THE ECONOMICS OF CARCASS BEEF PRODUCTION: AN APPRAISAL OF FLORIDA'S FEEDLOT POTENTIAL

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The production of beef cattle has historically been an important component of the Southeast's[1] agricultural economy. In 1977 the region had 24.6 million cattle and calves, accounting for more than 28 percent of the total mature beef animals in the United States [3]. Despite this large and active cattle industry, however, the region is substantially deficient in carcass beef production.

Two basic reasons can be cited as responsible for this situation. First, the Southeast has many areas of urban concentration contributing to a large population. Enormous amounts of carcass beef therefore are required to satisfy human consumption demands. Second, though an abundance of pasture forage, hay, and silage provides an attractive setting for beef producers specializing in cow-calf beef enterprises, the region produces limited quantities of feed grains. As a result, most of the region's beef production is marketed in the form of feeder calves to finishing operations in the Southwest and Midwest. In fact, in 1977 less than 2 percent of the region's cattle and calves were on feed within the region [3].

In response to these conditions of regional carcass beef deficiency, large amounts of carcass beef are imported into the region from carcass beef surplus areas of the United States. Furthermore, these conditions are not expected to improve in the future. For instance, in 1971 the region's 44.6 million inhabitants consumed an estimated 5,218.5 million pounds of beef. By the year 2000, consumption is projected to almost double—to more than 9,271 million pounds [9, 10].

Of all the Southeastern states, Florida faces the most severe carcass beef problems. Florida has the largest and fastest growing population of any Southeastern state, as well as the largest number of mature beef animals. By 2000, Florida's projected 12.7 million people will make the state almost twice as populous as the next closest Southeastern state, with a carcass beef demand of almost 2 billion pounds (9, 10). On the basis of current production, with only 73,000 animals on feed of the 2.8 million total cattle and calves in the state [3], less than 30 percent of Florida's beef requirements could be met from within the state [4, p. 2].

Because of this strong and growing demand, the availability of feeder calves, and rising transportation costs associated with shipping carcass beef into the region, many Southeastern beef producers, including many in Florida, have expressed a growing interest in finishing their own feeder calves. Because Florida most clearly demonstrates many of the carcass beef problems and potentials of the region, a study was undertaken to analyze the economic factors involved in finishing feeder calves in a hypothetical Florida feedlot. The implications for a feeding industry of many such feedlots were examined for Florida's particular situation. To the degree that Florida's problems (although more exaggerated) are representative of the region's problems, insight thus can be gained into the economics of beef finishing in the Southeast.

PROCEDURE

In the analysis of the carcass beef production potential in Florida (or the Southeast), two questions require consideration. First, could a representative feedlot, facing the same relative feed and cattle prices as have been observed historically in the cattle finishing industry, generate sufficient returns to warrant its establishment and continued operation? Second, if this feedlot were feasible, what are the implications for the feasibility of an industry of such feedlots of sufficient magnitude to finish all of the feeder calves available within the state?

To address the first question, a representative 10,000-head feedlot in central Florida was hypothesized. This size is representative of

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[1]Southeastern states include Alabama, Arkansas, Florida, Georgia, Kentucky, Louisiana, Mississippi, North Carolina, South Carolina, Tennessee, Virginia, and West Virginia.

many feedlots in the Southwest, and of the estimated 73,000 animals on feed in Florida most are in a few feedlots of 10,000 head or more which are primarily components of vertically integrated operations. The costs associated with establishing such a facility apart from a vertically integrated operation, as well as many of the other necessary prices and costs, were calculated by Jordan [4]. The prices of major feed grains, processed byproducts, feed additives, and protein meals were calculated for the major market nearest to Florida for each year of the 1968-1976 period. Transportation costs from that market to Florida were added [1]. For the same period, the prices of Florida-produced feedstuffs (citrus pulp, citrus molasses, bagasse pellets, and bahia and bermuda grass hay), feeder and slaughter calves, labor, and other factors were calculated.

