was shredded and priced at $60 per ton in the formulation program, if it was used in the diets. When feedstuff inventory began to be depleted, a new least-cost diet was reformulated using current feed prices. Therefore, feeds and their amounts in the diet were adjusted as necessary to minimize the feed cost of gain. The price per ton of reformulated TMR was recalculated using the cost of the new ingredient purchased and the purchase price of ingredients still on inventory at the time. The resulting TMR was fed using a mixer feeder wagon mounted with scales.

For animals in treatments RG1 and RG2, Marshall ryegrass was planted in mid-September by drilling seed (25 pounds per acre) into a seedbed prepared by disking. Fertilizer was applied and incorporated in the last disking to provide 33 pounds per acre of N plus P_2O_5 and K_2O to meet soil recommendations. Additional N at 68 pounds per acre was applied in November and January to provide one unit of N for each day from planting to April 1. In year 1 (2003-2004), N application on treatment RG1 pasture was reduced to 51 pounds per acre in the January because pasture had adequate growth to meet the animal requirements. In year 3 (2005-2006), the first application of additional N was not until mid-December, and the second application was skipped due to drought and late stand establishment.

Grazing of pastures began when ryegrass was about 10 inches high. One week before quantity of ryegrass pasture was judged to limit intake of grazing animals (2 inches), the TMR used in the DRYLOT treatment was fed ad libitum without removing cattle from pasture. When grazing was judged to be adequate (5 inches) feeding of the TMR was discontinued. The grazing period varied each year, depending on weather.

Feed samples were analyzed for crude protein (CP) and acid detergent fiber (ADF) by NIR analysis for ini-

tial diet formulations. Values for other feed fractions were taken from the NRC (1996) appendix Tables 6-8.

Economic analyses were conducted each year for each treatment for all variable and fixed costs to determine the return to specified expenses and the cost of gain for each treatment. Income and expenses were divided between the farmer and the owner of the cattle. Land rent of $25 per acre was charged to the farmer because land values in the Southeast are greatly affected by urbanization. Interest on capital investment, as well as taxes and insurance, for land would not accurately reflect true land costs to a cattle enterprise. Fixed costs of fencing, buildings, feed and water troughs, machinery and equipment assumed a 300-head capacity. Feed storage and mixing facilities, a skid-steer loader, and a mixer-feeder wagon were budgeted for the DRYLOT treatment but not for the RG1 and RG2 treatments by assuming feed to be mixed when delivered. A 90-horsepower tractor and associated tillage equipment were budgeted for the pasture treatments but not for the DRYLOT treatment. Other assumptions for budget calculations are shown in Table 6.

Results and Discussion

The TMRs used in this study proved their feasibility by the resulting excellent animal weight gains, both on and off ryegrass pasture, at satisfactory costs. There were no digestive problems in transition from ryegrass pasture to the TMR or the reverse. Treatments were not statistically different (P=0.43) for ADG, indicating that these TMRs are comparable to ryegrass pasture for growing beef cattle in south Mississippi. The ADG was 3.15 pounds for year 1, 2.92 pounds for year 2, and 2.93 pounds for year 3 (mean of treatments in Table 1). These gains are respectable considering that purchase and sale weights were used in calculations. In year 1, cattle were of better quality (more No.1 steers with more Angus genetics) than in subsequent years due to source. If cattle had been of equal quality each year, the lighter cattle of years 2 and 3 (100 and 82 pounds lighter, respectively) would have performed better (NRC, 1996).

Table 1. Steer performance summary for drylot and ryegrass pasture treatments.[1]

Item	Units	DRYLOT	RG1	RG2	SE	*P* Values[2]
				2003-2004		
Steers	head	18	24	18		
Grain feeding	days	145	0	49		
Purchase weight	lb	499	496	493	7.51	0.95
Sale weight	lb	962	955	941	10.65	0.73
Gain	lb	463	459	448	7.16	0.69
ADG	lb	3.20	3.16	3.09	0.05	0.68
				2004-2005[3]		
Steers	head	11	31	23		
Grain feeding	days	142	67	89		
Purchase weight	lb	394	395	394	4.04	1.00
Sale weight	lb	816	802	812	8.64	0.66
Gain	lb	422	408	418	7.88	0.60
ADG	lb	2.97	2.87	2.95	0.06	0.60
				2005-2006[4]		
Steers	head	20	28	21		
Grain feeding	days	97	23	23		
Purchase weight	lb	414	412	420	4.65	0.63
Sale weight	lb	699	702	696	8.90	0.97
Gain	lb	285	290	276	8.02	0.73
ADG	lb	2.94	2.99	2.84	0.08	0.73

[1]DRYLOT received only a total mixed ration (TMR), RG1 stocked at 600 pounds per acre on ryegrass pasture, RG2 stocked at 900 pounds per acre on ryegrass pasture. TMR fed to RG1 and RG2 as needed.
[2]Probability of effects due to treatment.
[3]Severe blast disease was experienced in the 2004-2005 season.
[4]Severe drought was experienced in the 2005-2006 season.

Table 2. Total mixed ration (TMR) and ryegrass pasture analyses.[1]

Item[2]	Units	TMR			Ryegrass
		2003-2004	2004-2005	2005-2006	2005-2006
CP	%	14.00	22.10	20.40	25.40
NDF	%	48.50	37.10	43.10	41.70
Fat	%	3.00	5.80	4.50	3.70
ME	Mcal/kg	2.55	2.64	2.66	2.55
NEm	Mcal/kg	1.65	1.73	1.74	1.65
NEg	Mcal/kg	1.04	1.11	1.12	1.04
Ca	%	0.50	0.56	0.95	0.75
P	%	0.37	0.82	0.72	0.39
Mg	%	0.26	0.44	0.34	0.34
K	%	1.12	1.41	1.34	2.70

[1]Dry matter basis. Ration used midway (75 days) through feeding period.
[2]CP = crude protein, NDF = neutral detergent fiber, ME = metabolizable energy, NEm = net energy for maintenance, NEg = net energy for gain, Ca = calcium, P = phosphorus, K = potassium.

Table 3. Feed costs for drylot and ryegrass pasture treatments.[1]

Item	Units	Unit cost	DRYLOT	RG1	RG2
			$/head	*$/head*	*$/head*
			2003-2004[4]		
Ryegrass pasture[2]	acre	$124.02	$11.13	$94.87	$66.80
Bovatec 68	lb	$5.91	$3.46		$0.95
Mineral Mix[3]	ton	$422.01	$6.38	$3.45	$5.88
Corn	ton	$111.57	$45.82		$15.74
Whole cottonseed	ton				
Soybean hulls	ton	$109.62	$78.53		$28.04
Gluten feed	ton	$124.75	$44.61		$16.91
Hay	ton	$60.00	$6.15		$2.08
Total			$196.08	$98.32	$136.41
			2004-2005[5]		
Ryegrass pasture[2]	acre	$148.25		$97.79	$65.19
Bovatec 68	lb	$5.91	$1.14	$0.36	$0.42
Mineral Mix[3]	ton	$574.00	$9.78	$7.31	$6.77
Corn	ton	$101.60	$7.60	$1.51	$3.35
Whole cottonseed	ton	$83.32	$9.24	$4.92	$2.65
Soybean hulls	ton	$107.00	$14.09	$2.15	$6.50
Gluten feed	ton	$117.00	$80.15	$33.35	$28.16
Hay	ton	$60.00	$5.12	$2.22	$2.19
Total			$127.12	$149.60	$115.23
			2005-2006[6]		
Ryegrass pasture[2]	acre	$101.77		$68.15	$45.43
Bovatec 68	lb	$5.91	$1.54	$0.13	$0.13
Mineral Mix[3]	ton	$294.00	$5.84	$4.50	$4.50
Corn	ton				
Whole cottonseed	ton	$124.00	$25.71	$3.07	$3.07
Soybean hulls	ton	$130.75	$12.84	$1.23	$1.23
Gluten feed	ton	$122.25	$51.27	$10.03	$10.03
Hay	ton	$60.00	$1.44	$0.70	$0.70
Total			$98.64	$87.82	$65.10

[1]DRYLOT received only a total mixed ration (TMR), RG1 stocked at 600 pounds per acre on ryegrass pasture, RG2 stocked at 900 pounds per acre on ryegrass pasture. TMR fed to RG1 and RG2 as needed.
[2]Fixed machinery costs included in pasture costs.
[3]Free choice mineral included in pasture treatments.
[4]Preconditioning for 13 days on ryegrass pasture in the 2003-2004 season. No preconditioning in subsequent years.
[5]Severe blast disease was experienced in the 2004-2005 season.
[6]Severe drought was experienced in the 2005-2006 season.

