Emerging Issues in Food Marketing and Distribution in the Northeast

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Food marketing and distribution encompasses a vast array of economic and regulatory activity. In the most recent product of NC-117, the authors argue that: "The food manufacturing and distribution industries are the primary orchestrators of the food system. Not only do these industries perform essential tasks themselves, but they also have significant influence over the rest of the food system: backward on agricultural production and forward on consumers." (Marion, p. 432) It is tempting to draw a more complete path diagram with which to emphasize ways in which consumers, farmers and other entities, including regulators, influence and are influenced by these "primary orchestrators". I will, however, follow the lead of the NC-117 committee and concentrate on these "primary orchestrators" in the Northeast.

Food Manufacturing in the Northeast

Food manufacturing is an important activity in the Northeast. It generated jobs for 5% of the manufacturing sector's workforce in 1982 and 8% of the value added by all manufacturing in the region in 1982 (Table 1). This sector is about four times as important (in terms of value added) as is primary agriculture.

The food industries in the Northeast are quite diversified with the more prominent activities being processed meats; poultry dressing and processing; packaged fluid milk, cheese, and ice cream; bakery products; canned fruit and vegetable specialties; chocolate and confectionery; malt beverages and soft drinks; potatoe chips; pet foods; and seafoods. In a forthcoming book, Connor shows the following diversification indexes for the nine Northeastern states, where diversification is measured as the percent of food manufacturing in the state accounted for by the top 10 product classes:

Connecticut	52.0
Maine	53.2
Massachusetts	49.2
New Hampshire	69.5
New Jersey	35.2
New York	36.0
Pennsylvania	33.2
Rhode Island	57.7
Vermont	82.1

A quick examination of trends in some of the performance measures for the food manufacturing industries in the Northeast will set the stage for the discussion that follows. For this purpose I concentrate on the four states of New Jersey, New York, Pennsylvania, and Massachusetts partly because these are the most important food manufacturing states in the region and partly to avoid data disclosure problems involved in using Census of Manufacturers data for the remaining states in the region. In this analysis I also concentrate on trends over the period 1972 to 1982. Admittedly this makes the analysis somewhat dated, but 1982 is the last year for which census data is available. Extrapolating on the basis of a ten-year history is somewhat hazardous. I have, however, attempted to ensure that the trends I discuss are consistent with those identified by the team working on the Toward 2005 Project (Northeast Regional Council) which were based on a longer time series.

Number of Establishments—The number of food manufacturing establishments[1] in the Northeast has declined fairly rapidly over the past 10 years, mirroring a nationwide trend. *The decline in number of establishments has been greater in the Northeast than in the U.S. as a whole, however.* The decline in number of establishments has been most pronounced in meat packing, poultry dressing and processing, and dairy processing. But substantial declines have also been registered in canned fruits and vegetables; pickles, sauces, and dressings; flour

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[1] A given company or firm may have several "establishments" and may even have more than one "establishment" at the same location.

Table 1. Importance of Food Manufacturing in the Northeast, 1982

	Food Mfg. Employment as a % of all Mfg. Employment	Food Mfg. Value Added as a % of all Mfg. Value Added	Food Mfg. Value of Shipments as a % of all Mfg. Value of Shipments
Connecticut	2.2	3.3	4.1
Maine	8.4	8.2	11.0
Massachusetts	4.0	4.5	7.8
New Hampshire	2.3	4.7	7.7
New Jersey	5.2	10.3	11.4
New York	4.7	7.5	10.1
Pennsylvania	7.2	11.0	12.9
Rhode Island	2.3	3.1	4.6
Vermont	4.9	4.6	13.5
Northeast	5.0	8.0	10.0
United States	7.8	10.7	14.3

Source: Connor.

and mill products; bread, cakes, and related products; confectionery; fats and oils; and beverages.

Production Workers—The number of production workers[2] in Northeast food manufacturing has also declined and again *more rapidly than in the U.S. as a whole.* Clearly increased mechanization leading to greater labor efficiency has led to a smaller number of employees in these industries. Northeast labor efficiency in much of food manufacturing appears to be below that of the U.S. Even so, the substantial decline in number of establishments and labor saving mechanization has meant a greater decline in food manufacturing employment in the region relative to the U.S. as a whole.

