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SOME FACTORS AFFECTING THE FUTURE OF BEEF PRODUCTION IN NEW ENGLAND

Robert L. Christensen

INTRODUCTION

In 1979 it was estimated that the total number of cattle and calves on farms in the six New England states was 717,000 head. To place this in perspective, this number corresponds to one-fourth the number of head on Illinois farms in that year. Put another way, the New England cattle inventory is 0.6 percent of the national herd. Beef cow numbers in New England totaled 42,000 head in 1979 or 0.1 percent of the national beef cow herd. As nearly everyone knows, the dairy industry is responsible for the bulk of the cattle industry in the region. The number of beef type heifers and steers over 500 pounds (a rough indicator of marketings) for the region was 24,000 head in 1979. Cattle slaughter in New England plants (including cull dairy animals) totaled 161,500 head in 1978 or 0.4 percent of the national slaughter figure (Agricultural Statistics, 1979).

It is probably redundant to say then that beef producers in New England do not make a major contribution to the national supply. Not only that, but it has been estimated that the region produces only about 3.25 percent of the red meat consumed within the region (Bahn and Christensen, 1979). This leads one to the obvious, but simplistic, conclusion that a great unexploited potential market exists. Further, some project a resurgent agriculture in New England due initially to energy costs in production and transportation which will enhance the competitive position of regional production. In the longer run (so the scenario goes) a renewed agriculture in the region will come as demand expands to meet production in currently surplus regions and as energy shortages limit yields and cause the transport system to grind to a halt. Reality is probably much less extreme.

Obviously, changes in supply-demand conditions among regions will occur over time. It also seems that the energy situation will cause some fundamental changes in the marketing of foods unless new supplies or alternative sources are not forthcoming over the next decade or so.

With this as background, let me first detail a few more characteristics of the beef production and marketing sectors in New England and then discuss some aspects of competitive advantage and interregional competition.

THE STRUCTURE OF THE LIVESTOCK INDUSTRY
IN NEW ENGLAND

As has been detailed previously, the number of beef animals within the region is relatively small. The sale of cattle for slaughter is heavily weighted by the cull cow and calf sales from dairy herds. The climate and topography of New

England is such that forage crop production is most adapted to conditions. Yields of hay and corn silage in the region are competitive with those in other regions while production of feed grain crops are subject to both uncertainty and potentially lower yields.

According to the 1978 Census of Agriculture, there were 1,305 farms in Massachusetts having beef cows and there were an average of 8 cows per farm. On the 620 farms with sales of \$2,500 or more the average number of cows per herd was only 12 (1978 Census of Agriculture, Massachusetts). More than half the farms having beef cows grossed less than \$2,500 per year. Assuming Massachusetts to be representative of the region, it is obvious that the large majority of farms with beef animals is small by the standards of other regions.

"With rare exception, intensive feeding operations have not succeeded in Massachusetts and so...standardization and regularity of slaughter animal supply has not been possible. Massachusetts's comparative disadvantage...has resulted in fewer red meat animals being raised locally and in a more difficult marketing situation. This appears to be especially the case for beef and pork, which because of less grain finishing tends to be...of a lower quality than that raised in other regions... This situation results in severe limitations on the marketing alternatives available to local producers." (Stinson, et al., 1978)

MARKETING OF BEEF ANIMALS IN NEW ENGLAND

"Because beef herds in Massachusetts are characteristically smaller in size than dairy or hog enterprises, farmers desiring to sell beef animals...appear to rely to a much greater degree on the informal market... Direct sale to slaughterhouses does not appear to be a prevalent marketing channel... Producers of all species rely heavily on the state's three livestock auctions..." (Stinson, et al., 1978)

There were (in 1978) sixteen livestock auctions in New England. Typical is an auction in Whately, Massachusetts which, for a 12 month period in 1974-75, sold 4,163 head of cattle (Stinson, et al., 1978). Since this auction operates one day per week, a simple average indicates that approximately 80 head are sold during an auction session. Further, it is probably safe to assert that perhaps two-thirds of the cattle sold are cull dairy cows. This means that on any given auction day no more than 30 head of beef type animals will be sold with considerable variation in weight and grade among these animals. It is not surprising that such numbers fail to attract more than a small handful of buyers and

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that prices offered bear little relationship to what might be expected from interregional economic modeling.

In 1978 there were 21 slaughterhouses in Massachusetts of which 9 were commercial in nature and 18 were classified as "custom" operations. Two plants accounted for 85 percent of the total cattle slaughter. It was estimated by Stinson (1978) that 22,280 head of cattle (both beef and dairy) are slaughtered annually in Massachusetts. This means that 19,000 head were slaughtered in two plants and 3,280 (approx.) were divided among the remaining 19 plants. Total cattle slaughter capacity was estimated to be 121,000 head annually. These data make it immediately evident that Massachusetts' slaughter plants have capacity far in excess of the expected production. It is of interest to note that unused capacity was primarily found in custom plants. Livestock were imported from other states within the region and from other regions to keep the commercial establishments operating at 97 percent of capacity.