Because most feeder calves shipped out of Florida are weaned 300-500 pound animals and are generally considered to be too light for intensive feeding, a two-stage feeding program was utilized. For the first stage, or "backgrounding," animals entering the program were assumed to weigh 300 pounds and to be purchased at prevailing prices in Florida auctions during the 1968-1976 period. The animals then were fed a ration which allowed an averaged daily gain of 1.67 pounds for approximately 210 days in the backgrounding program. At the conclusion of the backgrounding program the animals weighed 650 pounds and were transferred to a finishing ration. In this stage, animals were fed a ration which allowed an average gain of 2.25 pounds per day for approximately 182 days. Thus, it was assumed that after a total of approximately 13 months (392 days) in the feedlot,[2] an animal weighing 1050 pounds are produced for slaughter. Such an animal generally would grade low choice to high good, and thus meet the grade requirements generally associated with retail sales of beef.

Williams and Farris [11] have argued that in grain-deficit regions economic benefits are possible with short-fed heifers and lower quality steers in relation to a feeding program such as described here. This point is undoubtedly true if the output of a single producer is negligible in relation to market quantities and prices can be assumed fixed. There is reason to believe, however, that the demand for less than choice beef becomes progressively more inelastic as quality falls—as evidenced by the fact that 70 to 80 percent of fed cattle grade choice. Thus prices for other than choice beef may not be fixed even for a firm in relatively isolated markets. Because the exact nature of the alternative (quality-determined) demand curves is unknown, this study is limited to a system for the production of choice beef under fixed market prices. Nutrient requirements for both the finishing and backgrounding programs of this system are summarized in Table 1.

In accordance with the classical theory of the firm, the representative feedlot was assumed to pay fixed prices (factor and product) each year. Least-cost diets were calculated for each of the two feeding programs, under each annual set of fixed relative prices, by use of linear programming. All feedstuffs and their nutrient content were considered on a dry matter basis. Two activities were specified for each feedstuff to differentiate between feed utilized for maintenance and feed utilized for gain [5, 8]. Feeding values were then determined on NRC [7] net energy values for these two alternative uses of a feedstuff.

The combined length of the two feeding programs implied that animals purchased in a given year would not be finished until the following year. Thus, net revenue per head in year t was calculated as

$$(1)\quad \text{net revenue head}_t = (\text{slaughter price}^3)_{t+1} \times (1050 \text{ pounds}) - (\text{weaned price})_t \times (300 \text{ pounds}) - \sum_i(\text{price of i}^{th} \text{ feedstuff})_t \times (\text{quantity of i}^{th} \text{ feedstuff})_t - (\text{other variable costs}^4)_t - (\text{fixed costs}^5)_t) - (\text{death loss})_t$$

where

$$(\text{death loss})_t = .015[\text{slaughter price})_t \times (1050 \text{ pounds}) - .5(\text{feed costs} + \text{other variable costs})_t]$$

and all other variables are as previously described. If two weeks were allowed for clean-

[2]Most light calves are grazed on some type of pasture until reaching on acceptable feedlot weight rather than being backgrounded in the feedlot. In this analysis, however, it is assumed that the individual feedlot would do the backgrounding to ensure animal availability.

[3]On the average, 70 percent of the animals finished were assumed to be grade USDA choice and 30 percent USDA good, and slaughter prices were weighted accordingly.

[4]Jordan calculated a base estimate of $39.15 per head per year for other variable costs in 1973. This estimate was increased proportionally to reflect the longer feeding period and then adjusted annually by using the Wholesale Price Index to estimate other variable costs for 1968-1976. Other variable costs include labor, veterinary costs, interest on feed purchase, and miscellaneous expenses.

[5]It was assumed that a downpayment of 20 percent was made on the facility and a 15-year loan was obtained at 7 percent interest to finance the difference. Fixed costs include interest on facility, taxes, insurance, depreciation, and miscellaneous repairs.

ing pens, acquiring new animals, etc., the assumed 10,000-head capacity feedlot would be able to produce approximately 8930 animals per year, for an annual turnover rate of .893.

At an industry level, Florida's large projected population and beef consumption indicate continued excess carcass beef demands in relation to local supplies through the year 2000—even if all feeder calves produced in the state were finished locally. Furthermore, it is reasonable to assume that a Florida feedlot industry of sufficient size to finish all locally produced feeder calves would not greatly alter national markets (so that feeds and beef acquired outside of Florida could continue to be purchased at the given market price). The fixed prices for locally produced feeds and feeder calves paid by the individual feedlot, however, would not be appropriate for the industry. Instead, industry prices would be determined by supply and demand conditions in competitive markets.