Linear programming for least-cost rations proved an effective tool for reformulating TMR diets by reducing feed costs when ingredient prices changed. At the same time, animal ADG was maintained, thus lowering the cost of gain. The TMR used exclusively in the DRYLOT treatment and as a supplement in treatments RG1 and RG2 had a range of crude protein (CP) from 14% to 22.1% (Table 2). However, when using the byproduct feeds and prices at the time of formulation, the CP content of ingredients was not important in formulating least-cost diets compared with other feed quality indicators. Protein digestibility as measured by DIP was important. Of most importance to least-cost diet formulation — as well as to and least cost of animal gain — was adequate neutral detergent fiber (NDF) to maintain rumen pH and maximum energy for maximum gain. Fat content was limited to 6% when feeding whole cottonseed. The TMR was not needed in year 1 (2003-2004) to supplement the animals in treatment RG1 because pasture growth was adequate throughout the season. The energy in the TMR was similar to that of ryegrass pasture (Table 2), which likely explains the lack of animal performance differences between treatments.

As feed prices changed, corn was fed in years 1 and 2 but not in year 3. Whole cottonseed was fed in years 2 and 3 and not in year 1. Soybean hull prices ranged from $107 to $130.75 per ton, and corn gluten feed ranged from $117 to $124.75 per ton emphasizing the importance of new least-cost TMR calculations each time feeds were purchased (Table 3).

Cost of the TMR ranged from $110.62 to $118.31 per ton in year 1, from $111.65 to $117.48 per ton in year 2, and from $119.65 to $126.20 per ton in year 3 (not shown in tables). Since animal gains were not affected, the cost of gain was minimized with the use of least-cost ration reformulation as ingredient prices changed. A constant average of $117.40 per ton was used for budget calculations. Pasture costs increased each year primarily due to increasing fertilizer prices. If the same amount of fertilizer had been applied each year as was intended (no drought, etc.), pasture costs would have been $117.28 per acre for year 1, $128.13 for year 2, and $129.27 for year 3. At planting time in the 2008-2009 season (not part of this study), pasture cost was more than $350. As fertilizer prices continue to increase, byproduct feeds and higher stocking rates become more attractive.

Table 4. Steer economic summary for drylot and ryegrass pasture treatments.[1]

Item	Units	DRYLOT	RG1	RG2
			2003-2004[2]	
Direct cost of gain	$/cwt	$53.96	$34.74	$42.33
Total cost of gain	$/cwt	**$57.69**	**$44.83**	**$45.46**
Farmer payment for gain	$/cwt	$35.00	$35.00	$35.00
Farmer payment for medications	$/head	$15.00	$15.00	$15.00
Return to farmer	$/head	-$86.45	$4.93	-$28.95
Return to owner	$/head	$4.58	$4.58	$4.58
			2004-2005[3]	
Direct cost of gain	$/cwt	$37.93	$46.58	$36.82
Total cost of gain	$/cwt	**$41.93**	**$50.31**	**$40.20**
Farmer payment for gain	$/cwt	$38.00	$38.00	$38.00
Farmer payment for medications	$/head	$0.00	$0.00	$0.00
Return to farmer	$/head	-$15.59	-$44.93	-$5.27
Return to owner	$/head	$13.05	$13.05	$13.05
			2005-2006[4]	
Direct cost of gain	$/cwt	$47.30	$45.81	$36.23
Total cost of gain	$/cwt	**$53.14**	**$51.30**	**$41.18**
Farmer payment for gain	$/cwt	$40.00	$40.00	$40.00
Farmer payment for medications	$/head	$0.00	$0.00	$0.00
Return to farmer	$/head	-$37.35	-$32.10	-$3.36
Return to owner	$/head	-$6.34	-$6.34	-$6.34

[1]From Tables 7A through 15C. DRYLOT received only a total mixed ration (TMR), RG1 stocked at 600 pounds per acre on ryegrass pasture, RG2 stocked at 900 pounds per acre on ryegrass pasture. TMR fed to RG1 and RG2 as needed.
[2]Death loss, 1 of 60 in the 2003-2004 season charged to owner.
[3]Death loss, 1 of 65 in the 2004-2005 season charged to owner.
[4]Death loss, 1 of 70 in the 2005-2006 season charged to owner.

Table 5. Break-even cost of gain for drylot and ryegrass pasture treatments.[1]

Item	Units	DRYLOT	RG1	RG2
			2003-2004[2]	
Total farmer expenses	$/hd	271.40	180.02	213.90
Owner + farmer expenses	$/hd	304.50	212.67	246.55
Gain	cwt/head	4.57	4.57	4.57
Breakeven to farmer	$/cwt	**59.39**	**39.39**	**46.81**
Breakeven to owner/farmer	$/cwt	**66.63**	**46.54**	**53.95**
			2004-2005[3]	
Total farmer expenses	$/hd	182.91	212.25	172.60
Owner + farmer expenses	$/hd	211.55	240.89	201.23
Gain	cwt/head	4.14	4.14	4.14
Breakeven to farmer	$/cwt	**44.18**	**51.27**	**41.69**
Breakeven to owner/farmer	$/cwt	**51.10**	**58.19**	**48.61**
			2005-2006[4]	
Total farmer expenses	$/hd	151.04	145.79	117.04
Owner + farmer expenses	$/hd	179.74	174.49	145.75
Gain	cwt/head	2.84	2.84	2.84
Breakeven to farmer	$/cwt	**53.18**	**51.33**	**41.21**
Breakeven to owner/farmer	$/cwt	**63.29**	**61.44**	**51.32**

[1]From Tables 7A through 15C. DRYLOT received only a total mixed ration (TMR), RG1 stocked at 600 pounds per acre on ryegrass pasture, RG2 stocked at 900 pounds per acre on ryegrass pasture. TMR fed to RG1 and RG2 as needed.
[2]Death loss, 1 of 60 in the 2003-2004 season.
[3]Death loss, 1 of 65 in the 2004-2005 season.
[4]Death loss, 1 of 70 in the 2005-2006 season.

The TMR used in this study was not as profitable as ryegrass pasture for growing beef cattle in south Mississippi. However, treatment differences in total cost of gain (COG) were minimal. With variable and fixed costs included, COG was $50.92 per hundredweight for DRYLOT, $48.81 for RG1, and $42.28 for RG2 (P=0.25, not shown in tables). From Table 4, it is apparent, under the conditions of this study, that farmers are not paid enough on weight gain contracts to recover their costs. It is also apparent that owners are exposed to considerable price risk. Table 5 shows what farmers should have received in contract payments to break even under the conditions of this study. Farmers often own the cattle themselves. The total break-even COG in Table 5 will help farmers decide how much price risk they are willing to accept as they strive to cover all costs (land, labor, management, and operating costs). Because there were no treatment differences in ADG, the total income for all treatments within each year was the same (Tables 7A, 8A, …15A). Therefore, the least expensive alternative was also the one that resulted in the least COG. If treatment ADGs had been different, this would not necessarily have been the case. In 2003-2004, RG1 would have been the best alternative, while RG2 was best for the following years.

A farmer may not want to include costs for land, labor, and/or management when calculating break-even COG. Individual treatment/year break-even analyses in Tables 7C, 8C, … 15C remove land, labor, and management costs so farmers can decide whether to raise stockers on contract or own the cattle themselves.

Table 6. Assumptions used in enterprise budgeting.

Item	Unit	Amount	Prorated
Labor	hour	$10.00	NA
Management	head	$10.00	NA
Land rent	acre	$25.00	not prorated
Interest on animal purchase	annual	8.6%	5 months
Interest on operating capital	annual	6.0%	7 months
Interest on capital investment[1,2]	annual	4.0%	7 months
Taxes and insurance[1,2]	annual	1.0%	7 months
Depreciation of fencing, buildings, and equipment[2]	annual	calculated	7 months

[1]Interest on capital investment, taxes and insurance was calculated for fencing, buildings, and equipment. Land is not included.
[2]Assumes a 300-head capacity.

Table 7A. DRYLOT treatment, 2003-2004 season, received TMR after 13 days preconditioning on ryegrass pasture — income, expenses, and returns for owner of stocker steers and farmer.

