Alternative Cow-Calf and Stocker Production Systems in the Georgia Piedmont Area

G. CHRIS LANCE, GRADY V. CALVERT, AND WALLACE A. GRIFFEY

Highlight: *Economic analyses indicated that costs and returns were closely related to age of cattle, quality of forage, and cattle market prices in the Southeast. Brood cow-calf and stocker calf operations performed best when annual winter grazing was included in the production systems. Returns per acre to capital, land, and management during the 1966-1970 period were $18.37 for the winter cow-calf system with annual winter grazing and $10.87 for the summer cow-calf unit. Returns per acre to capital, land, and management during the 1963-1970 period were estimated at $6.46 for the summer stocker calf system and $41.00 for the winter stocker calf system with annual winter grazing. The summer cow-calf system and the winter stocker calf system were the best combination of systems to increase total beef production for the Piedmont area.*

Beef production offers considerable potential for expansion in the Southeast even though incomes have generally been reported as low from most beef systems in past studies (Allison, 1970). The Southeast is an important source of cattle for finishing in the midwest and western areas (Goodwin, 1965). In the Southeast the long growing seasons and mild winter temperatures are conducive to the production of forage. Uncertain weather conditions, cattle performance, and variable cattle prices are limitations that must be considered in planning beef operations.

Cow-calf and stocker calf production tests were designed and conducted at the Central Georgia Branch Experiment Station near Eatonton, Georgia, to supply more information on cattle performance, production requirements, and returns for alternative beef production systems in the Piedmont area. In an unusual feature of this study, managers of the production tests used their judgment in making management decisions to attempt to maximize net income, whereas most experimental projects adhere to a fixed experimental design regardless of economics. Management decisions made within individual years were influenced by weather conditions, animal performance, feed costs, and cattle prices. The results of these analyses should be applicable to similar areas in the Piedmont of Alabama and South Carolina.

The authors are instructor of agricultural economics, Georgia Station, Experiment, (Griffin); assistant professor and superintendent, Central Georgia Branch Experiment Station, Eatonton; University of Georgia College of Agriculture Experiment Stations. Mr. Griffey is now assistant superintendent, Piedmont Substation, Alabama Agricultural Experiment Station, Camp Hill.

Manuscript received September 1, 1973.

Design and Method

Systems Evaluated

Winter Cow-calf

This system was designed to utilize annual winter grazing as the primary source of nutrients for a fall calving operation. Annual winter grazing consisted of wheat (*Triticum aestivum*), oats (*Avena sativa*), and annual ryegrass (*Lolium multiflorum*). Permanent pasture consisted of common bermuda (*Cynodon dactylon*), coastal bermuda (*Cynodon dactylon*), and serecia lespedeza (*Lespedeza cuneta*). Brood cows were allowed 1.5 acres of permanent pasture and 0.5 acre of annual winter grazing per head plus additional woodland to range over. Woodland consisted of pine, oak, sweet gum, and hickory, which actually produced little cattle feed but provided weather protection for cattle. An average of 3,121 lb bermuda hay per cow was fed free choice per year and 1 lb cotton seed meal pellets was fed per cow per week during the winter period. The brood cow herd on the average consisted of 72 cows and 8 replacement heifers.

Replacement heifers for the winter cow-calf herd were purchased at weaning age because, with the inclusion of winter grazing in the system design, they could be grown to breeding age with the brood cows. Annual winter grazing is a good quality forage for growing replacement heifers.

The cows and replacement heifers were bred in December, January, and February to calve in September, October, and November. The calves were marketed to the summer stocker test unit when weaned at the termination of the winter grazing season in May and June. The cows and replacement heifers were pregnancy tested in July and the nonbreeders and other cull cows and heifers were sold.

Summer Cow-calf

This system was designed to utilize spring and summer permanent pasture as the primary source of nutrients for a spring calving operation. Permanent pasture consisted of

common bermuda, coastal bermuda, and tall fescue (*Festuca arundinacea*) pasture plus additional woodland to range over. Brood cows were allowed 2.5 acres of permanent pasture per head. An average of 2,831 lb bermuda hay per cow was fed free choice per year and 121 lb cotton seed meal pellets was fed per cow annually for the first 3 years of test. No pellets were fed during the last year of test. The quality and quantity of forage during the final year obviated the feeding of cotton seed meal pellets. An average of 75 cows were bred during May, June, and July to calve during February, March, and April during the four test years. Replacement heifers averaging near 765 pounds were purchased during May and June of each year for breeding. Cows and heifers were pregnancy tested during October and the nonbreeders and other culls were sold. The calves were weaned and most were sold to the winter stocker test unit during November.

