THE EFFECT OF BACKGROUNDING SYSTEM AND CATTLE TYPE ON NET RETURN

by

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Beef cattle production in Florida encompasses a wide range of animal types and production systems. Crucial to the success of a post-weaning production system is an appropriate match of animal type with a feeding program. The purpose of this paper is to report the results of recent feeding trials conducted at the Subtropical Agricultural Research Station in Brooksville. In these trials, steers which encompassed a wide range of cattle types, were placed in five different backgrounding-finishing systems. The effect of animal type and feeding system on animal performance was reported at the 1988 Beef Cattle Short Course (Kunkle et al.). In this paper, costs and returns for each animal are computed, and the effect of cattle type and feeding system on net returns is examined.

ESTIMATION OF COSTS AND RETURNS

Steers were procured at Florida auction markets in November, 1985 and September, 1986. Cattle were transported to the ARS/IFAS Subtropical Beef Cattle Research Station near Brooksville. All cattle were put through a preconditioning program. Each year, steers were assigned to one of five feeding programs. In this paper, these five feeding programs are called system 1 through system 5. System 1 involves only feedlot feeding of cattle. Animals in this system were randomly assigned to two groups with one group finished at Brooksville and the other group transported to the North Florida Research and Education Center at Quincy and finished in those feedlot facilities. All animals in systems 2 through 5 were placed on bahia pastures in early December. Animals grazed on these pastures and were offered round bales of bahiagrass hay cut in September. Animals in systems 2 and 3 were supplemented in both years with 1.0 lb/head/day of soybean meal. In 1985-86, steers in systems 4 and 5 were supplemented with 7.1 lb/head/day of a molasses-soybean meal slurry. In 1986-87, steers in systems 4 and 5 were fed 6.2 lb/head/day of 75% ground shelled corn and 25% soybean meal.

In April of each year, steers in systems 2 and 4 were placed on bahia pastures, and steers in systems 3 and 5 were placed on perennial peanut pastures. In early September, all steers in systems 2 through 5 were placed in feedlots. Animals in each system were randomly assigned to two groups. One group was finished in Brooksville and the other group was finished in Quincy. In the feedlot, all animals were fed a ration which averaged 80% shell corn, 10% cottonseed hulls, and 10% protein supplement. The animals were fed until they reached an estimated 0.45 in. fat over the ribeye then were slaughtered for carcass evaluation. Based on the carcass evaluation, each carcass was assigned a yield and quality grade.

Using data from Livestock, Meat, and Wool Market News, a matrix of carcass prices based on yield and quality grade was estimated. Using $1.00/lb for Choice-3 as the base price, the premiums and discounts for other grade-yield combinations are shown in Table 1. Any carcass weighing less than 550 pounds was reduced 8% in value. Using the appropriate price in Table 1 and multiplying by carcass weight gave gross revenue for each animal.

Costs for each system were based on the cash costs associated with preconditioning, winter grazing, summer grazing and feedlot finishing. These costs are shown in Table 2. Costs for perennial peanut pasture include pro-rata establishment costs. The estimated establishment cost is $389.20 per acre. This cost was depreciated over 10 years using the straight line method, and interest was charged using a 12% rate. No charge was made for winter bahia pasture.

Stocking rates in the summer grazing programs were

based on spring forage availability, so large quantities of excess forage were produced in the summer months. This excess forage was harvested for hay, and a credit for hay was applied to pasture costs. Interest on operating capital was charged using a 12% interest rate. Stocking rate for both bahia and perennial peanut grazing was approximately .7 hd/ac.

Upon purchase, each steer was visually evaluated for a number of traits including weighed amd frame size, condition, muscling, temperament, bone, chest capacity and breed (allocated to Brahman, Continental, and English). Two Florida-based order buyers were asked to provide bids for each animal at the beginning of the trial in December of each year. The maximum of these bids was taken to be the purchase price of the calf.