Item	Unit	$/unit	No. units	TOTAL	OWNER	FARMER
				$/head	*$/head*	*$/head*
INCOME						
Feeder calf sale (w/shrink)	Cwt	84.00	9.53	800.52	800.52	
Gain payment	Cwt	35.00	4.57			159.95
Per head payment	Head	15.00	1.00			15.00
Excess death loss payment over 2%					0.00	
Total income	$/head			800.52	800.52	174.95
DIRECT EXPENSES						
Contract grazing	Cwt	38.28	4.57		174.95	
Feeder calf purchase	Cwt	109.21	4.96	541.68	541.68	
Pasture (Table 16)	Acre	117.25	0.09	10.77		10.77
Preconditioning feed	Cwt	6.16	0.00	0.00		0.00
Grower feed	Cwt	5.87	31.51	184.95		184.95
Hay	Ton	50.00	0.00	0.00		0.00
Salt and minerals	Cwt	23.00	0.00	0.00		0.00
Implants	Head	0.92	1.00	0.92		0.92
Dewormers	Head	2.99	1.00	2.99		2.99
Antibiotics	Head	10.68	1.00	10.68		10.68
Vaccines	Head	4.83	1.00	4.83		4.83
Fly control	Head	0.00	1.00	0.00		0.00
Fences, feeders, building repair	Year	7.19	0.58	4.20		4.20
Feeding fuel & repair	Hours	2.16	0.05	0.11		0.11
Rent	Acre	25.00	0.09	2.30		2.30
Labor (pasture & cattle)	Hours	10.00	1.62	16.17		16.17
Death loss	Dol.	541.68	1.67%	9.03	8.95	0.08
Marketing	Dol.	800.52	2.00%	16.01	16.01	
Interest on calf	Dol.	541.68	3.58%	19.41	19.41	
Interest on operating capital	Dol.	237.91	3.50%	8.33		8.33
Management charge	Head	10.00	1.00	10.00		10.00
TOTAL DIRECT EXPENSES				842.37	761.00	256.32
Direct cost of gain	$/cwt			65.80	47.99	56.09
FIXED EXPENSES						
(Assumes 300-head capacity for 7 months)						
Interest on investment	Year	290.82	2.33%	6.79		6.79
Insurance & taxes	Year	290.82	1.00%	2.91		2.91
Depreciation (prorated for 7 months)						
Fencing	Acre	3.52	0.05	0.19		0.19
Pasture planting equipment	Acre	6.77	0.05	0.36		0.36
Feeding equipment	Hours	2.50	0.05	0.13		0.13
Buildings & improvements	Year	11.63	0.58	6.79		6.79
TOTAL FIXED EXPENSES				17.16	0.00	17.16
TOTAL SPECIFIED EXPENSES				859.53	761.00	273.47
Total cost of gain	$/cwt			**69.55**	47.99	**59.84**
RETURN TO SPECIFIED EXPENSES				-59.01	**39.52**	**-98.52**

Table 7B. DRYLOT treatment, 2003-2004 season, received TMR after 13 days preconditioning on ryegrass pasture — economic summary for owner of stocker steers and farmer.[1]

Item	TOTAL	OWNER	FARMER
	$/head	*$/head*	*$/head*
TOTAL INCOME	800.52	800.52	174.95
TOTAL DIRECT EXPENSES	842.37	761.00	256.32
TOTAL FIXED EXPENSES	17.16	0.00	17.16
TOTAL SPECIFIED EXPENSES	859.53	761.00	273.47
TOTAL SPECIFIED EXPENSES MINUS ANIMAL PURCHASE	317.85	219.32	273.47

[1]From previous table.

Table 7C. DRYLOT treatment, 2003-2004 season, received TMR after 13 days preconditioning on ryegrass pasture — economic summary for owner of stocker steers and farmer.[1]

Item	TOTAL	OWNER	FARMER	BREAK-EVEN COST OF GAIN[2]	
				TOTAL	FARMER
	$/head	*$/head*	*$/head*	*$/cwt*	*$/cwt*
RETURN TO SPECIFIED EXPENSES[3]	-59.01	39.52	-98.52	69.55	59.84
RETURN TO LAND	-56.71		-56.71	69.05	59.34
RETURN TO LABOR	-42.84		-42.84	66.01	56.30
RETURN TO MANAGEMENT	-49.01		-49.01	67.36	57.65
RETURN TO CAPITAL	-24.49	58.93	-83.41	62.00	56.53
RETURN TO LABOR & MANAGEMENT	-91.85		-91.85	63.83	54.12
RETURN TO LAND, LABOR & MANAGEMENT	-148.56		-148.56	63.32	53.61
RETURN TO LAND & CAPITAL	-81.20	58.93	-140.12	61.49	56.03
RETURN TO LAND, CAPITAL & MANAGEMENT	-130.21	58.93	-189.13	59.31	53.84

[1]From previous two tables.
[2]Break-even cost of gain when specified land, labor, management, and capital NOT included in expenses.
[3]Expenses include land, labor, management, and capital.

Table 8A. RG1 treatment, 2003-2004 season, ryegrass pasture stocked at 600 pounds per acre — income, expenses, and returns for owner of stocker steers and farmer.

Item	Unit	$/unit	No. units	TOTAL	OWNER	FARMER
				$/head	*$/head*	*$/head*
INCOME						
Feeder calf sale (w/shrink)	Cwt	84.00	9.53	800.52	800.52	
Gain payment	Cwt	35.00	4.57			159.95
Per head payment	Head	15.00	1.00			15.00
Excess death loss payment over 2%					0.00	
Total income	$/head			800.52	800.52	174.95
DIRECT EXPENSES						
Contract grazing	Cwt	38.28	4.57		174.95	
Feeder calf purchase	Cwt	109.21	4.96	541.68	541.68	
Pasture (Table 16)	Acre	110.82	0.83	91.61		91.61
Preconditioning feed	Cwt	6.16	0.00	0.00		0.00
Grower feed	Cwt	5.87	0.00	0.00		0.00
Hay	Ton	50.00	0.00	0.00		0.00
Salt and minerals	Cwt	23.00	0.15	3.45		3.45
Implants	Head	0.92	1.00	0.92		0.92
Dewormers	Head	2.99	1.00	2.99		2.99
Antibiotics	Head	10.68	1.00	10.68		10.68
Vaccines	Head	4.83	1.00	4.83		4.83
Fly control	Head	0.00	1.00	0.00		0.00
Fences, feeders, building repair	Year	8.64	0.58	5.04		5.04
Feeding fuel & repair	Hours	1.06	0.00	0.00		0.00
Rent	Acre	25.00	0.83	20.67		20.67
Labor (pasture & cattle)	Hours	10.00	2.00	20.00		20.00
Death loss	Dol.	541.68	1.67%	9.03	8.95	0.08
Marketing	Dol.	800.52	2.00%	16.01	16.01	
Interest on calf	Dol.	541.68	3.58%	19.41	19.41	
Interest on operating capital	Dol.	160.20	3.50%	5.61		5.61
Management charge	Head	10.00	1.00	10.00		10.00
TOTAL DIRECT EXPENSES				761.93	761.00	175.88
Direct cost of gain	$/cwt			48.19	47.99	38.49
FIXED EXPENSES						
(Assumes 300-head capacity for 7 months)						
Interest on investment	Year	240.69	2.33%	5.62		5.62
Insurance & taxes	Year	240.69	1.00%	2.41		2.41
Depreciation (prorated for 7 months)						
Fencing	Acre	1.98	0.48	0.96		0.96
Pasture planting equipment	Acre	6.77	0.48	3.26		3.26
Feeding equipment	Hours	0.82	0.00	0.00		0.00
Buildings & improvements	Year	6.63	0.58	3.87		3.87
TOTAL FIXED EXPENSES				16.11	0.00	16.11
TOTAL SPECIFIED EXPENSES				778.05	761.00	191.99
Total cost of gain	$/cwt			51.72	47.99	42.01
RETURN TO SPECIFIED EXPENSES				22.47	39.52	-17.04

Table 8B. RG1 treatment, 2003-2004 season, ryegrass pasture stocked at 600 pounds per acre — economic summary for owner of stocker steers and farmer.[1]

Item	TOTAL	OWNER	FARMER
	$/head	*$/head*	*$/head*
TOTAL INCOME	800.52	800.52	174.95
TOTAL DIRECT EXPENSES	761.93	761.00	175.88
TOTAL FIXED EXPENSES	16.11	0.00	16.11
TOTAL SPECIFIED EXPENSES	778.05	761.00	191.99
TOTAL SPECIFIED EXPENSES MINUS ANIMAL PURCHASE	236.36	219.32	191.99

[1]From previous table.