Winter Stocker System

This system was designed to utilize annual winter grazing as the primary source of nutrients for growing stocker calves. Starting dates on winter grazing varied from October 30 to December 6, and the stockers were marketed at the termination of the grazing season, which varied from May 7 to June 1. The stocking rate was usually determined by the estimated carrying capacity of the fall accumulation of forage and the past experience of the operators with winter grazing. The average number on test was 61 with an average stocking rate of 1.3 calves per acre. Mixed fescue and bermuda hay was available at all times in hay racks.

Summer Stocker System

The treatment of calves in the summer stocker unit varied considerably over the test period in an effort to find a profitable production method. Stockers were purchased from other sources during the first 3 years of tests and from the winter cow-calf herd during the last 3 years of tests. A decision was made to purchase calves in June rather than April and harvest hay before starting calves during the last 2 years of test because the earlier weaning dates were penalizing the winter cow-calf unit. The peak forage production period for both the winter cow-calf system and the summer stocker calf system was from April 15 to June 15; therefore, early weaning penalized the cow-calf system and late weaning penalized the stocker calf system. It was judged most practical to use the late weaning date. The average number on test was 55, with a stocking rate of 1.1 calves per acre. Calves were usually marketed in September.

Pasture Management

Annual Winter Pasture

The land was usually prepared by harrowing three or four times during July and August, depending on the amount of rainfall. Planting dates varied from the first week to the last week in September. Small grain was planted with a grain drill, and the annual ryegrass was seeded and packed by a cultipacker. Seeding rates per acre were usually 1 bushel wheat, 3 bushels oats, and 18 lb annual ryegrass seed. Approximately 500 lb 5-10-15 fertilizer was used at planting, and 100 lb/acre of available nitrogen was applied as top dressing in split applications in October and November. Establishment cost for annual winter grazing was about $35 per acre.

Summer Permanent Pasture

Usually 500 lb/acre of a 0-10-20 analysis fertilizer was applied every other year. Approximately 50 lb/acre of available nitrogen top dressing was applied per year to pastures used only for grazing. Nearly 80 lb of available nitrogen top dressing was applied to common bermuda and coastal bermuda pastures used for grazing and hay harvest.

Test Results

Detailed records were maintained of expenses, receipts, and cattle performance for each system. Cows and heifers were valued according to current market prices at the beginning and end of each year to estimate the value of the cattle inventory. Changes in the value of inventory were due to growth of heifers, death losses, and increases in general cattle price levels. Prices of 300-to 550-lb feeder calves varied from $15.38 per hundredweight in October of 1964 to $35.90 in April of 1970. Surplus forage was harvested from each unit, and the value of the hay over the cost of harvesting was added to the total revenue of each unit as a pasture credit.

Cow-Calf Systems

Calves were marketed from approximately 97% of the bred cows, and heifers maintained in both the winter and summer herds after pregnancy testing and culling (Table 1). An average of 19% or 13.5 head of brood cows in the winter system and 20% or 15 head in the summer system was culled each year in order to market this high percentage of calves. The average weaning weights were 428 lb/calf at 229 days of age for the winter system and 420 lb/calf at 231 days of age for the summer system. Weaned weights per acre of pasture land were 205 lb for the winter and 166 lb for the summer system.

Table 1. Brood cow-calf tests, average production results, Georgia Piedmont, 1966-70.

Item	Unit	Winter cow-calf	Summer cow-calf
Bred cows and heifers	no.	71.00	75.60
Open replacement heifers	no.	7.80	–
Death loss–cows	no.	2.00	1.00
Death loss–calves	no.	1.00	–
Number calves sold	no.	70.00	73.00
Average selling weight	lb	428.00	420.00
Receipts[a]	$	13,065.00	11,295.00
Expense[b]	$	10,181.59	9,283.51
Total returns[c]	$	2,883.41	2,012.49
Returns per cow[c]	$	36.13	26.61
Returns per acre[c]	$	18.37	10.87

[a]Receipts include calf sales, cull cattle sales, pasture credits, and inventory increase.
[b]Expenses include cattle purchase, fertilizer, seed, feed, labor, equipment, and miscellaneous.
[c]Returns to capital, land, and management.
Source: Cow-calf production tests, Central Georgia Branch Experiment Station, Eatonton.

Returns to capital, land, and management for the winter cow-calf system averaged $36.13 per brood cow or $18.37 per acre of pasture land. Returns to capital, land, and management for the summer cow-calf system averaged $26.61 per brood cow or $10.87 per acre of pasture land (Table 1).

Stocker Calf Systems

Winter Stocker System

The average weight gain per acre varied from 277 lb in 1966-67 to 428 lb in 1968-69 and averaged 352 lb over the entire period. The average weight gain per calf was 251 lb. Average number of days on grazing was 180 with an average

Table 2. Average production results, stocker calf grazing tests, Georgia Piedmont area, 1963-70.

