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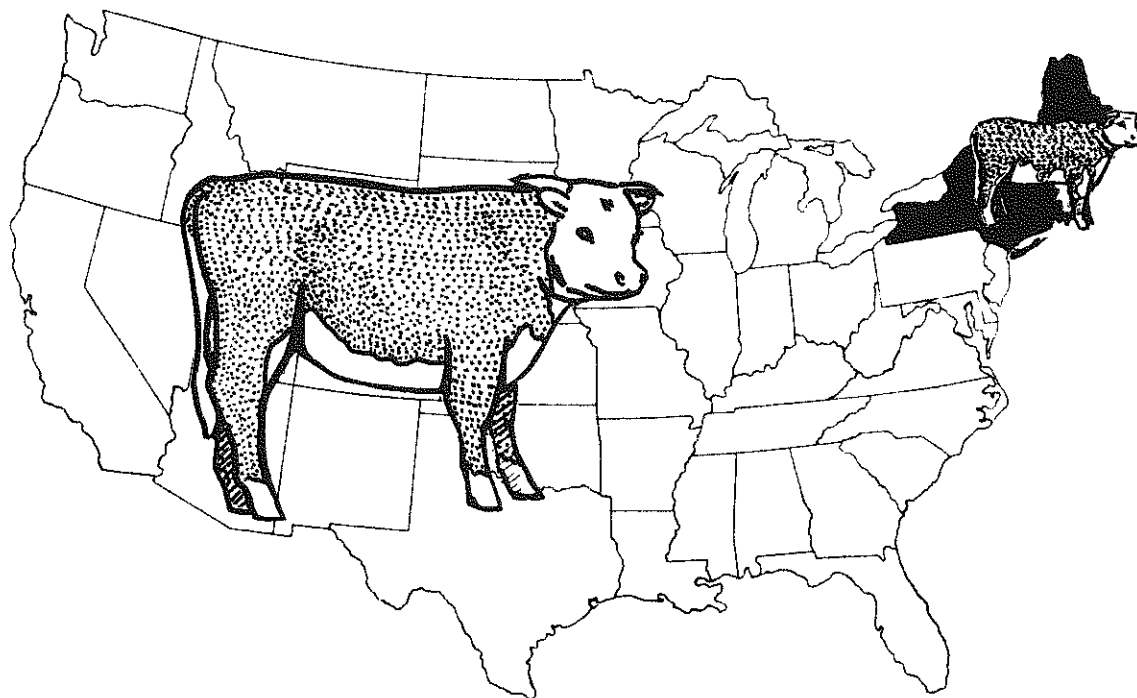
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THE ECONOMIC FEASIBILITY OF EXPANDING BEEF PRODUCTION IN NEW YORK AND THE NORTHEAST: SUMMARY REPORT



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PREFACE

This bulletin summarizes and reviews the major findings of a 14-month analysis of the dairy beef and traditional beef breed sector in the Northeast, with particular emphasis on New York. More detailed reports on specific topics are listed in the reference section. This study was done on contract for the New York Department of Agriculture and Markets with funds from the Agricultural Marketing Service of the USDA.

BACKGROUND AND JUSTIFICATION

Red meat production in the Northeast has been in a decline since the westward expansion of agriculture. Particularly affected has been fed beef production which moved west to areas relatively more abundant in feed grains.

In recent years two significant factors emerged which justify a re-evaluation of the potential of expanded fed beef production in the Northeast. First, recent feeding experiments at Cornell University have demonstrated the potential for utilizing large quantities of forage to feed steers. In New York alone an estimated 1.4 million abandoned hillside acres are available and more acres are likely to be released if the decline in dairy farm numbers continues. Further, the reduced reliance on purchased concentrates combined with the lowering of marbling requirements for choice beef make feeding dairy steers a more viable enterprise than in the past.

Another major change has been the rise in energy prices which has increased the cost of shipping meat into the Northeast. Particularly affected are Northeast fed beef packers who must import live animals from over 1,000 miles from Joliet and other major producing and marketing regions. Presently Northeast packers rely on out-of-state sources for approximately 65 percent of the annual 450,000 head fed beef kill.