Output—Output of the food manufacturing industries in the Northeast measured in value added terms[3] *has not kept pace with that of the Nation as a whole.* The Northeast's percentage share of the Nation's value added in the nine 3-digit industries for 1972 and 1982 is as follows:

	1972	*1982*
	--percent--	
Meat Products	11.9	9.5
Dairy Products	19.4	14.6
Preserved Fruits & Vegetables	19.2	16.8
Grain Mill Products	9.4	11.0
Bakery Products	24.2	22.0
Sugar & Confectionery	37.2	33.2
Fats and Oils	15.7	7.7
Beverages	18.5	15.5
Miscellaneous Food & Kindred	24.0	18.1

A study of the 4-digit industries making up these aggregates will reveal that the greatest declines have been in meatpacking, cheese, and ice cream. Interestingly enough, the Northeast's share of total U.S. output is up in poultry and egg processing and in canned fruits and vegetables.

Plant Size—Plant size measured by real value added per establishment in several of the Northeast food manufacturing industries is *below that in other regions.* This is particularly true in meat products, dairy products, and preserved fruits and vegetables. Plant size of most of the Northeast food manufacturing industries has increased between 1972 and 1982, but *not at the same rate as in other regions.*

Plant Efficiency—Real value added per production worker is a measure of plant efficiency with respect to only one of the inputs used—labor employed in manufacturing processes. Since plants in different industries use labor in different proportions, this measure should not be used to make general judgments across industries. For a given industry, however, it provides a fairly good index for evaluating plant efficiency over time and in different regions.

[2] Production workers are working foremen and all workers below the working foreman level engaged in the manufacturing operation of the establishment. Excluded are all personnel engaged in nonproduction activities such as sales, delivery, advertising, legal, cafeteria, or construction of plant additions or alterations; executive personnel and supervisors above the foreman level; and self-employed or unpaid family workers.

[3] Value added represents the net cost of assembly, processing, and merchandising functions performed by the manufacturing establishment. It accounts for labor, depreciation, service costs, taxes, insurance, and profits or returns on investment. It is derived by subtracting from the value of shipments of products manufactured and receipts for services rendered, the cost of raw materials, supplies, containers, fuel, and electricity used in manufacture, as well as any contract work done by others. It thus measures the sum of the industry's payments for wages, interest, rent, and profits.

Based on this measure, plant efficiency has generally fallen in the meat products and dairy products industries in both the Northeast and the U.S., *but generally more precipitously in the Northeast.* There are industries in some states of the region where plant efficiency has outstripped that of industries in other regions—most notably, dairy products in New Jersey and fruit and vegetable specialties in New York. But these cases constitute the exception rather than the rule.

New Capital Expenditures—Capital expenditures on new plants and equipment includes expenditures for permanent additions and major alterations to plants and for new machinery and equipment for replacements and for equipping additions. This is an alternative to the more common measure of the capital account, depreciation. Unfortunately estimates of depreciation are not readily available.

New capital expenditures per dollar of value added appears on the whole to be on a par with that of the U.S. for most of the food manufacturing industries in the Northeast. One glaring exception is the sugar and confectionery industry where capital expenditures in the Northeast are substantially below par. New capital expenditures per dollar of value added have generally increased in New York and Massachusetts, but have generally decreased in Pennsylvania and New Jersey over the 1972–82 period.

Salaries and Wages—Hourly wage rates of production workers and average salaries of nonproduction workers in the food manufacturing industries have traditionally been higher in the Northeast than in the remainder of the U.S. The differences here have narrowed slightly between 1972 and 1982, but labor costs in the Northeast are still high relative to labor costs in other regions of the Nation.

Future Prospects for Food Manufacturing in the Northeast

In assessing the future prospects of food manufacturing in the Northeast, it is necessary to keep in perspective the fundamental factors affecting plant location. The first of these is certainly transportation. If, for example, processing adds considerable bulk to the basic raw material (ice cream or beverages), or results in a rather fragile finished product (potato chips), or produces a product with a short shelf life (packaged milk or bread) so that the cost of transporting the finished product is relatively greater than is the cost of transporting the raw product, processing will be demand oriented.