Table 8C. RG1 treatment, 2003-2004 season, ryegrass pasture stocked at 600 pounds per acre — economic summary for owner of stocker steers and farmer.[1]

Item	TOTAL	OWNER	FARMER	BREAK-EVEN COST OF GAIN[2]	
				TOTAL	FARMER
	$/head	*$/head*	*$/head*	*$/cwt*	*$/cwt*
RETURN TO SPECIFIED EXPENSES[3]	22.47	39.52	-17.04	51.72	42.01
RETURN TO LAND	43.14		43.14	47.20	37.49
RETURN TO LABOR	42.48		42.48	47.34	37.63
RETURN TO MANAGEMENT	32.47		32.47	49.53	39.82
RETURN TO CAPITAL	53.11	58.93	-5.82	45.02	39.56
RETURN TO LABOR & MANAGEMENT	74.95		74.95	45.16	35.45
RETURN TO LAND, LABOR & MANAGEMENT	118.09		118.09	40.63	30.92
RETURN TO LAND & CAPITAL	96.25	58.93	37.32	40.50	35.03
RETURN TO LAND, CAPITAL & MANAGEMENT	128.72	58.93	69.80	38.31	32.85

[1]From previous two tables.
[2]Break-even cost of gain when specified land, labor, management and capital NOT included in expenses.
[3]Expenses include land, labor, management and capital.

Table 9A. RG2 treatment, 2003-2004 season, ryegrass pasture stocked at 900 pounds per acre — income, expenses, and returns for owner of stocker steers and farmer.

Item	Unit	$/unit	No. units	TOTAL	OWNER	FARMER
				$/head	*$/head*	*$/head*
INCOME						
Feeder calf sale (w/shrink)	Cwt	84.00	9.53	800.52	800.52	
Gain payment	Cwt	35.00	4.57			159.95
Per head payment	Head	15.00	1.00			15.00
Excess death loss payment over 2%					0.00	
Total income	$/head			800.52	800.52	174.95
DIRECT EXPENSES						
Contract grazing	Cwt	38.28	4.57		174.95	
Feeder calf purchase	Cwt	109.21	4.96	541.68	541.68	
Pasture (Table 16)	Acre	117.25	0.55	64.62		64.62
Preconditioning feed	Cwt	6.16	0.00	0.00		0.00
Grower feed	Cwt	5.87	11.86	69.61		69.61
Hay	Ton	50.00	0.00	0.00		0.00
Salt and minerals	Cwt	23.00	0.15	3.45		3.45
Implants	Head	0.92	1.00	0.92		0.92
Dewormers	Head	2.99	1.00	2.99		2.99
Antibiotics	Head	10.68	1.00	10.68		10.68
Vaccines	Head	4.83	1.00	4.83		4.83
Fly control	Head	0.00	1.00	0.00		0.00
Fences, feeders, building repair	Year	8.37	0.58	4.88		4.88
Feeding fuel & repair	Hours	1.06	0.02	0.02		0.02
Rent	Acre	25.00	0.55	13.78		13.78
Labor (pasture & cattle)	Hours	10.00	1.86	18.57		18.57
Death loss	Dol.	541.68	1.67%	9.03	8.95	0.08
Marketing	Dol.	800.52	2.00%	16.01	16.01	
Interest on calf	Dol.	541.68	3.58%	19.41	19.41	
Interest on operating capital	Dol.	194.35	3.50%	6.80		6.80
Management charge	Head	10.00	1.00	10.00		10.00
TOTAL DIRECT EXPENSES				797.28	761.00	211.22
Direct cost of gain	$/cwt			55.93	47.99	46.22
FIXED EXPENSES						
(Assumes 300-head capacity for 7 months)						
Interest on investment	Year	230.02	2.33%	5.37		5.37
Insurance & taxes	Year	230.02	1.00%	2.30		2.30
Depreciation (prorated for 7 months)						
Fencing	Acre	2.49	0.32	0.80		0.80
Pasture planting equipment	Acre	6.77	0.32	2.18		2.18
Feeding equipment	Hours	0.82	0.02	0.02		0.02
Buildings and improvements	Year	6.63	0.58	3.87		3.87
TOTAL FIXED EXPENSES				14.53	0.00	14.53
TOTAL SPECIFIED EXPENSES				811.81	761.00	225.75
Total cost of gain	$/cwt			59.11	47.99	49.40
RETURN TO SPECIFIED EXPENSES				-11.29	39.52	-50.80

Table 9B. RG2 treatment, 2003-2004 season, ryegrass pasture stocked at 900 pounds per acre — economic summary for owner of stocker steers and farmer.[1]

Item	TOTAL	OWNER	FARMER
	$/head	*$/head*	*$/head*
TOTAL INCOME	800.52	800.52	174.95
TOTAL DIRECT EXPENSES	797.28	761.00	211.22
TOTAL FIXED EXPENSES	14.53	0.00	14.53
TOTAL SPECIFIED EXPENSES	811.81	761.00	225.75
TOTAL SPECIFIED EXPENSES MINUS ANIMAL PURCHASE	270.13	219.32	225.75

[1]From previous table.

Table 9C. RG2 treatment, 2003-2004 season, ryegrass pasture stocked at 900 pounds per acre — economic summary for owner of stocker steers and farmer.[1]

Item	TOTAL	OWNER	FARMER	BREAK-EVEN COST OF GAIN[2]	
				TOTAL	FARMER
	$/head	*$/head*	*$/head*	*$/cwt*	*$/cwt*
RETURN TO SPECIFIED EXPENSES[3]	-11.29	39.52	-50.80	59.11	49.40
RETURN TO LAND	2.49		2.49	56.09	46.38
RETURN TO LABOR	7.28		7.28	55.05	45.34
RETURN TO MANAGEMENT	-1.29		-1.29	56.92	47.21
RETURN TO CAPITAL	20.29	58.93	-38.63	52.20	46.74
RETURN TO LABOR & MANAGEMENT	5.99		5.99	52.86	43.15
RETURN TO LAND, LABOR & MANAGEMENT	8.48		8.48	49.84	40.13
RETURN TO LAND & CAPITAL	22.78	58.93	-36.15	49.18	43.72
RETURN TO LAND, CAPITAL & MANAGEMENT	21.49	58.93	-37.43	47.00	41.53

[1]From previous two tables.
[2]Break-even cost of gain when specified land, labor, management, and capital NOT included in expenses.
[3]Expenses include land, labor, management, and capital.

Table 10A. DRYLOT treatment, 2004-2005 season, received only TMR — income, expenses, and returns for owner of stocker steers and farmer.

Item	Unit	$/unit	No. units	TOTAL	OWNER	FARMER
				$/head	*$/head*	*$/head*
INCOME						
Feeder calf sale (w/shrink)	Cwt	104.25	8.08	842.34	842.34	
Gain payment	Cwt	38.00	4.14			157.32
Per head payment	Head	0.00	1.00			0.00
Excess death loss payment over 2%					0.00	
Total income	$/head			842.34	842.34	157.32
DIRECT EXPENSES						
Contract grazing	Cwt	38.00	4.14		157.32	
Feeder calf purchase	Cwt	126.00	3.94	496.44	496.44	
Pasture (Table 17)	Acre	144.32	0.07	10.53		10.53
Preconditioning feed	Cwt	6.16	0.00	0.00		0.00
Grower feed	Cwt	5.87	21.66	127.12		127.12
Hay	Ton	50.00	0.02	1.00		1.00
Salt and minerals	Cwt	23.00	0.00	0.00		0.00
Implants	Head	0.92	1.00	0.92		0.92
Dewormers	Head	2.99	1.00	2.99		2.99
Antibiotics	Head	0.00	1.00	0.00		0.00
Vaccines	Head	0.00	1.00	0.00		0.00
Fly control	Head	0.00	1.00	0.00		0.00
Fences, feeders, building repair	Year	7.16	0.58	4.18		4.18
Feeding fuel & repair	Hours	3.25	0.04	0.11		0.11
Rent	Acre	25.00	0.07	1.82		1.82
Labor (pasture & cattle)	Hours	10.00	1.58	15.77		15.77
Death loss	Dol.	496.44	1.54%	7.64	7.57	0.06
Marketing	Dol.	842.34	2.00%	16.85	16.85	
Interest on calf	Dol.	496.44	3.58%	17.79	17.79	
Interest on operating capital	Dol.	164.45	3.50%	5.76		5.76
Management charge	Head	10.00	1.00	10.00		10.00
TOTAL DIRECT EXPENSES				718.91	695.97	180.27
Direct cost of gain	$/cwt			53.74	48.20	43.54
FIXED EXPENSES						
(Assumes 300-head capacity for 7 months)						
Interest on investment	Year	289.62	2.33%	6.76		6.76
Insurance & taxes	Year	289.62	1.00%	2.90		2.90
Depreciation (prorated for 7 months)						
Fencing	Acre	4.02	0.04	0.17		0.17
Pasture planting equipment	Acre	7.88	0.04	0.34		0.34
Feeding equipment	Hours	2.50	0.04	0.09		0.09
Buildings & improvements	Year	11.63	0.58	6.79		6.79
TOTAL FIXED EXPENSES				17.03	0.00	17.03
TOTAL SPECIFIED EXPENSES				735.95	695.97	197.30
Total cost of gain	$/cwt			57.85	48.20	47.66
RETURN TO SPECIFIED EXPENSES				106.39	146.37	-39.98

Table 10B. DRYLOT treatment, 2004-2005 season, received only TMR — economic summary for owner of stocker steers and farmer.[1]

Item	TOTAL	OWNER	FARMER
	$/head	*$/head*	*$/head*
TOTAL INCOME	842.34	842.34	157.32
TOTAL DIRECT EXPENSES	718.91	695.97	180.27
TOTAL FIXED EXPENSES	17.03	0.00	17.03
TOTAL SPECIFIED EXPENSES	735.95	695.97	197.30
TOTAL SPECIFIED EXPENSES MINUS ANIMAL PURCHASE	239.51	199.53	197.30

[1]From previous table.

