Kansas Agricultural Experiment Station Research Reports

Volume 0
Issue 1 *Cattleman's Day (1993-2014)*

Article 346

2002

Economies of scale in Kansas beef cow-calf production (2002)

L. Stryker

Michael R. Langemeier

R. Jones

Recommended Citation

Stryker, L.; Langemeier, Michael R.; and Jones, R. (2002) "Economies of scale in Kansas beef cow-calf production (2002)," *Kansas Agricultural Experiment Station Research Reports*: Vol. 0: Iss. 1.
https://doi.org/10.4148/2378-5977.1749

ECONOMIES OF SCALE IN KANSAS BEEF COW-CALF PRODUCTION

L. Stryker[1], M. Langemeier[1], and R. Jones[1]

Summary

Cow-calf producers must learn to control those aspects of production that are under their management. Quantity of beef produced and the cost of maintaining the breeding herd from conception to weaning are two examples of variables over which an individual operator has control. Therefore, it is important for managers to know their cost of production and, in turn, the relationship of quantity produced to cost. Our study found that for a 1% increase in quantity of beef produced, total cost increased by only 0.88%, suggesting economies of scale.

(Key Words: Cow-Calf, Total Cost, Economies of Scale.)

Introduction

There has been a trend in the beef cattle industry to associate larger operations with least-cost production. While farms becoming larger does not guarantee decreased average cost of production, it is important for operators to know the optimal size for their operation. Quantity of beef produced and the cost incurred in the production of that beef are two variables over which managers have substantial control. That is why it is important for producers to know their costs of production, and how changes in farm structure (size) would affect them.

Our objective was to evaluate the relationship between total cost of production and pounds produced for beef cow-calf producers in Kansas. Findings should be helpful in the development of long-term herd management goals.

Experimental Procedures

Total cost data from the Kansas Farm Management Association database were utilized for the analysis. The data consisted of an average of five years (1995-1999) of total cost for 97 different cow-calf enterprises in Kansas, as well as corresponding quantities of beef produced. Output consisted of the total pounds of beef produced, including weaned calves and culled breeding stock. Table 1 presents summary statistics on output and average cost of production for the sample. Producers' output ranged from 14,193 to 220,001 pounds of beef. Input cost included labor, feed, capital, fuel and utilities, veterinary expenses, miscellaneous, and opportunity cost. Cost items were adjusted using the implicit-price deflator for personal consumption expenditures to account for inflation. Cost items were then summed to arrive at total cost.

Regression analysis was used to estimate the relationship between total cost and output. Estimated cost resulting from the regression coefficients was plotted against output to detect economies of scale.

[1]Department of Agricultural Economics

Results and Discussion

The regression resulted in an R^2 of 0.915, indicating a strong relationship between pounds produced and total cost. Regression results demonstrate that, on average, total cost increased by 0.88% for each 1% increase in quantity produced: output increased at a greater rate than total cost, signifying the existence of economies of scale.

Figure 1 reveals that average cost decreases while quantity of beef produced increases, which also indicates the existence of economies of scale. As pounds of beef produced per year increased from 10,000 to 60,000 lbs, estimated average cost per lb declined from $1.12 to $0.91, illustrating the cost advantages of increasing the quantity produced in these relatively small herds. These operations may have cost synergies associated with producing beef and crops that we did not capture in our study. They might also have capital or labor constraints that prevent them from capitalizing on the economic benefits of increased quantity of production. Average cost begins to level out after 60,000 pounds of beef produced, but there is still a slight decrease in average cost for higher output levels.

The opportunities for capitalizing on economies of scale are apparently more pronounced for smaller operations. Producers, especially very small producers, can use these results to judge whether they are fully utilizing their resources. Cow-calf managers considering herd expansion should first carefully evaluate their individual cost of production, and then, perhaps, incorporate these results into the decision process.

Table 1. Summary Statistics for a Sample of Kansas Beef Cow-Calf Farms (1995-1999)

Variable	Average	Minimum	Maximum	Standard Deviation
Number of cows (hd)	122.38	26	491	245.42
Total cost ($)	62,744	11,436	168,978	36982
Pounds beef produced	71,182	14,193	220,001	45320
Average costs ($/lb)	0.9284	0.6033	1.7913	0.1957

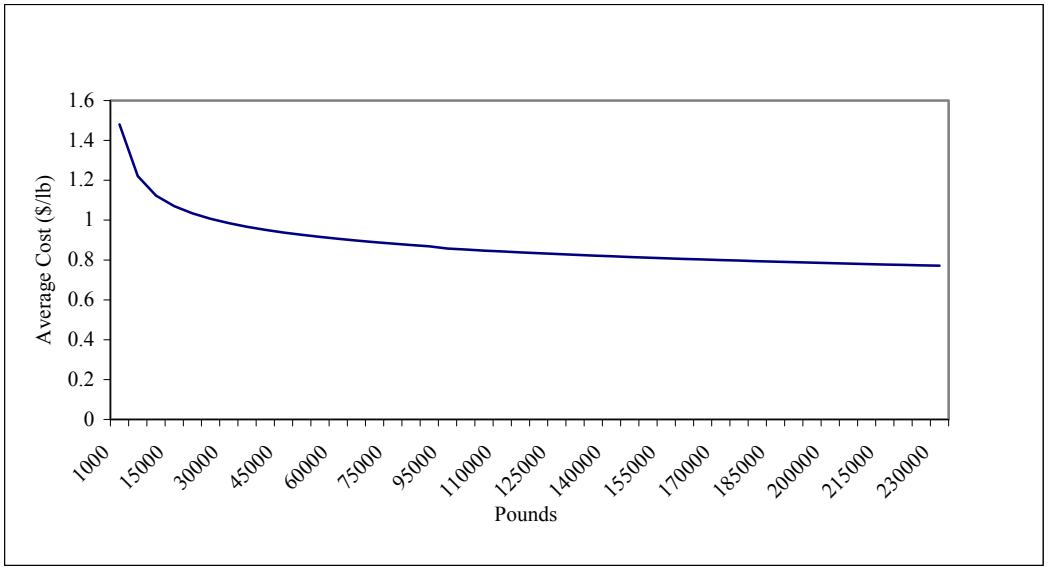

Figure 1. Average Cost Curve for a Sample of Kansas Cow Producers 1995-1999.