If, on the other hand, the raw material is bulky and/or perishable or if considerable loss of weight or bulkiness occurs in processing, processors will be supply oriented. This would be the case, for example, for red meats and poultry, aged cheese, bulk milk, processed fruits and vegetables, and beet sugar.

Thus freight rates are an important determinant of plant location. As freight rates change, location advantages will also change. Reduction in rates of transporting wheat relative to transporting flour, for example, has encouraged flour milling to move from the Central Plains to the East (Blandford et al.). Similarly meat processing has shifted to the producing regions as improved transportation has made shipment of processed meat cheaper.

Labor availability and wage rates are also important to the location decision of the more labor intensive processing industries such as meatpacking and sausage and poultry and egg processing. Other important location factors include water supply, tax rates, and local transportation facilities.

Based on these very general considerations then, we might expect the following industries to thrive in the Northeast: packaged fluid milk, ice cream and specialty dairy products, animal and pet foods, breads and cakes, beverages, potatoe chips, poultry and egg processing, seafood, and perhaps flour milling. Some of the so-called "footloose" industries having a long history of location in the Northeast may also be expected to continue to exist in the region. These would include: canned and frozen specialties, soup mixes, sauces and dressings, breakfast cereals, crackers and cookies, confectionery, chocolate, shortening and cooking oils, and beer and distilled liquors.

Meat Products—Based on past trends and what we know to be important location factors, the future of the meat products industry in the Northeast does not look very bright. Indeed as the Toward 2005 Committee points out: "Regional problems include a deficiency of livestock for slaughter; archaic and inefficient marketing procedures; a limited supply of variable quality raw materials for processing; relatively high labor rates; serious environmental restrictions related to water, sewage and air pollution; a poorly organized industry; an adversary relationship between the industry and regulatory agencies; and minimal use of available academic expertise." (Northeast Regional Council, p. 28) Not a very hopeful, future picture. The best hope appears to be for veal and pork processing although the projections of the Toward 2005 Committee for increased pork production in the region appear to be rather optimistic.

The processed meat industry is more profitable

and stable than meat packing. This business produces consumer products sold on the basis of brand names. As such it is more dependent on product characteristics and less dependent on production efficiency. The major problem is small firm size and therefore lack of access to volume markets. The small size of these operations undoubtedly also limits promotion and merchandising efforts because of scale effects.

Poultry and Egg Processing—It is probably fair to say: "As goes poultry and egg production, so goes poultry and egg processing in the Northeast". Since most people see a bright future for poultry and egg production in the region, this processing activity should also remain. Poultry processing plants, though, will need to be modernized and automated, and capacity for producing further processed products will need to increase. The challenge for the egg industry is to find additional food and non-food uses for eggs.

Dairy Products—Northeast dairy processors enjoy an advantageous location relative to the immense consumer population of the region. There is a growing demand for new specialty cheeses and cultured items. But even here major problems appear to exist. According to the Toward 2005 Committee, "Major industry restructuring, plant facility modernization, and new investments are now required to reposition the industry in a more competitive stance to assure a growing and profitable future. Most Northeast cheddar cheese plants lack the scale and equipment to compete with modern midwestern and western plants. Milk production tends to be geographically scattered for the most part, creating assembly cost problems for new cheese plants of any type. Environmental concerns are especially deep seated in the Northeast, creating serious difficulties and heavy costs to locate plants and handle effluent in a manner acceptable to society. The northern half of the Northeast has a highly fragmented fluid processing industry with a high proportion of old inefficient processing facilities." (Northeast Regional Council (II), p. 62)

Fruit and Vegetable Processing—Establishments in the fruit and vegetable processing industry operate only from May through September or October so that it is difficult to maintain a skilled work force and virtually impossible to optimize operating efficiency. Hence firms in this industry are small and less able to compete with larger, year round processors in other regions. Production volume is not large enough in the region, nor localized enough, to sustain modern operations.