Table 10C. DRYLOT treatment, 2004-2005 season, received only TMR — economic summary for owner of stocker steers and farmer.[1]

Item	TOTAL	OWNER	FARMER	BREAK-EVEN COST OF GAIN[2]	
				TOTAL	FARMER
	$/head	*$/head*	*$/head*	*$/cwt*	*$/cwt*
RETURN TO SPECIFIED EXPENSES[3]	106.39	146.37	-39.98	57.85	47.66
RETURN TO LAND	108.22		108.22	57.41	47.22
RETURN TO LABOR	122.16		122.16	54.04	43.85
RETURN TO MANAGEMENT	116.39		116.39	55.44	45.24
RETURN TO CAPITAL	136.69	164.16	-27.47	50.53	44.63
RETURN TO LABOR & MANAGEMENT	238.55		238.55	51.63	41.43
RETURN TO LAND, LABOR & MANAGEMENT	346.77		346.77	51.19	40.99
RETURN TO LAND & CAPITAL	244.91	164.16	80.75	50.09	44.19
RETURN TO LAND, CAPITAL & MANAGEMENT	361.30	164.16	197.14	47.68	41.78

[1]From previous two tables.
[2]Break-even cost of gain when specified land, labor, management, and capital NOT included in expenses.
[3]Expenses include land, labor, management, and capital.

Table 11A. RG1 treatment, 2004-2005 season, ryegrass pasture stocked at 600 pounds per acre — income, expenses, and returns for owner of stocker steers and farmer.

Item	Unit	$/unit	No. units	TOTAL	OWNER	FARMER
				$/head	*$/head*	*$/head*
INCOME						
Feeder calf sale (w/shrink)	Cwt	104.25	8.08	842.34	842.34	
Gain payment	Cwt	38.00	4.14			157.32
Per head payment	Head	0.00	1.00			0.00
Excess death loss payment over 2%					0.00	
Total income	$/head			842.34	842.34	157.32
DIRECT EXPENSES						
Contract grazing	Cwt	38.00	4.14		157.32	
Feeder calf purchase	Cwt	126.00	3.94	496.44	496.44	
Pasture (Table 17)	Acre	144.32	0.66	94.77		94.77
Preconditioning feed	Cwt	6.16	0.00	0.00		0.00
Grower feed	Cwt	5.87	8.83	51.81		51.81
Hay	Ton	50.00	0.02	1.00		1.00
Salt and minerals	Cwt	23.00	0.15	3.45		3.45
Implants	Head	0.92	1.00	0.92		0.92
Dewormers	Head	2.99	1.00	2.99		2.99
Antibiotics	Head	0.00	1.00	0.00		0.00
Vaccines	Head	0.00	1.00	0.00		0.00
Fly control	Head	0.00	1.00	0.00		0.00
Fences, feeders, building repair	Year	8.66	0.58	5.05		5.05
Feeding fuel & repair	Hours	1.75	0.01	0.03		0.03
Rent	Acre	25.00	0.66	16.42		16.42
Labor (pasture & cattle)	Hours	10.00	1.90	19.02		19.02
Death loss	Dol.	496.44	1.54%	7.64	7.57	0.06
Marketing	Dol.	842.34	2.00%	16.85	16.85	
Interest on calf	Dol.	496.44	3.58%	17.79	17.79	
Interest on operating capital	Dol.	195.45	3.50%	6.84		6.84
Management charge	Head	10.00	1.00	10.00		10.00
TOTAL DIRECT EXPENSES				751.01	695.97	212.36
Direct cost of gain	$/cwt			61.49	48.20	51.29
FIXED EXPENSES						
(Assumes 300-head capacity for 7 months)						
Interest on investment	Year	243.70	2.33%	5.69		5.69
Insurance & taxes	Year	243.70	1.00%	2.44		2.44
Depreciation (prorated for 7 months)						
Fencing	Acre	2.26	0.38	0.86		0.86
Pasture planting equipment	Acre	7.88	0.38	3.02		3.02
Feeding equipment	Hours	0.82	0.01	0.01		0.01
Buildings & improvements	Year	6.63	0.58	3.87		3.87
TOTAL FIXED EXPENSES				15.89	0.00	15.89
TOTAL SPECIFIED EXPENSES				766.89	695.97	228.24
Total cost of gain	$/cwt			65.33	48.20	55.13
RETURN TO SPECIFIED EXPENSES				75.45	146.37	-70.92

Table 11B. RG1 treatment, 2004-2005 season, ryegrass pasture stocked at 600 pounds per acre — economic summary for owner of stocker steers and farmer.[1]

Item	TOTAL	OWNER	FARMER
	$/head	*$/head*	*$/head*
TOTAL INCOME	842.34	842.34	157.32
TOTAL DIRECT EXPENSES	751.01	695.97	212.36
TOTAL FIXED EXPENSES	15.89	0.00	15.89
TOTAL SPECIFIED EXPENSES	766.89	695.97	228.24
TOTAL SPECIFIED EXPENSES MINUS ANIMAL PURCHASE	270.45	199.53	228.24

[1]From previous table.

Table 11C. RG1 treatment, 2004-2005 season, ryegrass pasture stocked at 600 pounds per acre — economic summary for owner of stocker steers and farmer.[1]

Item	TOTAL	OWNER	FARMER	BREAK-EVEN COST OF GAIN[2]	
				TOTAL	FARMER
	$/head	*$/head*	*$/head*	*$/cwt*	*$/cwt*
RETURN TO SPECIFIED EXPENSES[3]	75.45	146.37	-70.92	65.33	55.13
RETURN TO LAND	91.86		91.86	61.36	51.17
RETURN TO LABOR	94.46		94.46	60.73	50.54
RETURN TO MANAGEMENT	85.45		85.45	62.91	52.72
RETURN TO CAPITAL	105.76	164.16	-58.40	58.00	52.11
RETURN TO LABOR & MANAGEMENT	179.91		179.91	58.32	48.12
RETURN TO LAND, LABOR & MANAGEMENT	271.78		271.78	54.35	44.16
RETURN TO LAND & CAPITAL	197.63	164.16	33.47	54.04	48.14
RETURN TO LAND, CAPITAL & MANAGEMENT	283.08	164.16	118.92	51.62	45.72

[1]From previous two tables.
[2]Break-even cost of gain when specified land, labor, management, and capital NOT included in expenses.
[3]Expenses include land, labor, management, and capital.

Table 12A. RG2 treatment, 2004-2005 season, ryegrass pasture stocked at 900 pounds per acre — income, expenses, and returns for owner of stocker steers and farmer.