Under such conditions, industry returns obviously would be affected by the supplies of locally produced feeder calves and feeds as well as by the market prices of feeds and beef acquired outside Florida. Clearly, all alternative combinations of these effects cannot be addressed within the limited context of this study. Therefore, limited supplies of locally produced feeder calves and feedstuffs are treated as the major factors affecting the development of a Florida feedlot industry.

Cattle and feed prices were assumed to be fixed at the average of the annual prices previously calculated. The analysis originally performed for the representative feedlot then was modified to reflect the limited availability of feeder calves and Florida-produced feedstuffs at an aggregate, or industry, level. For instance, from the most recent data available it was estimated that Florida would have available 770,000 feeder calves, 858,577 tons of citrus pulp, 33,156 tons of citrus molasses, and 221,000 tons of bagasse pellets[6] [2, 3]. With the assumption that no drastic production changes would occur to change the supply of these factors (especially as these feeds are byproducts of other industries), the values thus obtained were used to define resource constraints for the industry least-cost diets and subsequent analysis.

Furthermore, though the individual feedlot was assumed to conduct its own backgrounding program the establishment of a large-scale feedlot industry was assumed to cause an increased demand for 600-700 pound feeders. As a result, backgrounding would be undertaken by producers outside the feedlot industry

TABLE 1. NUTRIENT REQUIREMENTS PER HEAD[a]

Nutrient	Backgrounding 1.67 lbs. daily gain 210 days		Finishing 2.25 lbs. daily gain 182 days	
	Basis		Basis	
	Min.	Max.	Min.	Max.
Dry matter intake	1745.0 lbs.	2741.96 lbs.	3094.0 lbs.	4254.0 lbs.
Net energy maintenance	909.3 Mcal.	909.3 Mcal.	1219.4 Mcal.	1219.4 Mcal.
Net energy gain	508.164 Mcal.	508.164 Mcal.	942.76 Mcal.	942.76 Mcal.
Digestible protein	161.7 lbs.		216.58 lbs.	
Calcium	6.48 lbs.		8.4226 lbs.	
Phosphorous	6.01895 lbs.		8.0262 lbs.	
Vitamin A	2,730,162.5 IU		3,458,000.0 IU	
Roughage	119.91793 lbs.		450.50 lbs.	
Molasses		219.463 lbs.		340.34 lbs.
Non-protein nitrogen		29.8178 lbs.		64.0 lbs.

[a]Source: NRC [7].

TABLE 2. DOLLARS OF NET REVENUE PER HEAD FOR A REPRESENTATIVE FEEDLOT[a]

Year of purchase (t)	1	2	3	4	5	6	7	8	Avg.
Gross margin	227.41	211.76	224.55	278.99	324.07	162.71	229.69	269.41	241.07
Fixed cost	23.75	23.63	23.42	23.27	23.68	24.03	24.87	25.17	23.98
Other variable costs	33.28	34.60	35.86	37.00	38.66	43.85	52.11	56.93	41.54
Feed cost[b]	112.38	84.42	114.82	121.85	119.66	160.63	207.55	208.82	141.27
Death loss	3.57	3.75	3.90	4.69	5.86	3.49	2.94	3.10	3.91
Total cost	172.98	146.40	178.00	186.81	187.86	232.00	287.47	294.02	210.70
Net revenue	54.43	65.36	46.55	92.18	136.21	-69.29	-57.78	-24.61	30.37

[a]Calculated as described in equation (1).

[b]Calculated from the least-cost rations obtained from annual solutions of the linear programming model.

[6]Feeds are as of the 1975-1976 growing season, and feeder cattle are the projected supply based on 1.4 million mature animals in 1976 with an estimated calf crop of 80 percent and a 25 percent cow replacement rate.

itself. Hence, in the industry analysis only the finishing program was considered. Bahia and bermuda grass hay were also removed from the industry model to ensure adequate availability of these feeds for the backgrounding and cow-calf enterprises.

RESULTS

Letting t= 1 denote the year in which prices correspond to historical 1968 prices, t=2 correspond to 1969 prices, etc., costs and returns per animal were obtained for the representative feedlot as shown in Table 2. On the average, these results indicate that the feedlot could expect a positive net revenue of $30.37 per animal, or approximately $.04 per pound of live-weight gain. On this basis, therefore, one might conclude that the hypothesized representative feedlot could generate sufficient revenue to be feasible in Florida.