In general, fruits and vegetables are processed near the point of production. An important exception for the Northeast is potato chipping. The economics of fruit and vegetable processing generally favor large scale operations, with a large raw product supply nearby, and, if possible, a long processing season. Climatically, the Northeast is at a disadvantage. Furthermore, the profitability of other enterprises make many Northeastern fruit and vegetable crops more dispersed than is optimal for efficient processing. The prospects of developing significant new processing activities in the region under these conditions appear to be limited.

Grain Mill Products—Most of the value added in grain milling in the region is either in pet food, or in prepared animal feeds destined for the dairy and poultry enterprises. The Northeast has only a few flour mills and other grain milling firms producing intermediate products. The pet food portion will certainly remain in the region since its location is determined largely by transportation considerations. The future of the animal feed portion of the industry will also likely remain given the competitive edge the region has for dairy and poultry.

Emerging Issues

This brief background on food processing in the Northeast suggests several issues that should attract our attention in coming years. The list provided here is by no means exhaustive. Nevertheless it should provide the basis for fruitful discussions and research directions.

Productivity

Polopolus has made us aware of a major problem facing the food manufacturing and distribution sectors—labor productivity. Many components of the food and fiber system are afflicted with sluggish or declining labor productivity growth, particularly food transportation, food retailing, food service, and of some food processing industries. Negative productivity growth rates have been experienced in preserved fruits and vegetables, canned fruits and vegetables, flour products, bakery products, and eating and drinking places, for the 1977–81 period as compared with the 1960–76 period. Lower productivity growth rates have also occurred in blended flour, candy, malt beverages, intercity trucking, railroad, and retail food stores. Many factors contribute to this phenomenon among which are the fact that several food products include an increased amount of built-in services. Also in-

vestment in capital goods have been reduced or deferred in recent years as interest rates have increased. A variety of other reasons could be postulated some of which may be regional specific.

This appears to be a particularly acute problem in several of the food manufacturing industries in the Northeast. The Toward 2005 Committee apparently feels the same way; if not across the board, certainly in some of the major food industries in this region.

Product Promotion

Many people associated with agriculture are rather excited about promotional efforts designed to sell more farm products. In recent years check-off programs designed to provide funds for generic advertising and new product development have increased. Many have mixed feelings regarding the efficacy of these efforts. Nevertheless this will likely be a significant issue for some time to come. Consequently, estimating consumer response to advertising will likely remain a significant research issue.

The best use of such check-off funds may be in new product development. But who should do this development? Why are some industries more innovative than others? What are the institutional limits, if any? Although hard evidence is lacking, the poultry industry seems to have been much more innovative than the dairy industry in new product development. Is there some explanation for this difference? Do government price supports and/or pricing regulations of marketing orders stifle innovativeness?

A final point concerning product promotion relates to exports of processed foods. Kinsey and Heien suggest that the U.S. is most likely to be competitive in exporting semi-processed meats, oils, and cereals and highly processed beverages, fruits and vegetables, nuts, and some fresh fruits. It is not likely to be competitive for highly processed cheeses, chocolates, wines, or other dairy products.

Connor has compiled data showing export dependency ratios of food processors in each state measured in terms of exports as a percent of total processed food shipments. For the states in the Northeast region, the 1982 ratios were:

Connecticut	7.5
New Jersey	5.8
New York	5.6
Rhode Island	4.9
Maine	4.3
Massachusetts	3.8
Pennsylvania	3.6
Vermont	2.5
New Hampshire	2.4

For the United States as a whole the export dependency ratio was 6.4 in the same year. We cannot be too definitive here until we know more about exports by major commodity groupings. Nevertheless, there is a strong suggestion that many Northeast food manufacturing firms could do a better job of developing and exploiting foreign markets.

Internationalization of the food industry will continue as people increasingly travel abroad, as global communications systems bring foreign consumers closer together, and as businesses increasingly involve themselves in international activities. All this will create a market for new food products from foreign lands so that extension of shelf life for fresh and processed foods via such technology as aseptic packaging and irradiation will provide an economical way to meet these opportunities.

Fragmentation of the Food Market

Cox and Foster argue that ". . . markets are more fragmented than ever before, and thus it is more difficult for businesses to track trends; but it is more important that they do so. [This fragmentation] creates problems but also opportunities, since product needs will become increasingly more specialized." Increased demand for convenience foods and away-from-home eating, the graying of America; the increasing Hispanic population; the increasing incidence of single-individual households; more male shoppers who tend to be convenience conscious in their shopping habits; all contribute to this fragmentation.