Net revenue per animal was computed by subtracting all feeding costs and initial animal costs from gross revenue. Average net revenue per head for each system is shown in Table 3. Overall net revenue per head ranged from -$249.07 to $232.93 with an average of $-39.20.

RESULTS AND DISCUSSIONS

In Table 3 we find that on the basis of average net return for all cattle, system 5 ranked highest, followed by system 1, system 4, system 3 and system 2. In absolute terms, system 5 and system 1 exhibited similar performance with systems 2, 3 and 4 trailing behind. The relative success of system 5 is that animals from this group had the highest average carcass weight. (Table 4) Although a relatively high proportion of the animals in this system graded Choice, a relatively high proportion also graded Standard. System 5 also, on average, had poorer yield grades. Higher carcass weight offset lower selling prices due to lower quality and yield grades. System 1 fared relatively well because a high proportion of animals in this group graded Choice, and few animals in this group graded Standard. Average yield grade was also best for system 1.

Systems 2 and 3 are those systems in which a low level of nutrition was provided in the winter period. The poor average net returns compared to the other systems suggests that at least a moderate level of nutrition in the cool season should be maintained.

The primary focus of this paper is to examine the joint impact of cattle type and feeding system on net returns. A two-way analysis of each trait and feeding system was conducted. Limited space does not allow a complete discussion of those results. Several interesting results are presented.

Medium frame cattle show higher net returns in systems 1, 2, and 4, while large frame cattle fare better in systems 3 and 5 (Table 3). Systems 3 and 5 are those which utilize grazing on perennial peanuts in the summer. These results suggest that the larger frame cattle profit from the higher level of nutrition provided by the perennial peanut pasture during the summer phase.

Net returns by system and initial condition suggest that relatively fleshy cattle show the poorest net returns (Table 3). Thin cattle did well in systems 3 and 5 with an average net return of $75.56 for thin cattle in system 5. This result confirms the concept that thin cattle, when confronted with adequate nutrition, will be efficient in feed conversion and provide higher net returns than fleshier cattle.

Except for system 1, average net returns were much lower in 1985-6 compared to 1986-7 (Table 3). The spring of 1986 was dry in the Brooksville area and pasture growth was poor. In 1987, ample rainfall was received throughout the warm season, and forage was abundant. Much of the explanation of higher net returns for the perennial peanut systems is that a large quantity of hay was harvested in 1987 which significantly reduced grazing costs for that year.

Animals were divided into three groups based upon the initial price determined by the maximum of the bids provided by two order buyers (Table 3). In general, less expensive cattle show higher net returns. In the case of system 5, less expensive cattle far out perform the other two groups.

The results for bone, chest capacity, initial weight and breed showed little discernable pattern. Larger boned cattle did not exhibit higher net returns. Animals with 30 to 40 percent Brahman breeding performed better in system 5, but otherwise Brahman breeding had little effect.

The relationships of visual characteristics to buyers' price are shown in Table 5. This shows the average initial prices of the different types of cattle and reflects some of the pricing relationship of different weights and types of cattle in the fall of 1985 and 1986.

CONCLUDING REMARKS

The results of grazing trials which focused on the impact of animal type and alternative backgrounding systems on costs and returns has been presented. The results suggest that backgrounding system and animal type do interact and can have large impact on net returns. Thin and large frame cattle appear to benefit from higher levels of nutrition provided by perennial peanuts. Medium frame cattle do best in direct to the feedlot and bahia-based systems. Weather greatly influences net returns in programs utilizing perennial peanuts. Further work needs to be done to better quantify the interaction between feeding program and animal type.

REFERENCES

Kunkle, W.E., A.C. Hammond, W.T. Butts, M.J. Williams, F.S. Baker, Jr., A.Z. Palmer, and T.H. Spreen. "Evaluation of the STARS Stockering and Feeding Study." Proceedings of the 37th Annual Beef Cattle Short Course Animal Science Dept., University of Florida, 1988, pp.67-74.