Item	Unit	$/unit	No. units	TOTAL	OWNER	FARMER
				$/head	*$/head*	*$/head*
INCOME						
Feeder calf sale (w/shrink)	Cwt	104.25	8.08	842.34	842.34	
Gain payment	Cwt	38.00	4.14			157.32
Per head payment	Head	0.00	1.00			0.00
Excess death loss payment over 2%					0.00	
Total income	$/head			842.34	842.34	157.32
DIRECT EXPENSES						
Contract grazing	Cwt	38.00	4.14		157.32	
Feeder calf purchase	Cwt	126.00	3.94	496.44	496.44	
Pasture (Table 17)	Acre	144.32	0.44	63.18		63.18
Preconditioning feed	Cwt	6.16	0.00	0.00		0.00
Grower feed	Cwt	5.87	8.52	50.04		50.04
Hay	Ton	50.00	0.02	1.00		1.00
Salt and minerals	Cwt	23.00	0.15	3.45		3.45
Implants	Head	0.92	1.00	0.92		0.92
Dewormers	Head	2.99	1.00	2.99		2.99
Antibiotics	Head	0.00	1.00	0.00		0.00
Vaccines	Head	0.00	1.00	0.00		0.00
Fly control	Head	0.00	1.00	0.00		0.00
Fences, feeders, building repair	Year	8.43	0.58	4.92		4.92
Feeding fuel & repair	Hours	1.75	0.01	0.02		0.02
Rent	Acre	25.00	0.44	10.94		10.94
Labor (pasture & cattle)	Hours	10.00	1.77	17.72		17.72
Death loss	Dol.	496.44	1.54%	7.64	7.57	0.06
Marketing	Dol.	842.34	2.00%	16.85	16.85	
Interest on calf	Dol.	496.44	3.58%	17.79	17.79	
Interest on operating capital	Dol.	155.18	3.50%	5.43		5.43
Management charge	Head	10.00	1.00	10.00		10.00
TOTAL DIRECT EXPENSES				709.32	695.97	170.67
Direct cost of gain	$/cwt			51.42	48.20	41.23
FIXED EXPENSES						
(Assumes 300-head capacity for 7 months)						
Interest on investment	Year	234.20	2.33%	5.46		5.46
Insurance & taxes	Year	234.20	1.00%	2.34		2.34
Depreciation (prorated for 7 months)						
Fencing	Acre	2.84	0.26	0.73		0.73
Pasture planting equipment	Acre	7.88	0.26	2.01		2.01
Feeding equipment	Hours	0.82	0.01	0.01		0.01
Buildings & improvements	Year	6.63	0.58	3.87		3.87
TOTAL FIXED EXPENSES				14.43	0.00	14.43
TOTAL SPECIFIED EXPENSES				723.75	695.97	185.10
Total cost of gain	$/cwt			54.91	48.20	44.71
RETURN TO SPECIFIED EXPENSES				118.59	146.37	-27.78

Table 12B. RG2 treatment, 2004-2005 season, ryegrass pasture stocked at 900 pounds per acre — economic summary for owner of stocker steers and farmer.[1]

Item	TOTAL	OWNER	FARMER
	$/head	*$/head*	*$/head*
TOTAL INCOME	842.34	842.34	157.32
TOTAL DIRECT EXPENSES	709.32	695.97	170.67
TOTAL FIXED EXPENSES	14.43	0.00	14.43
TOTAL SPECIFIED EXPENSES	723.75	695.97	185.10
TOTAL SPECIFIED EXPENSES MINUS ANIMAL PURCHASE	227.31	199.53	185.10

[1]From previous table.

Table 12C. RG2 treatment, 2004-2005 season, ryegrass pasture stocked at 900 pounds per acre — economic summary for owner of stocker steers and farmer.[1]

Item	TOTAL	OWNER	FARMER	BREAK-EVEN COST OF GAIN[2]	
				TOTAL	FARMER
	$/head	*$/head*	*$/head*	*$/cwt*	*$/cwt*
RETURN TO SPECIFIED EXPENSES[3]	118.59	146.37	-27.78	54.91	44.71
RETURN TO LAND	129.54		129.54	52.26	42.07
RETURN TO LABOR	136.31		136.31	50.63	40.43
RETURN TO MANAGEMENT	128.59		128.59	52.49	42.29
RETURN TO CAPITAL	147.28	164.16	-16.88	47.98	42.08
RETURN TO LABOR & MANAGEMENT	264.90		264.90	48.21	38.02
RETURN TO LAND, LABOR & MANAGEMENT	394.43		394.43	45.57	35.37
RETURN TO LAND & CAPITAL	276.81	164.16	112.65	45.33	39.43
RETURN TO LAND, CAPITAL & MANAGEMENT	405.40	164.16	241.24	42.92	37.02

[1]From previous two tables.
[2]Break-even cost of gain when specified land, labor, management, and capital NOT included in expenses.
[3]Expenses include land, labor, management, and capital.

Table 13A. DRYLOT treatment, 2005-2006 season, received only TMR — income, expenses, and returns for owner of stocker steers and farmer.

Item	Unit	$/unit	No. units	TOTAL	OWNER	FARMER
				$/head	*$/head*	*$/head*
INCOME						
Feeder calf sale (w/shrink)	Cwt	91.34	6.99	638.47	638.47	
Gain payment	Cwt	40.00	2.84			113.60
Per head payment	Head	0.00	1.00			0.00
Excess death loss payment over 2%					0.00	
Total income	$/head			638.47	638.47	113.60
DIRECT EXPENSES						
Contract grazing	Cwt	40.00	2.84		113.60	
Feeder calf purchase	Cwt	147.00	4.15	610.05	610.05	
Pasture(Table 18)	Acre	124.24	0.00	0.00		0.00
Preconditioning feed	Cwt	6.16	2.17	13.37		13.37
Grower feed	Cwt	5.87	16.80	98.64		98.64
Hay	Ton	50.00	0.00	0.00		0.00
Salt and minerals	Cwt	23.00	0.00	0.00		0.00
Implants	Head	0.92	1.00	0.92		0.92
Dewormers	Head	2.99	1.00	2.99		2.99
Antibiotics	Head	0.00	1.00	0.00		0.00
Vaccines	Head	0.00	1.00	0.00		0.00
Fly control	Head	0.00	1.00	0.00		0.00
Fences, feeders, building repair	Year	5.56	0.58	3.25		3.25
Feeding fuel & repair	Hours	6.74	0.03	0.18		0.18
Rent	Acre	25.00	0.00	0.00		0.00
Labor (pasture & cattle)	Hours	10.00	1.34	13.38		13.38
Death loss	Dol.	610.05	1.43%	8.72	8.67	0.04
Marketing	Dol.	638.47	2.00%	12.77	12.77	
Interest on calf	Dol.	610.05	3.58%	21.86	21.86	
Interest on operating capital	Dol.	132.73	3.50%	4.65		4.65
Management charge	Head	10.00	1.00	10.00		10.00
TOTAL DIRECT EXPENSES				800.77	766.95	147.42
Direct cost of gain	$/cwt			67.16	55.25	51.91
FIXED EXPENSES						
(Assumes 300-head capacity for 7 months)						
Interest on investment	Year	231.61	2.33%	5.40		5.40
Insurance & taxes	Year	231.61	1.00%	2.32		2.32
Depreciation (prorated for 7 months)						
Fencing	Acre	8.99	0.04	0.35		0.35
Pasture planting equipment	Acre	7.78	0.00	0.00		0.00
Feeding equipment	Hours	2.08	0.03	0.06		0.06
Buildings & improvements	Year	11.63	0.58	6.79		6.79
TOTAL FIXED EXPENSES				14.91	0.00	14.91
TOTAL SPECIFIED EXPENSES				815.69	766.95	162.33
Total cost of gain	$/cwt			72.41	55.25	57.16
RETURN TO SPECIFIED EXPENSES				-177.22	-128.49	-48.73

Table 13B. DRYLOT treatment, 2005-2006 season, received only TMR — economic summary for owner of stocker steers and farmer.[1]

Item	TOTAL	OWNER	FARMER
	$/head	*$/head*	*$/head*
TOTAL INCOME	638.47	638.47	113.60
TOTAL DIRECT EXPENSES	800.77	766.95	147.42
TOTAL FIXED EXPENSES	14.91	0.00	14.91
TOTAL SPECIFIED EXPENSES	815.69	766.95	162.33
TOTAL SPECIFIED EXPENSES MINUS ANIMAL PURCHASE	205.64	156.90	162.33

[1]From previous table.

Table 13C. DRYLOT treatment, 2005-2006 season, received only TMR — economic summary for owner of stocker steers and farmer.[1]

Item	TOTAL	OWNER	FARMER	BREAK-EVEN COST OF GAIN[2]	
				TOTAL	FARMER
	$/head	*$/head*	*$/head*	*$/cwt*	*$/cwt*
RETURN TO SPECIFIED EXPENSES[3]	-177.22	-128.49	-48.73	72.41	57.16
RETURN TO LAND	-177.22		-177.22	72.41	57.16
RETURN TO LABOR	-163.83		-163.83	67.69	52.45
RETURN TO MANAGEMENT	-167.22		-167.22	68.89	53.64
RETURN TO CAPITAL	-145.31	-106.63	-38.68	61.17	53.62
RETURN TO LABOR & MANAGEMENT	-331.05		-331.05	64.17	48.93
RETURN TO LAND, LABOR & MANAGEMENT	-508.27		-508.27	64.17	48.93
RETURN TO LAND & CAPITAL	-322.53	-106.63	-215.90	61.17	53.62
RETURN TO LAND, CAPITAL & MANAGEMENT	-489.75	-106.63	-383.12	57.65	50.10

[1]From previous two tables.
[2]Break-even cost of gain when specified land, labor, management, and capital NOT included in expenses.
[3]Expenses include land, labor, management, and capital.