	Unit	Annual winter grazing	Summer permanent pasture
Stockers	no.	61.00	55.00
Average purchase weight	lb	411.00	454.00
Average market weight	lb	662.10	568.00
Gain per calf	lb	251.10	114.00
Gain per acre	lb	352.00	125.00
Purchase price	$/cwt.	23.08	24.00
Selling price	$/cwt.	24.11	20.94
Pasture and feed cost	$/cwt.	14.23	3.59
Total production cost[a]	$/cwt.	19.74	19.90
Returns per calf[b]	$	29.00	5.88
Returns per acre[b]	$	41.00	6.46

[a]Production costs include stocker calf, pasture, feed, machinery, and labor. Capital, land, and management costs are not included.
[b]Returns to capital, land, and management.
Source: Weaned stocker calf production tests, Central Georgia Branch Experiment Station, Eatonton.

daily gain per calf of 1.44 lb. Production costs including stocker calf purchase, pasture, feed, machinery, and labor averaged $19.74 per hundredweight. Returns to capital, land, and management averaged $29.00 per calf and $41.00 per acre (Table 2).

Summer Stocker System

Average annual calf weight gains per acre ranged from 53 lb in 1968-69 to 221 lb in 1963-64, averaging 125 lb over the entire period. The average gain per calf was 114 lb. Production cost including stocker calf purchase, pasture, feed, machinery, and labor averaged $19.90 per hundredweight. Returns to capital, land, and management averaged $5.88/calf and $6.46/acre (Table 2).

Evaluation and Discussion

Cow-Calf Systems

Average receipts were greater for the winter system than for the summer system, due primarily to additional pasture credits from harvesting hay and a seasonal price advantage for marketing calves in June rather than in November. Feed costs were about the same for the two systems. The main difference in production cost was the additional expense in the winter system of establishing the annual winter grazing.

Stocker Systems

The winter stocker system had several important advantages over the summer stocker system. The winter grazing system was better adapted to stocker calf production than the summer system, due probably to the fact that tender annual winter grazing is more digestible by younger animals than coarse summer forage. Average gains were almost three times greater for the winter system than the summer system. The winter system also had a seasonal marketing advantage because calves were purchased in a lower price season and marketed in a higher price season. The opposite was true for the summer system which had a seasonal market price disadvantage. The highlight of the summer stocker system was the low pasture and feed costs of $3.59/100 lb of gain. This indicated the possibility of incorporating the summer feeder calf phase into an extended grazing or feeding system. Pasture and feed costs were reduced by harvesting surplus grass for hay.

Cow-Calf and Stocker Combinations

Each system was analyzed separately to study costs and returns, and then a combination of systems was examined to see if they could be combined economically. The summer cow-calf and the winter stocker systems offered the best combination of systems compared and yielded the greatest return. This combination offered cow-calf operators a good alternative for additional weight gains for their calves and a method to advance their cattle to a more favorable marketing period.

The winter cow-calf and the summer stocker systems did not work as well. The cow-calf system was penalized when calves were weaned in April or May and the stocker system was penalized when calves were weaned later in June. Summer gains were low and fall market prices were not as favorable as spring market prices.

Summary and Conclusions

The primary objectives of the tests were: 1) to evaluate the economics of each system, and 2) compare cow-calf and stocker-calf production systems based on winter grazing as the primary source of nutrients to systems based on summer grazing as the primary source of nutrients.

Average weaning weights for the two cow-calf systems were nearly equal, with 428 lb/calf for the winter system and 420 lb/calf for the summer system. Estimated returns to capital, land, and management per acre of pasture land for the 1966-70 period were $18.37 for the winter system and $10.87 for the summer system.

Average weight gains per calf were 251 lb for the winter stocker systems and 114 lb for the summer stocker system. Estimated returns to capital, land, and management were $41.00 per acre (1963-70 period) for the winter stocker system and $6.46 per acre (1963-69 period) for the summer stocker system.

The tests show that returns to cow-calf systems were low relative to capital and land requirements. Returns were increased very little by transferring weaned calves from the winter cow-calf system to the summer stocker system. This was due in part to the inability of young cattle to utilize summer forage and unfavorable price margins between spring and fall cattle markets. Returns were increased significantly by transferring weaned calves from the summer cow-calf system to the winter stocker system. Stocker calves were able to utilize annual winter grazing well and cattle price margins were favorable. The summer cow-calf system and the winter stocker systems were the best combination of systems to increase total cattle production for the Piedmont area.

Literature Cited

Allison, John R. 1970. Profitability of cow-calf operations in Georgia. Univ. of Georgia College of Agr. Exp. Sta. Res. Rep. 83.

Goodwin, J. D. 1965. Optimum Distribution Patterns of Feeder Cattle from the Southeast. Louisiana Agr. Sta. Bull. 101, Southern Cooperative Series.