Conditions do not exist for the Northeast to become a major fed beef producing region. Opportunities exist, however, for expansion with under-utilized resources. On the production side these include resources made available by dairymen who have exited dairying and are seeking a supplementary livestock enterprise. A second category includes cash crop farmers who are seeking livestock enterprises through which they can market their grain to increase profits. In addition, throughout much of the region part-time operators own grazing land potentially suited to cow-calf operations. In

fact, many of the estimated 8,000 beef breed producers in New York are in this category.

At the processing level, regional producers have the potential to displace some of the almost 300,000 head of fed cattle annually brought into the region for slaughter. The construction of additional capacity may be justified if the need is sufficiently large or if new plants can achieve significant operational or locational economies.

OBJECTIVES

The overall objective of evaluating the economic feasibility of expanding fed beef production in the Northeast is divided into two operational objectives:

1. Farm Management - Investigate the economic viability of alternative feeding and management systems for (1) dairy beef to feeder and slaughter weights, and (2) traditional beef breed cow-calf operations with sale of calves at feeder weights.
2. Marketing - Evaluate (1) the sufficiency and viability of existing regional slaughter capacity, (2) the price effect on bob dairy calves of reduced veal slaughter, and (3) alternative assembly and pricing systems as a means of increasing net prices received by producers.

SUMMARY OF FINDINGS

Feeding and Management Strategies

Alternative feeding and management systems for producing beef from dairy steers were examined. On dairy farms, the most profitable system is to raise the steers with the replacement heifers until 9-10 months of age using the identical ration balanced for optimal growth of the replacement

heifers. During that period, heifers are fed to attain an adequate size for first breeding at 14-15 months. Fastest gains are usually obtained prior to puberty at about 9-10 months after which the energy level is often reduced to prevent excess fat deposition in mammary glands. During the first 9-10 months, the heifer ration contains 65-70 percent TDN, a desirable energy level for steers if the objective is to optimize forage utilization. Lower energy levels result in a high proportion of the feed being used for maintenance. When the energy level is lowered for the heifers after 10 months, the steers should be separated and kept at the original energy level or placed on a higher plane of nutrition.

In feeding trials with Holstein steers at Cornell, forages were clearly best utilized prior to 800-900 pounds. Dry matter intake reached a maximum at that weight. Subsequent feeding programs required higher energy levels as a proportion of dry matter. Diets higher in grain also increased the commercial acceptance of dairy beef carcasses at 1200 pounds live weight (1,2,3).^{*/}

New York has high quality pastures during the grazing season, and therefore can support beef cow-calf units with a high performance potential during the grazing season. However, because of the long wintering period and the limited availability of high energy feeds in New York, it may not be feasible to finish all of the calves that could be produced. If enough high quality forage can be harvested, calves can be wintered and sold as yearling feeders. In limited instances, where grain or suitable by-product feeds are available at a competitive cost or a marketing advantage exists, the weaned calves can be finished profitably. For beef cow-calf production to be competitive in the region as a part-time or supplemental farming enterprise, it must

^{*/}The numbers in brackets identify the source materials listed at the end of the bulletin.

effectively utilize abandoned hillside land and available labor and capital.

Profitability of Alternative Production and Management Systems

A major thrust of this project concerned the profitability of alternative production systems for fed beef in New York and the Northeast. The analysis of these systems was divided into an evaluation of raising dairy beef on dairy farms and an evaluation of cow-calf operations as part-time farm businesses.

Feeding Dairy Steers to Feeder and Slaughter Weight

On most Northeastern dairy farms, bull calves are considered superfluous output and are sent to auction markets as soon as possible. Several alternatives for expanding the dairy farm business that utilize the bull calf as a profitable resource are possible. The alternatives that are most complementary to the on-going dairy business will be particularly attractive to dairy farmers.

The potential profitability of alternative dairy beef steer production and feeding systems was investigated by analysis of two representative dairy farms. The first is typical of many small farms in the Northeast with a small herd of 40 cows and restricted number and productivity of crop acres. The second farm has a larger herd of 80 cows and a larger crop acreage base (Table 1). This farm also has above average crop acres per cow. Farms with large dairy herds (100 plus cows) were excluded as it is unlikely these businesses would be interested in dairy beef. Milk production and crop yields specified for the analysis represent average to above average management and soil resources.