In spite of these facts it is commonly agreed that the needs of small scale producers are not adequately met. Commercial facilities are generally uninterested in buying or custom processing animals from producers who may have fewer than a half dozen animals to market at a given time (recall the small size of herds). The dispersion of custom slaughterers, which necessitates scheduling and transportation, leads to cost and inconvenience for the small operator who must also find buyers for the carcasses.

The total number of slaughter plants in the six state region was found to be 114 in 1973 (Yurker, et al., 1976). As inventories of animals decline, it may be expected that slaughter facilities will similarly decline in number. Critical to the survival of these plants will be their scale. What must be weighed are the higher per unit slaughter costs associated with smaller plants against the lower costs of transportation related to market proximity.

TRANSPORTATION COSTS AND LOCATIONAL ADVANTAGE

As energy costs increase, which in turn increase the cost of transporting goods, market prices of those goods should increase for consumers in importing regions (or fall for producers in exporting areas). Some individuals within the New England agricultural community have asserted that rising costs of long distance transport increases the delivered price of imported food products and hence local prices. This is viewed as enhancing the comparative advantage of New England production. It may be useful to examine this contention more explicitly.

The basic transportation model of interregional competition between two regions for a single product can provide the first set of insights. Higher fuel costs affect the variable cost portion (distance related) of the transportation cost function. Since both "surplus" and "deficit" regions' transport cost functions are affected by higher fuel prices, it can be shown that the market boundaries between the regions are unchanged (Bressler and King, 1970). Thus,

there can be no apparent expansion of market area on the part of the deficit region.

A paper presented at these meetings illustrates a modification of the Samuelson model of interregional competition (Dunn, 1981). He shows that the obvious conclusion (i.e., an increase in transportation cost increases production in the importing region and decreases it in the exporting region) is not necessarily valid. Since energy is also used in producing the product the supply functions are affected in each region and further, the prices of substitutes and disposable income also affect the demand for the product. The impact on trade is consequently more difficult to determine than is initially the case. Dunn's econometric analyses may be summarized as showing:

- (1) For all models the price in the importing region rises much more than in the exporting region.
- (2) In all cases, production in the importing region shows a less than 10 percent increase with a doubling of real energy price.
- (3) For goods with less elastic demand, the increase in production in the importing region is greater.
- (4) The increase in production in the importing region is greater as the region is less self sufficient.
- (5) The larger the transportation component is of total price, the greater the increase in production in the importing region.

Dunn concludes by stating, "Under no circumstances does the model suggest that higher energy prices will bring about an agricultural renaissance to the Northeast."

These conclusions are supported by a much simpler analysis reported in the JNAEC (Christensen, 1980). He calculated the impact of an increase of 50 cents per gallon in transportation fuel prices on the delivered cost of beef shipped from Nebraska to Massachusetts. Assuming direct pass-through of added fuel costs the impact on consumer prices would be about .5 cents per pound. If it is assumed that the New England beef producer receives an equivalent price increase, the value per head was calculated to be \$2.80 for a 1,000 pound live animal. It should be obvious that increases of this magnitude coupled with the average size of the New England beef herd will not engender significantly expanded production.

IMPLICATIONS FOR THE FUTURE OF THE BEEF INDUSTRY IN NEW ENGLAND

New England's climate is ideal for forage production. However, New England's endowment of land for crop production is meager compared to livestock producing states. A variety of conditions make it important that the scarce land resource be used in intensive rather than extensive ways. Beef will compete most directly with dairy for the land resource. Returns to dairying in this region tend to be higher than returns to beef production. It appears unlikely that dairy production will be displaced by beef production unless rather drastic changes occur in relative

prices.

While some have advocated a beef industry in the region based on forage feeding, the fact remains that high quality carcasses are unlikely on such a feeding regime. Since in most cases feed grains must be imported, energy costs in transportation of grain will offset much of the locational advantages with respect to the sale of beef animals. This is particularly a problem when selling costs are found to be higher in New England (Yunker, *et al.*, 1976) and when lower prices in New York markets are attributed to high buying costs per head in areas of sparse production a situation analogous to the New England condition (Lesser, 1981).

At the same time there will continue to be some beef production in the region. Some of this will be of the "hobby farm" type. Some will exist because of unique circumstances such as a favored market for the animals produced or a special resource situation. In a few cases beef production may be a supplementary enterprise on a dairy farm which utilizes surplus resources.

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