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Table 1. CARCASS PRICES FOR DIFFERENT QUALITY AND YIELD GRADES ($/LB.)[a]

Quality Grade	Yield Grade 2	3	4
Choice	1.0068	1.0000	0.8593
Select	0.9253	0.9185	0.7778
Standard	0.8481	0.8413	0.7006

[a] Carcasses weighing less than 550 lbs. had carcass prices reduced 8%.

Table 2. FEED AND MISCELLANEOUS COSTS

Preconditioning	$22.30/hd
Feedlot Yardage	$ 0.25/hd/day

	($/ton)
Hay	50
Soybean Meal	250
Molasses/SB slurry	98
Corn-Soybean Meal	134
Feedlot Ration	120

	Bahia ($/Ac)	Peanut ($/Ac)
Total Pasture Costs	38.40	105.09
Hay Credit		
1st Year	-12.50	-35.00
2nd Year	-12.50	-77.50
Adjusted Pasture Costs		
1st Year	25.90	70.09
2nd Year	25.90	27.59

Table 3. EFFECTS OF SYSTEM, FRAME SIZE, CONDITION, YEAR AND INITIAL BUYER PRICE ON NET RETURN, $.

	System 1 Feedlot	2 Low Bahia	3 Low Peanut	4 Medium Bahia	5 Medium Peanut	All
All Cattle	-11.41	-86.46	-67.04	-33.22	-8.98	-39.20
Frame Size						
Small	-16.09	-123.72	-105.77	-40.41	-45.00	-61.54
Medium	-6.31	-60.94	-64.71	-28.88	-9.68	-33.35
Large	-14.16	-97.06	-47.26	-33.69	17.38	-31.17
Condition						
Thin	-0.95	-48.06	0.63	-30.84	75.56	8.06
Medium	-10.67	-79.08	-61.20	-20.67	-30.49	-38.53
Fleshy	-32.27	-141.99	-134.20	-84.76	-23.27	-85.82
Year						
'85-86	-1.97	-89.10	-135.84	-53.37	-72.41	-70.99
'86-87	-18.30	-82.80	-0.99	-11.40	54.44	-7.67
Initial Buyer Price, $/100 lb.						
< 61	19.90	-22.58	-8.47	-30.98	73.03	10.45
61 - 64	-25.83	-107.08	-78.09	-25.99	-42.62	-53.89
> 64	-22.21	-137.33	-118.47	-64.97	-40.57	-67.80

Table 4. SYSTEM EFFECTS ON CARCASS CHARACTERISTICS

	System					
	1	2	3	4	5	
	Feedlot	Low Bahia	Low Peanut	Medium Bahia	Medium Peanut	All
Hot Carcass Weight, lb.	656	685	710	720	756	705
Fat Over Ribeye, in.	.49	.50	.52	.48	.54	.51
Quality Grade, % Carcasses						
Choice	27	23	22	18	31	22
Select	71	70	76	64	52	67
Standard	02	07	02	18	17	11
Yield Grade, % Carcasses						
2	61	37	39	46	35	45
3	37	56	53	46	50	47
4	02	07	08	08	15	08

Table 5.RELATIONSHIP OF WEIGHT AND VISUAL CHARACTERISTICS TO INITIAL BUYER PRICE

Characteristic	No. Steers	$/100 lb.
Initial Weight, lb.		
Under 425	52	64.04
425-500	92	61.71
over 500	105	61.93
Frame Size		
Small	58	63.90
Medium	110	61.82
Large	81	61.78
Condition		
Thin	38	61.28
Medium	170	62.28
Fleshy	41	63.36
Muscle		
Heavy	147	63.13
Medium	102	61.09
Temperament		
Docile	151	63.04
Slightly Aggressive	98	61.13
Bone		
Heavy	62	62.58
Average	148	62.55
Light	39	60.85
Chest Capacity		
High	90	62.78
Average	159	62.19
Proportion Brahman Breeding, %		
Under 30	77	63.15
30-40	96	62.59
Over 40	77	61.03