Table 1. Production Characteristics of Representative Northeastern Dairy Farms Studied

	Small Dairy	Large Dairy
Dairy Herd Size	40 cows	80 cows
Milk Sold Per Cow	13,000 lbs.	13,000 lbs.
Dairy Replacements	Raise on farm	Raise on farm
Calf Death Loss ^{a/}	15 percent	15 percent
Calving Interval	13 months	13 months
Crop Acres	120	300
Maximum Corn Acres	30 and 60	220
Hay Crop	Mixed Mainly Grass	Mixed Mainly Legume
Crop Yields:		
Hay ^{b/}	2.5 tons/acre	--
Hay Crop Silage ^{c/}	--	6.2 tons/acre
Corn Silage ^{d/}	13 tons/acre	16 tons/acre
High Moisture Shelled Corn ^{e/}	--	95 bushels/acre

^{a/} Birth to freshening or sale;

^{b/} 88 percent dry matter;

^{c/} 47 percent dry matter;

^{d/} 33 percent dry matter;

^{e/} Dry corn equivalent (89 percent dry matter).

As the available corn acreage on the small farm crucially influenced the results, two different levels of maximum corn acreages were analyzed. The desirability of raising dairy beef feeders with dairy heifers and selling the feeders and, alternatively, feeding the calves to slaughter weight, were evaluated by comparing the enterprise organization, feeding systems and profitability of three alternative dairy beef systems with the dairy operation (base system) for each of the representative farms.

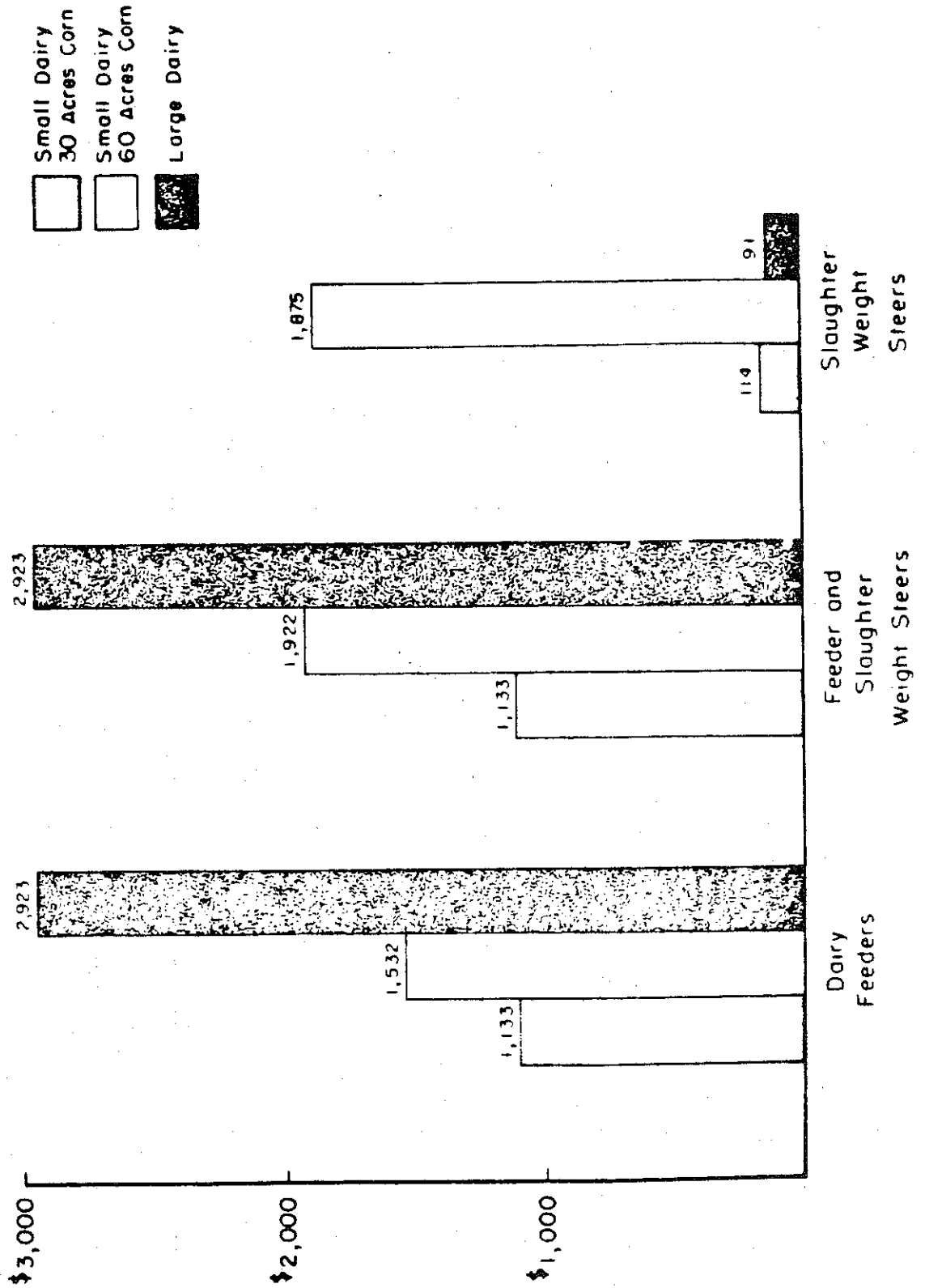
The three beef production systems analyzed are:

1. Dairy Feeders: steers sold as feeders.
2. Feeder and Slaughter Weight Steers: dairy steers sold as feeders or fed to slaughter weight, whichever is more profitable.
3. Slaughter Weight Steers: feeder market not available; bob calves sold or raised to slaughter weight.

Three forage compositions were considered for each of three growth periods for the dairy beef. Corn grain, soybean meal and minerals were added to provide a high-roughage, low-grain balanced ration. The three alternative forage compositions were all hay crop, equal parts dry matter from hay and corn silage and maximum amounts of corn silage. The three growth periods were, birth to 540 pounds with the heifers, 540 to 850 pounds, and 850 to 1250 pounds.

Labor and management income can be increased by inclusion of dairy beef (Figure 1). For the prices specified, raising dairy beef with heifers and selling feeder calves was the most profitable alternative. Only for the small dairy farm with the larger corn acreage was feeding to slaughter weight an attractive alternative. The results suggest that when crop acres are limited and cash grain enterprises are profitable, dairy beef is less attractive (7,2,3).

FIGURE 1. INCREASE IN OPERATOR LABOR AND MANAGEMENT INCOME FROM DAIRY FEEDERS, DAIRY FEEDER AND SLAUGHTER WEIGHT STEERS AND SLAUGHTER WEIGHT STEERS PRODUCTION SYSTEMS.



Cow-Calf Enterprises

The beef cow-calf industry in the Northeastern U.S. is characterized by a large number of small farms. Fox estimates that New York State's 130,000 beef cows are located on 8,000 farms. As the income generated by these small herds is not enough to support a full time business, a majority of these enterprises are likely supplemental to another farm enterprise or to an off-farm job. In fact, 18 of 25 beef producers in the 1977 and 1978 Beef Farm Business Summaries considered the beef herd a supplemental enterprise. A beef cow-calf operation is relatively compatible with off-farm work because it can be integrated easily with other demands for the operator's labor and management.

The research demonstrated that for Northeast cow-calf producers use of "returns to operator labor and management" does not necessarily provide sufficient information to determine economic viability. The analysis conducted under this project extends previous research to determine change in net worth, change in after-tax income and cash flow in addition to return to operator labor and management. For the analysis, a representative farm with 150 acres of marginally productive land was specified based on data from two studies in progress at the Cornell Animal Science Teaching and Research Center in Harford, New York. Four management systems with varying intensities of forage production were compared (Table 2).

Under the assumptions used in this study, none of the systems analyzed showed a positive labor and management income over the ten-year time horizon of the analysis (Table 3). When income tax and capital gains considerations were included, the economic viability of regional cow-calf operations proved much more favorable (Table 3). By way of definition, the net present value of the tax shield made possible by the cow-calf operation indicates the return

Table 2. Characteristics of Cow-Calf Management Systems Studied

Item	System			
	1	2	3	4
No. Cow-Calf Units	20	19	32	40
Hayfield Acres	Hay purchased 0	Unimproved 70	Improved 70	Improved 70
Pasture Acres	Unimproved 130	Unimproved 60	Unimproved 60	Improved 60
Hay Yield (tons/A)	--	1.0	2.0	2.0
Protein Content Hay (%)	12	8	12	12
Purchased Hay	\$2,973	0	0	0
Purchased Concentrate	\$434	\$542	\$610	\$763
Investment in Machinery	\$6,000	\$12,800	\$18,800	\$18,800
Investment in Building Renovation and Fence	\$4,385	\$5,004	\$5,004	\$5,004
Hours of Hired Labor	0	122	244	244
Months of Unpaid Family Labor	0.4	0.6	0.8	1.0