The issue here is will the smaller, Northeast food manufacturing firms be able to find the new market "niches" in this fragmented system or will the larger firms take the new markets? Will competition be enhanced or reduced? If enhanced, in which distribution channels and which sectors? New technologies promise lower cost raw materials and innovative new finished products with longer shelf life. Will the firms that adopt these new products gain such a hold over the competition that concentration increases?

Market Coordination and Thin Markets

These are rather elusive subjects that have been treated at length by various authors including those associated with the NC-117 project (see Connor et al.). They can be expected to remain important topics for the Northeast food marketing system.

Basically the issue is: How are quantities produced and marketed to be coordinated—through an open market system, through contractural ar-

rangements, by institutions such as marketing orders or agricultural cooperatives, or via vertical integration. Does it matter? Should additional institutions be invented or implemented as subsectors evolve toward less dependence on price as the coordination device or as a smaller volume of the product is traded on open markets?

The issue here is well articulated in the ESCOP report on Research and Agricultural Marketing (Babb et al., p. 13).

> Larger, more specialized food processing and distribution systems have exerted more stringent demand on the marketing system as the costs associated with uncertain product volumes, quality, or price levels have increased. At the same time, there have been pressures to reduce the costs of individual market transactions. These forces have led to an evolution in the kinds of pricing and coordination systems used in a wide array of commodity markets. There has been growth in geographically dispersed, direct-spot marketing arrangements between local producers and processors, in longer-term production or marketing contractual arrangements, in marketing through cooperatives, and in vertical integration. As a consequence, the product volume moving through more traditional systems, like terminal markets, has declined, leading to thinly traded markets. As markets become thinly traded, concerns grow about the adequacy of market outlets or supplies, market liquidity, price volatility, and price manipulation. Since institutional arrangements can have significant impact on the way resources and income are allocated in the food and agricultural sector, they have frequently been the focus of controversy in industry, the Congress, and the courts.

Significant questions here include: How much trading volume is sufficient to produce accurate and equitable prices? Under what structural conditions is price manipulation feasible and likely? Can market paricipation be expanded by introducing new or improved institutional arrangements? Would more comprehensive reporting of the terms of trade from all competing marketing systems be essential? What new institutional framework is necessary to achieve the desired amount of market information?

Mergers

Meager activity among American businesses is once again in the news. Mergers in the food manufacturing industries are concentrating the ownership of firms producing branded consumer products into a much smaller number of firms. Much of the food manufacturing activity in the Northeast is in branded products; hence, mergers are of considerable concern in this region.

The large conglomerates that result from mergers make it much more difficult for the smaller independent food processors to compete. Further they are large enough to command an input supply from outside the region at the expense of local production. The motives for, and full effects of mergers are not yet completely understood. Gisser seems to be little concerned about the development of large conglomerates in the food industries. Others see them resulting in increased market power, market restructuring aimed at reducing competition, massive advertising campaigns designed to differentiate products, and suppression of information about the industry (see, for example, Mueller).

Relation Between Farm Structure and Food Processing Structure

As the number of local processors of farmers' produce diminishes, we might expect a corresponding diminution in the number of local first handlers of farmers' produce. This in turn might lead to the expectation that as the number of food processing establishments decline in the region, the number of farms will also decline. Of perhaps greater significance is the fact that many of today's processing establishments are part of national or regional firms producing branded products. Such firms typically do not rely on any one production area for their raw materials; rather they obtain their supplies anywhere they can get the volume necessary to support a nationwide or regionwide marketing and distribution program. Thus even though an area's basic resources will support agricultural activity X and even though there are local facilities for processing the produce of activity X, the volume of production in the area may not be sufficient to satisfy local processors' needs. Under such circumstances farmers will have difficulty in marketing their produce if they can market it at all.

Given the low density of production in some areas of the region and in some commodities, all this is of major concern and importance to Northeast researchers and policy-makers. It certainly conditions the marketing activity of existing farmers and processors. It also limits the kinds of adjustments that farmers can make given the existing structures in the region.