As significant as the average net revenue per animal, however, is the variability of that revenue. The results indicate that a large variation in gross margin (resulting from changes in relative cattle prices), coupled primarily with variable feed cost, causes a wide range of possible net revenues over the 8-year period. If net returns are assumed to be normally distributed, the standard error of net revenue per animal over the 8-year period considered is $73.50, or almost 2½ times the mean. Thus, one can be 95 percent certain only that this representative feedlot's annual net revenue per animal will fall between a profit of $177.37 and a loss of $116.63.

In this context, there is a clear potential to both make and lose a large amount of money in cattle feeding. With the possible exception of a very strong (financially) operation, however, a feedlot probably could not withstand more than a brief period of losses in the range of $100 per animal. Hence, the feasibility of this representative feedlot depends finally on questions of risk.

The manner in which any individual producer views risk, and his ability to avoid or withstand potentially severe losses, will govern the establishment and continuation of the representative feedlot. For illustration, assume a producer requires a rate of return on his investment in a feedlot of

$$r = i + e + \pi$$

where i is the interest rate, e is a required entrepreneurial rate of return[7] and π is the required rate of return associated with the producer's perception of risk in cattle feeding. In this representation, if π is zero the producer might be classified as risk neutral, whereas he is risk averse or risk accepting for π values greater than or less than zero, respectively.

For a 10-year planning horizon, the producer's decision about feedlot investment is dependent on the value of the function

$$NPV = -I_0 + \sum_{t=1}^{10} \frac{ER_t}{(1+r)^t} + \frac{S_{10}}{(1+r)}10$$

where NPV is the net present value of expected future returns, I_0 is the initial investment, ER_t is the expected returns in time period t, and S_{10} is the salvage value in year 10. If NPV is negative, the producer is not expected to invest in the feedlot, whereas for positive NPV he might be expected to invest. At NPV equal to zero he is indifferent with respect to the cattle feeding investment.

For the previously described representative feedlot, I_0 is the cost of the facility, estimated by Jordan [4, p. 51] to be $1,186,850.00, plus an operating capital requirement. If the initial operating capital requirement is equal to one year's average cost (from Table 1) plus the purchase cost of feeder calves multiplied by 8930 head, I_0 is approximately $4 million. ER_t is assumed to be average net revenue per head ($30.37) times 8930 head per year, and S_{10} is assumed to be equal to the initial operating capital requirement plus 50 percent of the initial facility cost when the facility is assumed to have a 20-year life [4, p. 51].

Because interest costs are already reflected in the computation of ER_t, double-counting is avoided by setting i=0. By then assuming that the required entrepreneurial rate of return is 5 percent, one can solve for NPV under alternative required rates of return associated with risk as summarized in Table 3.

TABLE 3. SUMMARY OF THE RISK INVESTMENT DECISION IN CATTLE FEEDING UNDER ALTERNATIVE REQUIRED RATES OF RETURN

Risk rate of return (π)	Total required rate of return (r)	Net present value (NPV)[a]	Investment decision
-.05	0	2,118,615	Yes
-.02	.03	848,223	Yes
0	.05	185,486	Yes
.02	.07	-363,439	No
.05	.10	-1,020,189	No
.10	.15	-2,220,247	No

[a]Rounded to even dollars.

[7]The entrepreneurial rate of return as used here might also be characterized as a rate of return to management—especially in an owner-operator management system.

These results clearly indicate that a risk accepting ($\pi = -.05$ and $\pi = -.02$) or risk neutral ($\pi = 0$) individual might undertake to invest in cattle feeding, but an individual only slightly risk averse ($\pi = .02$) would not. It must be stressed, however, that the perception of risk and its associated required rate of return varies from one producer to another; this analysis is only illustrative. Alternative values of I_o, S_{10}, i, and e can greatly change these results, as can other factors such as inflation that were not considered. Such a detailed analysis, including alternative methods of risk analysis, are beyond the scope of this study.

Under such risky conditions as have been described, the selection of an appropriate ration is critical. The averages of the least-cost rations computed each year for the representative feedlot are summarized in Table 4 for backgrounding, finishing, and total feeding programs.

TABLE 4. TOTAL AVERAGE RATION DRY MATTER AND COMPOSITION OF THE TOTAL RATION.