Table 14A. RG1 treatment, 2005-2006 season, ryegrass pasture stocked at 600 pounds per acre — income, expenses, and returns for owner of stocker steers and farmer.

Item	Unit	$/unit	No. units	TOTAL	OWNER	FARMER
				$/head	*$/head*	*$/head*
INCOME						
Feeder calf sale (w/shrink)	Cwt	91.34	6.99	638.47	638.47	
Gain payment	Cwt	40.00	2.84			113.60
Per head payment	Head	0.00	1.00			0.00
Excess death loss payment over 2%					0.00	
Total income	$/head			638.47	638.47	113.60
DIRECT EXPENSES						
Contract grazing	Cwt	40.00	2.84		113.60	
Feeder calf purchase	Cwt	147.00	4.15	610.05	610.05	
Pasture (Table 18)	Acre	93.99	0.69	65.01		65.01
Preconditioning feed	Cwt	6.16	2.17	13.37		13.37
Grower feed	Cwt	5.87	2.76	16.22		16.22
Hay	Ton	50.00	0.00	0.00		0.00
Salt and minerals	Cwt	23.00	0.15	3.45		3.45
Implants	Head	0.92	1.00	0.92		0.92
Dewormers	Head	2.99	1.00	2.99		2.99
Antibiotics	Head	0.00	1.00	0.00		0.00
Vaccines	Head	0.00	1.00	0.00		0.00
Fly control	Head	0.00	1.00	0.00		0.00
Fences, feeders, building repair	Year	6.53	0.58	3.81		3.81
Feeding fuel & repair	Hours	6.74	0.00	0.03		0.03
Rent	Acre	25.00	0.69	17.29		17.29
Labor (pasture & cattle)	Hours	10.00	1.73	17.25		17.25
Death loss	Dol.	610.05	1.43%	8.72	8.67	0.04
Marketing	Dol.	638.47	2.00%	12.77	12.77	
Interest on calf	Dol.	610.05	3.58%	21.86	21.86	
Interest on operating capital	Dol.	140.34	3.50%	4.91		4.91
Management charge	Head	10.00	1.00	10.00		10.00
TOTAL DIRECT EXPENSES				808.65	766.95	155.29
Direct cost of gain	$/cwt			69.93	55.25	54.68
FIXED EXPENSES						
(Assumes 300-head capacity for 7 months)						
Interest on investment	Year	269.62	2.33%	6.29		6.29
Insurance & taxes	Year	269.62	1.00%	2.70		2.70
Depreciation (prorated for 7 months)						
Fencing	Acre	2.19	0.40	0.88		0.88
Pasture planting equipment	Acre	7.78	0.40	3.14		3.14
Feeding equipment	Hours	2.08	0.00	0.01		0.01
Buildings & improvements	Year	11.63	0.58	6.79		6.79
TOTAL FIXED EXPENSES				19.81	0.00	19.81
TOTAL SPECIFIED EXPENSES				828.45	766.95	175.10
Total cost of gain	$/cwt			76.90	55.25	61.66
RETURN TO SPECIFIED EXPENSES				-189.99	-128.49	-61.50

Table 14B. RG1 treatment, 2005-2006 season, ryegrass pasture stocked at 600 pounds per acre — economic summary for owner of stocker steers and farmer.[1]

Item	TOTAL	OWNER	FARMER
	$/head	*$/head*	*$/head*
TOTAL INCOME	638.47	638.47	113.60
TOTAL DIRECT EXPENSES	808.65	766.95	155.29
TOTAL FIXED EXPENSES	19.81	0.00	19.81
TOTAL SPECIFIED EXPENSES	828.45	766.95	175.10
TOTAL SPECIFIED EXPENSES MINUS ANIMAL PURCHASE	218.40	156.90	175.10

[1]From previous table.

Table 14C. RG1 treatment, 2005-2006 season, ryegrass pasture stocked at 600 pounds per acre — economic summary for owner of stocker steers and farmer.[1]

Item	TOTAL	OWNER	FARMER	BREAK-EVEN COST OF GAIN[2]	
				TOTAL	FARMER
	$/head	*$/head*	*$/head*	*$/cwt*	*$/cwt*
RETURN TO SPECIFIED EXPENSES[3]	-189.99	-128.49	-61.50	76.90	61.66
RETURN TO LAND	-172.70		-172.70	70.81	55.57
RETURN TO LABOR	-172.74		-172.74	70.83	55.58
RETURN TO MANAGEMENT	-179.99		-179.99	73.38	58.13
RETURN TO CAPITAL	-156.92	-106.63	-50.30	65.26	57.71
RETURN TO LABOR & MANAGEMENT	-352.72		-352.72	67.31	52.06
RETURN TO LAND, LABOR & MANAGEMENT	-525.42		-525.42	61.22	45.97
RETURN TO LAND & CAPITAL	-329.62	-106.63	-222.99	59.17	51.62
RETURN TO LAND, CAPITAL & MANAGEMENT	-509.61	-106.63	-402.98	55.65	48.10

[1]From previous two tables.
[2]Break-even cost of gain when specified land, labor, management, and capital NOT included in expenses.
[3]Expenses include land, labor, management, and capital.

Table 15A. RG2 treatment, 2005-2006 season, ryegrass pasture stocked at 900 pounds per acre — income, expenses, and returns for owner of stocker steers and farmer.

Item	Unit	$/unit	No. units	TOTAL	OWNER	FARMER
				$/head	*$/head*	*$/head*
INCOME						
Feeder calf sale (w/shrink)	Cwt	91.34	6.99	638.47	638.47	
Gain payment	Cwt	40.00	2.84			113.60
Per head payment	Head	0.00	1.00			0.00
Excess death loss payment over 2%					0.00	
Total income	$/head			638.47	638.47	113.60
DIRECT EXPENSES						
Contract grazing	Cwt	40.00	2.84		113.60	
Feeder calf purchase	Cwt	147.00	4.15	610.05	610.05	
Pasture (Table 18)	Acre	93.99	0.46	43.34		43.34
Preconditioning feed	Cwt	6.16	2.17	13.37		13.37
Grower feed	Cwt	5.87	2.76	16.22		16.22
Hay	Ton	50.00	0.00	0.00		0.00
Salt and minerals	Cwt	23.00	0.15	3.45		3.45
Implants	Head	0.92	1.00	0.92		0.92
Dewormers	Head	2.99	1.00	2.99		2.99
Antibiotics	Head	0.00	1.00	0.00		0.00
Vaccines	Head	0.00	1.00	0.00		0.00
Fly control	Head	0.00	1.00	0.00		0.00
Fences, feeders, building repair	Year	6.29	0.58	3.67		3.67
Feeding fuel & repair	Hours	6.74	0.00	0.03		0.03
Rent	Acre	25.00	0.46	11.53		11.53
Labor (pasture & cattle)	Hours	10.00	1.59	15.89		15.89
Death loss	Dol.	610.05	1.43%	8.72	8.67	0.04
Marketing	Dol.	638.47	2.00%	12.77	12.77	
Interest on calf	Dol.	610.05	3.58%	21.86	21.86	
Interest on operating capital	Dol.	111.40	3.50%	3.90		3.90
Management charge	Head	10.00	1.00	10.00		10.00
TOTAL DIRECT EXPENSES				778.70	766.95	125.34
Direct cost of gain	$/cwt			59.38	55.25	44.13
FIXED EXPENSES						
(Assumes 300-head capacity for 7 months)						
Interest on investment	Year	259.87	2.33%	6.06		6.06
Insurance & taxes	Year	259.87	1.00%	2.60		2.60
Depreciation (prorated for 7 months)						
Fencing	Acre	2.76	0.27	0.74		0.74
Pasture planting equipment	Acre	7.78	0.27	2.09		2.09
Feeding equipment	Hours	2.08	0.00	0.01		0.01
Buildings & improvements	Year	11.63	0.58	6.79		6.79
TOTAL FIXED EXPENSES				18.29	0.00	18.29
TOTAL SPECIFIED EXPENSES				796.99	766.95	143.63
Total cost of gain	$/cwt			65.82	55.25	50.58
RETURN TO SPECIFIED EXPENSES				-158.52	-128.49	-30.03

Table 15B. RG2 treatment, 2005-2006 season, ryegrass pasture stocked at 900 pounds per acre — economic summary for owner of stocker steers and farmer.[1]

Item	TOTAL	OWNER	FARMER
	$/head	*$/head*	*$/head*
TOTAL INCOME	638.47	638.47	113.60
TOTAL DIRECT EXPENSES	778.70	766.95	125.34
TOTAL FIXED EXPENSES	18.29	0.00	18.29
TOTAL SPECIFIED EXPENSES	796.99	766.95	143.63
TOTAL SPECIFIED EXPENSES MINUS ANIMAL PURCHASE	186.94	156.90	143.63

[1]From previous table.