Earlier research (Hallberg) has established a clear relationship between changes in farm numbers and changes in numbers of processing establishments in the Northeast. Unfortunately this work has not yet been pushed far enough to establish clear causal relationships. Further, much work remains to be done in cataloging the low density of production areas, determining what limits to adjustments exist in these areas, and establishing what new market-

ing and/or input supply institutions are needed in these areas.

Implications

The issues discussed in this paper are suggestive of many future research efforts. For example, we need to continue our efforts at isolating the impact of generic advertising on food consumption and, in general, to determine whether or not additional advertising pays. Given the current uncertainty in the profession about the response of consumer demand to advertising, farmers are being asked to go quite far out on the limb in voting for check-off programs. Perhaps we should simply admit our uncertainty here and provide aggregate cost-benefit ratio estimates based on various *assumed* farmer check-off levels and *assumed* response-to-advertising impacts. This might provide a greater range of information (even if not certain knowledge) than farmers currently have available about the subject.

In the area of international trade in value-added products, I concur with the ESCOP Committee on Research and Agricultural Marketing (Babb et al.) who called for more research on: (1) estimation of the potential growth in consumption in foreign markets for both agricultural commodities and value-added products, which involves identification of constraints to achieving that growth and determination of the most cost-effective methods to expand market demand, (2) development of new product forms and processing and merchandising methods that can enhance the ability of U.S. producers and processors to compete more effectively in export markets, and (3) analysis of the impact of trade barriers and institutional factors that act as constraints on trade and development of new strategies to overcome those constraints.

In the area of market coordination and thin markets, considerable research is called for in determining resource allocation signals that result from production and marketing contracts with varying specifications or from cooperatives with varying patronage refund and pricing policies. We also need to study in detail the questions surrounding thin markets, to determine if new institutional arrangements are needed and viable, to determine the implications of lack of production density, etc. Of the coordinating mechanisms presently in use, one of the least understood are production contracts used extensively in the vegetable area. What are the terms of the contract, how are these terms set, how much negotiation is permitted, etc.? All this is particularly relevant in the Northeast where crop production is small relative to national totals and the demands of handlers, and where there are so few handlers.

Overall, the productivityand efficiency of the U.S. food and fiber system beyond the farm gate could be greatly enhanced through a research program designed to yield new technologies, evaluate the feasibility of alternative systems, develop strategies for industry adoption of low-cost options, and analyze alternative public policies to promote productivity and efficiency. The econometric work of Heien, Polopolus, Lee and probably others is very impressive and useful. It doesn't get us very far in terms of solving the basic problem, however. Perhaps our job is to merely point out the problems and then try to encourage the industry to solve these problems with their own expertise. Casual observation as well as a study of the trends in marketing research expenditures of late will suggest that the profession believes it should engage in less research designed to help processing firms improve their economic efficiency. Is this what we want to see happen? Will the industry fill the void left by the profession?

A final subject that merits consideration concerns how the profession might best organize itself for future food marketing and distribution research. The ESCOP Committee on Research and Agricultural Marketing (Babb et al.) called for a National Food Commission; but, one devoted to work on international marketing of food and fiber. It also called for specialized regional research and education centers located strategically throughout the country and a national think tank on food and fiber systems in the USDA charged with integrating, coordinating, and conducting national and international studies not appropriate for regional centers.

I am in sympathy with the idea of regional centers as proposed by the ESCOP Committee. However, I am not hopeful that they will get organized and funded. Is the time ripe for another National Commission on Food Marketing? Such a Commission has certain attractive features, especially if it has a life long enough to accomplish well articulated goals. It would be national in scope rather than serving primarily regional issues. It would have easier access to data than other such institutions. It can serve a vital role in formulating research and policy priorities and in setting the future research agenda in food marketing and distribution. It could operate with a relatively small core staff supplemented by visiting scholars and contract studies. It could engage itself in basic descriptive studies, more basic research projects designed to

yield results relevant to food system performance, and organize national data bases that many individuals have from time to time suggested. This is not an idea to which everyone subscribes. Nevertheless, I think it is an issue that merits further thinking, particularly in view of the fact that no such organization now exists.

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