Feedstuffs	Backgrounding		Finishing		Total	
	Tons	%	Tons	%	Tons	%
Local						
Coastal bermuda hay	.356	35.32	.376	23.51	.732	28.07
Bagasse pellets	.006	.62	.035	2.17	.041	1.57
Citrus pulp	.397	39.42	.843	52.70	1.241	47.57
Alfalfa 17% pellets	.041	4.02	.062	3.89	.103	3.94
Citrus molasses	.096	9.51	.147	9.19	.243	9.31
Dical	.008	.74	.010	.62	.017	.67
Trace minerals	.004	.43	.020	1.23	.024	.92
Imported						
Cotton seed meal	.003	.29			.003	.11
Hominy	.044	4.35	.056	3.52	.100	3.85
Brewer's grain	.050	4.94	.023	1.45	.073	2.80
Cotton seed hulls			.026	1.62	.026	.99
Meat & bone meal	.004	.36			.004	.14
Tankage			.002	.10	.002	.06
Total[a]	1.008	100.0	1.600	100.0	2.608	100.0
Percent of ration locally available	90.06		93.30		92.05	

[a]Column totals may not sum due to rounding differences.

The backgrounding diets typically contained a substantially higher portion of roughages, primarily coastal bermuda hay, than concentrates. Concentrates that were fed in the backgrounding ration were primarily citrus molasses and citrus pulp, although in some years it was optimal to import moderate amounts of brewer's grain and hominy. At no time, however, was it optimal to import the common feed concentrates such as corn and sorghum grain for background feeding in Florida.

The least-cost finishing diets were similarly composed primarily of citrus pulp, citrus molasses, and coastal bermuda hay. In these diets, however, the hay was a much smaller portion of the total diet than in the backgrounding program.

As in the backgrounding program, the least-cost finishing ration never included imported corn or sorghum grain. Furthermore, the penalty costs (obtained from the linear programming solution) of these common feed concentrates ranged from \$5.89 to \$32.55 per ton and from \$42.89 to \$63.62 per ton for corn grain and sorghum grain, respectively. Because these penalty costs represent the amount by which the ration cost would increase if one unit (in this case, ton) of corn grain or sorghum grain, respectively, were used in the diet, it is obvious that importation and use of these common concentrates would substantially increase feed costs.

On the basis of these findings, the least-cost rations for both the backgrounding and finishing programs can be categorized as (1) predominantly composed of Florida-produced, or locally available, feedstuffs and (2) generally higher in roughage proportions, especially in the backgrounding program, than a typical Midwestern or Southwestern region. Furthermore, there is some evidence, such as the penalty costs, to support a conclusion that Florida producers must use locally grown feedstuffs to minimize feeding costs. Failure to do so can substantially increase ration costs. Though these diet results are applicable at a firm level, it would be grossly inappropriate to attempt to apply them at an aggregate, industry level. Specifically, the quantities of locally produced feedstuffs are not likely to be sufficient to support large-scale industry utilization of these rations at the assumed fixed prices at any time in the near future.

To illustrate this point, the least-cost linear programming model was modified as previously described to reflect an industry finishing 770,000 head annually. With 8-year average prices, least-cost diets were then obtained for these animals under each of two hypothesized feed availability situations. First, locally produced feeds were limited to their 1976 total production in tons of dry matter. Second, the level of locally produced feeds was reduced to reflect exogenous, or export, demands in 1976 [2]. In both situations it was assumed that imported feeds would continue to be available at the fixed price. The relevant feed constraints and resulting least-cost rations are summarized on a per-animal basis in Table 5.

TABLE 5. FEED AVAILABILITY AND OPTIMAL PER ANIMAL RATIONS FOR A FLORIDA FEEDLOT INDUSTRY

Feedstuffs	Total local feed produced available		Feed production less exports available	
	Constraint[a]	Ration[b]	Constraint[a]	Ration[b]
Local				
Citrus pulp	777,000.0	1.0	401,400.0	.521298
Citrus molasses	21,500.0	.027922	11,270.0	.014636
Bagasse pellets[c]	221,000.0	.287012	221,000.0	.287012
Dical		.007555		.003179
Cane molasses				.141183
Imported				
Corn gluten feed		.002015		
Brewer's grain		.21259		.29086
Cotton seed hulls		.009903		.150064
Hominy				.138764
Total		1.546997		1.54996
Percent of ration locally available		85.49		62.41

[a]Total tons dry matter available to the industry.

[b]Tons dry matter per animal in the least-cost ration.