Table 3. Economic Viability Measures for Four Management Systems,
Part-Time Cow-Calf Operations, Ten Year Planning Horizon

	1	2	3	4
Net Cash Farm Income ^{a/}	260	1753	959	(-185)
Return to Labor & Management ^{a,b/}	(-3688)	(-3025)	(-4880)	(-6410)
Change in Net Worth	86,041	86,759	105,590	116,389
<u>Average Cash Flow, Years 1-4</u>				
<u>Off-Farm Taxable Income</u>				
\$25,000	(-3946)	(-3653)	(-4675)	(-11900)
45,000	(-3115)	(-2781)	(-5287)	(-8020)
65,000	7007	7370	8577	4740
<u>Net Present Value of After-Tax</u>				
<u>Cash Flow</u>				
<u>Off-Farm Taxable Income</u>				
\$25,000	10554	16477	7263	(-1935)
45,000	12350	18419	17569	8998
65,000	77839	83899	85955	8460

^{a/} Ten-year average.

^{b/} Equity capital charged at a real cost of capital of three percent.

in today's dollars from the investment after considering the reductions in the operator's income tax payments. When other taxable income was large, the return attributable to the beef operation was increased as a result of investment credit and annual tax savings. In addition, the increase in net worth from the cow-calf investment at the end of ten years is approximately \$100,000 for each system.

One of the problems with a beef cow-calf operation is the large negative cash flows (e.g., expenditures in excess of income from the enterprise) for the first two to four years. In this study average cash flow in years one through four was negative except for the highest off-farm taxable income category (\$65,000). Some operators who do not charge all costs (such as land previously held idle) to the cow-calf operation may find the effect on cash flow more favorable than reported here. It is important, however, to recognize that the actual profitability of the enterprise is unchanged.

The most appropriate overall measure of the economic viability of the part-time, cow-calf operation is the net present value of the investment cash flow. This figure measures the value in today's dollars of the profits and losses in each of the ten years and the market value of capital assets at the end of the ten-year period. Based on this measure, cow-calf operations are economically viable at all off-farm income levels studied (8).

Marketing Systems and Alternatives

Marketing of feeder calves and slaughter cattle has been a persistent problem in the Northeast. The most critical difficulties have been faced by producers who have too many head for home consumption but lack sufficient numbers to assemble truckload lots. As part of this study, three aspects of the marketing environment are considered: (1) the price effects of reduced

calf slaughter, (2) the adequacy of regional slaughter facilities, and (3) the alternative assembly and marketing arrangements.

Reducing Calf Slaughter

New York and the Northeast are the major calf slaughter regions of the country. The principal source of calves is surplus bob calves which are killed within a week of birth or, for an increasing number, following a grow-out period on a specialized low-iron diet. Supplies of vealer calves have dwindled as a result of the 50 percent reduction in the dairy herd over the past 20 years. Concerns have been expressed that an increase in dairy beef production, which would further reduce the veal calf supply, would lead to price increases for the available animals. If the increases were sufficiently great, the attractiveness of dairy beef as a supplementary enterprise could be reduced.

The price effect of reduced calf slaughter was evaluated using a simultaneous equation system representing the price effects from reduced veal production through processor margins back to farm level prices. The results project that a 10 percent reduction in regional calf slaughter (180,000 head in 1978) would lead to a three percent increase in calf prices.^{*/} This level of price response, which amounts to 2.8 cents per pound at 1978 prices, is relatively insignificant to the profitability of dairy beef production (6).

Slaughter Capacity

Expanded regional fed beef production requires that sufficient slaughter capacity be available to handle the volume. Capacity may be available in the form of underused existing facilities, it may be developed through conversion and modernization of existing plants, or by new construction.

^{*/}Price flexibility at the mean of 0.32.