Table 15C. RG2 treatment, 2005-2006 season, ryegrass pasture stocked at 900 pounds per acre — economic summary for owner of stocker steers and farmer.[1]

Item	TOTAL	OWNER	FARMER	BREAK-EVEN COST OF GAIN[2]	
				TOTAL	FARMER
	$/head	*$/head*	*$/head*	*$/cwt*	*$/cwt*
RETURN TO SPECIFIED EXPENSES[3]	-158.52	-128.49	-30.03	65.82	50.58
RETURN TO LAND	-146.99		-146.99	61.76	46.52
RETURN TO LABOR	-142.64		-142.64	60.23	44.98
RETURN TO MANAGEMENT	-148.52		-148.52	62.30	47.05
RETURN TO CAPITAL	-126.70	-106.63	-20.07	54.62	47.07
RETURN TO LABOR & MANAGEMENT	-291.16		-291.16	56.71	41.46
RETURN TO LAND, LABOR & MANAGEMENT	-438.15		-438.15	52.65	37.40
RETURN TO LAND & CAPITAL	-273.69	-106.63	-167.06	50.56	43.01
RETURN TO LAND, CAPITAL & MANAGEMENT	-422.21	-106.63	-315.59	47.04	39.49

[1]From previous two tables.
[2]Break-even cost of gain when specified land, labor, management, and capital NOT included in expenses.
[3]Expenses include land, labor, management, and capital.

Table 16. Pasture budget for the 2003-2004 season.

Item	Unit	$/unit	No. units	TOTAL
				$/acre
DIRECT EXPENSES				
Fertilizer				
Lime DL	ton	26.00	0.33	8.58
Liquid N (32%)	cwt	6.50	2.13	13.85
Am Nitrate (34% N)[1]	cwt	12.85	4.00	51.40
DAP (18-46-0)	cwt	12.05	0.65	7.83
Am Sulf (21-0-0-24)	cwt	9.75	1.00	9.75
Potash (60% K_2O)	cwt	9.35	0.50	4.68
Seed				
Jackson ryegrass	lb	0.35	25.00	8.85
Herbicide				
2,4D	pt	1.71	2.00	3.42
Custom spraying	acre	3.25	1.00	3.25
Diesel fuel				
Tractors	gal	0.97	2.21	2.14
Repair & maintenance				
Implements	acre	1.47	1.00	1.47
Tractors	acre	2.03	1.00	2.03
TOTAL DIRECT EXPENSES				117.25
FIXED EXPENSES				
Implements	acre	3.37	1.00	3.37
Tractors	acre	3.40	1.00	3.40
TOTAL FIXED EXPENSES				6.77
TOTAL SPECIFIED EXPENSES				124.02

[1]Ammonium nitrate applied at the rate of 3.5 and 4 hundredweight per acre for treatments RG1 and RG2, respectively. Pasture in RG1 had adequate growth to meet animal requirements without the extra nitrogen fertilizer.

Table 17. Pasture budget for the 2004-2005 season.				
Item	**Unit**	**$/unit**	**No. units**	**TOTAL**
				$/acre
DIRECT EXPENSES				
Fertilizer				
Lime DL	ton	34.57	0.33	11.41
Liquid N (32%)	cwt	11.75	2.13	25.03
Am Nitrate (34% N)	cwt	13.75	4.00	55.00
DAP (18-46-0)	cwt	14.85	0.65	9.65
Am Sulf (21-0-0-24)	cwt	10.75	1.00	10.75
Potash (60% K_2O)	cwt	12.55	0.50	6.28
Seed				
Jackson ryegrass	lb	0.35	25.00	8.85
Herbicide				
2,4D	pt	1.71	2.00	3.42
Custom spraying	acre	5.50	1.00	5.50
Diesel fuel				
Tractors	gal	1.69	2.21	3.73
Repair & maintenance				
Implements	acre	2.29	1.00	2.29
Tractors	acre	2.41	1.00	2.41
TOTAL DIRECT EXPENSES				144.32
FIXED EXPENSES				
Implements	acre	3.95	1.00	3.95
Tractors	acre	3.93	1.00	3.93
TOTAL FIXED EXPENSES				7.88
TOTAL SPECIFIED EXPENSES				148.25

Table 18. Pasture budget for the 2005-2006 season.				
Item	**Unit**	**$/unit**	**No. units**	**TOTAL**
				$/acre
DIRECT EXPENSES				
Fertilizer				
Lime DL	ton	36.50	0.33	12.05
Liquid N (32%)	cwt	12.00	0.00	0.00
Am Nitrate (34% N)[1]	cwt	13.75	2.00	27.50
DAP (18-46-0)	cwt	14.85	0.65	9.65
Am Sulf (21-0-0-24)	cwt	11.25	1.00	11.25
Potash (60% K_2O)	cwt	12.55	0.50	6.28
Seed				
Jackson ryegrass	lb	0.35	25.00	8.85
Herbicide				
2,4D	pt	1.71	2.00	3.42
Custom spraying	acre	5.50	1.00	5.50
Diesel fuel				
Tractors	gal	2.50	2.21	5.53
Repair & maintenance				
Implements	acre	1.54	1.00	1.54
Tractors	acre	2.43	1.00	2.43
TOTAL DIRECT EXPENSES			93.99	
FIXED EXPENSES				
Implements	acre	3.25	1.00	3.25
Tractors	acre	4.53	1.00	4.53
TOTAL FIXED EXPENSES				7.78
TOTAL SPECIFIED EXPENSES				101.77

[1]Ammonium nitrate applied at the rate of 2 hundredweight per acre due to severe fall and winter drought that limited the number of grazing days. Pasture had adequate growth to meet animal requirements in the spring once it started growing.

IMPLICATIONS

Owners of the cattle did not pay enough on weight gain contracts ($35 to $40 per hundredweight) for farmers to recover their costs under the conditions of this study. In 2006-2007, owners were paying farmers $35 to $45 per hundredweight for weight gain contracts on 500-pound cattle on wheat pastures in Texas and Oklahoma. Until wheat pasture farmers begin receiving higher payments for weight gains, traditional grazing of ryegrass pastures in Mississippi will remain noncompetitive. For cattle weighing 700 pounds or more, the cost of gain in western feedlots is $75 to $85 per hundredweight until they finish at 1,200 pounds (personal communications, Dan Childs, Ag Specialist, Noble Foundation, Ardmore, Oklahoma). The TMR used in this study was effective for supplementation of pasture and for increasing stocking rates. By knowing the COG, cattle owners and farmers can both agree on a fair and equitable contract.

This research has improved our understanding of ruminant nutrition and supplementation strategies. Immediate positive impact on farm profitability can be realized by better balancing of cattle diets and nutritional management strategies. Economic efficiency of forage-based livestock production can be improved. Limited-resource farmers will be able to apply the findings of this research directly to their operations, as few additional capital expenditures will be needed to adapt new supplementation strategies for the feeding of low-quality forages.

REFERENCES

Kunkle, W.E. 2001. Strategies for Cost Effective Supplementation of Beef Cattle. Florida Coop. Ext. Service, Institute of Food and Agricultural Sciences, Univ. Florida. Document SS-ANS-14, one of a series of the Animal Science Dept. (http://edis.ifas.ufl.edu/AN085).

McCann, M.A., and R. Stewart. 2000. Use of Alternate Feeds for Beef Cattle. Coop. Ext. Service, Univ. Georgia College of Agricultural and Environmental Sciences Leaflet 406/Reprinted April. (http://pubs.caes.uga.edu/caespubs/pubcd/l406-w.htm).

NRC. 1996. Nutrient Requirements of Beef Cattle. 7th ed. Natl. Acad. Press, Washington, DC.

Rankin, D. 2007. By-Product Feeds for Alabama Beef Cattle. Alabama Cooperative Extension Service. (http://www.aces.edu/pubs/docs/A/ANR-1237/).

Mississippi State University

Printed on Recycled Paper