[c]No records of bagasse pellet export were available and exports were therefore assumed to be zero.

Like the least-cost finishing rations obtained for the representative feedlot, these rations are composed primarily of locally available feedstuffs. As would be expected, however, as the supply of local feeds was exhausted the proportion of the ration imported was increased. This pattern is most evident in the case in which local production was reduced by exports, or exogenous demands, and hence more than 37 percent of the ration was imported feedstuffs.

Given these rations, costs and returns per animal in this industry were calculated as previously described with only minor modifications. First, costs associated with backgrounding were excluded. Second, gross margins were adjusted to reflect the cost, based on 8-year average price, of acquiring a 650 pound feeder instead of a 300 pound calf. Third, at the assumed 2.25 daily rate of gain in the finishing program, an annual turnover rate of 2.0 was obtained and the fixed costs were proportioned accordingly. Fourth, feed costs were calculated by using the shadow prices of the constrained, locally produced feeds to reflect the price changes for these feeds that might occur in response to the excess demands of the hypothesized feedlot industry. The values thus calculated are summarized in Table 6.

Clearly, the revenue per animal for the industry is significantly different from the average revenue of $30.37 obtained for the representative feedlot. A portion of this difference is obviously due to exclusion of the backgrounding program at the industry level, but a more relevant cause is the substantial change in ration cost.

At the industry level, increased demands on local feeds would cause their prices to increase. Furthermore, as the local supply is exhausted, the industry must import higher priced feeds such as hominy and brewer's grain to satisfy its feed needs. Feed costs are increased and the ability of the industry to compete effectively is reduced. Hence, the ration cost to finish an animal at the industry level is approximately 70 percent of the representative feedlot's feed cost for both backgrounding and finishing.

The relatively low per animal revenue, ranging from $2.04 profit to $8.04 loss, is clearly a reason for skepticism about the establishment of an industry of sufficient scale to finish all of the calves potentially available. If this average return is coupled with the type of variability in returns observed for the representative feedlot, there is even more reason to question the hypothesized industry's feasibility.

CONCLUSIONS

The findings indicate that cattle feeding can be a profitable enterprise under certain Southeastern conditions. For example, by feeding a proper combination of locally produced feedstuffs, a Florida feeding operation can expect returns comparable with those achieved in other parts of the country. The net returns from the hypothesized firm do not, however, indicate that a large-scale feeding industry, such as in the Midwest or Southwest, should develop in Florida.

In the Florida example, a feedlot industry of sufficient size to finish all the feeder calves produced in the state would require that large quantities of locally produced feedstuffs be readily available. Feedstuffs such as rough-

TABLE 6. AVERAGE NET REVENUE PER HEAD (IN DOLLARS) FROM FEEDING FOR A FLORIDA FEEDLOT INDUSTRY.

	Total local feed produced available	Feed production less exports available
Gross margin	133.98	133.98
Fixed cost	11.24	11.24
Other variable cost	20.71	20.71
Feed cost	95.58	105.74
Death loss	4.40	4.33
Total cost	131.94	142.02
Net revenue	2.04	-8.04

ages are abundantly produced, but the energy or concentrate feedstuffs are not. Because of this limited supply of Florida-produced concentrate feedstuffs, the large-scale industry would soon face feed shortages and would need to import much of its concentrates. Such an action generally incurs more transportation cost than transporting the beef itself. The combination of limited supplies of locally produced concentrate feedstuffs and the high cost of importing substitute feedstuffs results in unprofitable conditions for the feedlot industry. Consequently, before Florida could support a feedlot industry, a large, simultaneous (or prior) expansion in the quantities of locally produced concentrate feedstuffs would be necessary.

This study does not answer all of the questions related to cattle feeding in Florida. The results obtained for the representative firm indicate that a feeding operation in Florida could produce slaughter cattle and could be economically feasible. The results also show, however, that a feeding operation in Florida has the potential to both make and lose a large amount of money. To fully evaluate the problem, further study is needed on (1) animal procurement and marketing, (2) production, procurement, and distribution of feedstuffs, and (3) the potential of hedging to avoid price risk. In addition, research is needed to include consideration of the production of slaughter beef by small-scale feedlots feeding "home grown" feedstuffs, an industry less than the size necessary to finish all available feeder calves, and Florida's comparative advantage in the production of feeder calves of various weights.

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