There are 407 federally inspected cattle slaughter plants in the Northeast with the heaviest concentration in Pennsylvania. In 1976 these plants slaughtered 1.5 million head of cattle of which 40 percent were steers and heifers. Many of these animals originated from outside the region, although a precise accounting is difficult because of limited regional production figures, particularly for beef breeds.

Unpublished records of the USDA Meat Inspection Service show significant excess capacity in the regional cattle slaughter industry. Much of this surplus capacity, estimated on an average aggregate level of just under 60 percent, is traceable to declines in the dairy herd over the past 20 years. Many of these underused plants could be converted to fed beef slaughter with the relatively simple addition of a shrouding station. Further capacity increases are possible by scheduling a second shift and Saturday kill, or by an enlargement and modernization of the kill floor to increase the line speed. Significant additions to slaughter capacity will require larger chill boxes. Nevertheless, preliminary economic engineering analysis of the sector shows that converted plants can operate at costs significantly below the \$27-31 per head typical of a new plant in the 100,000-200,000 head capacity range. Overall, there is no evidence of capacity limitations. Requirements for the foreseeable future can be met with the conversion/modernization of existing plants without major new construction (10).

Kosher slaughter provides a particular opportunity for the region. One form of kosher meat (glatt kosher) must be consumed, frozen or koshered within 72 hours of slaughter. Given present industry structure in which koshering is done near consuming regions, particularly New York City, the time constraints of glatt kosher necessitate that this slaughter be done near koshering facilities. Thus, despite the recent closings of two large

kosher packing plants in the Northeast, the existence of a glatt kosher slaughter plant in the New York Metropolitan area is likely assured over the next 5 to 10 years. Beyond that period competition from an integrated midwestern plant is a possibility if a group of supervising rabbis is willing to resettle there. According to the best available estimates the kosher beef market is not growing sufficiently to require additional slaughter capacity in the Northeast for the foreseeable future (4).

Marketing Alternatives

Marketing of feeder calves and fat cattle has been and will remain a significant problem within the Northeast. Because producers are small and dispersed and quality is variable, marketing systems used in major producing areas are inappropriate. Existing alternatives, most commonly local livestock auction sales, are inefficient and costly. Improvements will require assembling larger numbers of uniform animals in one place. Survey results indicate that both producers and major buyers recognize the limitations of the current systems and appear ready to consider alternatives. Alternative assembly arrangements are needed to assist in the pooling of feeder and finished cattle from small herds into uniform truckload lots. Assembly may be done prior to sale such as through a joint direct sale or at the sale in the case of a beef pool. Yet, until these arrangements are widely available, and there is no evidence it will be soon, many producers will have to rely heavily on existing terminal or auction markets or, in the case of smaller feeders, on direct sales to consumers (feeder beef). Larger producers have a number of direct sales opportunities throughout the region (9,5).

IMPLICATIONS AND CONCLUSIONS

1. Under the conditions studied, corn silage is the most profitable forage to feed growing and finishing beef animals. Conversely, diets high in hay crop typically lack sufficient energy for economic rates of gain.

2. Where acreage is available for growing additional forages, dairy steer production is a viable supplementary enterprise.

3. Dairy beef operations are most likely to occur when expanded milk production is neither desirable nor feasible and when viable beef markets exist.

4. The choice between selling dairy beef as feeder calves or at finished weights depends on the price and availability of feed, and on the relative sale prices of the two animal classes.

5. The economic aspects of beef cow-calf operations -- negative returns to operator labor, low labor requirements, potential tax shield benefits and gains in net worth -- suggest that this enterprise will be most attractive to part-time operators desiring utilization of surplus resources, or as a supplement to other primary farm enterprises.

6. Purebred beef production and cow-calf plus finishing with direct-to-consumer sales may be more profitable than the commercial market oriented cow-calf operation analyzed as part of this study.

7. There is no shortage of slaughter capacity. Future needs can be met more economically by conversions of existing plants than through new construction.

8. Competition for calves between veal operators and feeders will not lead to sharply higher calf prices at foreseeable production levels.

9. Low prices (compared to national levels) and high marketing costs are currently significant impediments to growth of cow-calf and feed beef

production in much of the Northeast, particularly for the numerous less than truckload producers. Marketing alternatives to minimize these limitations potentially can be developed, but significant coordination among independent producers will be required for many to succeed. Substantial delays may be experienced before the necessary leadership emerges.

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