How Can Oklahoma Communities Attract Food Manufacturing Companies?

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Society as a whole has shown a growing desire for food items that, to some degree, have been processed to limit preparation time, increase the levels of favorable attributes, and/or ensure food safety. With its proximity to large market centers and abundant quantities of raw agricultural commodities, Oklahoma stands to benefit from increased in-state food processing activities. The state offers several positive factors, such as: (1) a central location in the continental United States, (2) a convenient interstate system (I-35, I-40, and I-44), (3) state tax incentives for "value-added" agribusinesses, and (4) existing large food manufacturers which have proven that Oklahoma is a good state for manufacturing and distribution facilities. Lopez Foods, Wortz Company, Bar-S Foods, Advance Foods, and Bama Foods are examples of major food processors providing the essential elements for both metropolitan and non-metropolitan economic growth in Oklahoma.

The primary purpose of this fact sheet is to provide knowledge about key factors affecting the location of *agribusiness* investment that could become the cornerstone for community economic growth. Findings from previous regional and national agribusiness studies are mentioned, but the greatest emphasis is placed on the findings from a recent survey of Oklahoma food manufacturers. These research efforts have pinpointed community characteristics deemed important by manufacturers. Understanding such characteristics allows a community to better market itself and helps communities and manufacturers determine a "best fit."

Site Characteristics Important to Manufacturers

States and their communities have a vested interest in determining what factors are important to all types of manufacturers. Successful recruitment of firms means positive impacts (i.e., economic growth) for both the community and the state. Communities interested in attracting particular kinds of firms can: (1) assess their current infrastructure and strengths; (2) invest in and develop the factors most likely to attract specific firms; and/or (3) market their community based upon the existing and developed desirable characteristics.

A recent edition of *Rural Conditions and Trends* focused on value-added manufacturing, specifically trends, workers wages, local linkages, exports, and the level of capital investment. One important observation stated in this edition was that farm (and forest-based) value-added industries have potential to bring jobs and income to rural areas that are endowed with agricultural and/or forest resources. Low labor costs and access to raw materials were noted to be attractive features for value-added processing firms, along with (sometimes) less stringent environmental regulations and lower taxes. Community leaders should be reminded that jobs in some value added industries are relatively low in skill and educational requirements.

Cleary, in a recent *Chilton's Food Engineering* article, pointed out that many stages are involved in making plant location decisions. Examples of determining factors examined in these decision stages were transportation and logistics, utilities and infrastructure, tax codes and incentive packages, and work force quality. Location is still a "key" initial factor according to Cleary. Thus, Oklahoma's central location offers a competitive advantage. Other factors, such as taxes and various incentives, are often the ones that "make or break" a deal in the later stages of site selection. Cleary also noted that local economic development groups can offer valuable assistance or information throughout the process, providing both a true representation of local/regional business climate and a sign of interest in attracting manufacturers.

Area Development, a national location and site selection trade magazine, contacted several U.S. manufacturers and asked them to rank specific site or location decision factors. Some factors, listed in order of importance, included (among others) labor costs, highway access, construction costs, availability of skilled labor, availability of telecommunications access, land availability, cost of land, and energy availability/cost. Some of these are consistent with this report's findings

for Oklahoma while others are not, once again stressing that the Area Development survey was a national study, including all types of manufacturers.

A recent *Plant Sites & Parks* article by Gallo-Torres noted that state and local governments have "upped the ante" for attracting manufacturers with financial incentives, and that "savvy business operators are learning to play bidding communities against each other." While these statements must be acknowledged, the author also notes that food companies cannot ignore traditionally important factors such as labor, plant flexibility, access to raw materials, proximity to customers, and the availability of water and/or waste water treatment facilities. The author concludes by stating that the bottom line in making site selections will be potential profitability and flexibility in today's economy.

On a more local note, Sloggett and Woods listed several factors that affect the ability of rural Oklahoma communities to attract new businesses and industry. One commonly overlooked element of industrial recruitment related to having an active and well-organized local economic development committee. Other factors were more tangible and related to a plant's ability to function, such as proximity of markets, local labor supply, access to raw materials, transportation infrastructure, an existing industrial site (park), adequate utilities, and financial capital.

In a related piece, Henneberry and Woods indicated that regional population growth combined with the state's primary agricultural outputs of livestock and wheat make food processing activities highly probable ways to expand and diversify Oklahoma's economy. For example, most of Oklahoma's large food processors manufacture products from wheat and/or meat for distribution throughout the Southwestern and Midwestern United States. The authors also suggest that, while the state's geographic positioning makes it a prime location for regional food manufacturers, the in-state economic structure and population makeup provide many opportunities for smaller processing businesses to develop.

These articles together suggest that there are numerous factors affecting firm location decisions, including:

- Access to raw materials
- Low labor costs
- Less stringent environmental regulations
- Lower taxes
- Transportation and logistics
- Utilities and infrastructure
- Land availability and cost
- Energy availability and cost
- Financial incentives
- Well organized and active local development committee
- Proximity to markets

However, all but one of these articles were either national in scope or not specifically related to food processing. To provide a better picture of food manufacturing needs and the ability of Oklahoma to attract processors, data directly reported by in-state food processors would provide specific and relevant information. This led to the survey of Oklahoma food manufacturers discussed in the next section.

Oklahoma Food Manufacturers and Location Factors

In the summer of 1997, the Food and Agricultural Products Research and Technology Center (FAPRTC) at Oklahoma State University surveyed Oklahoma food and agricultural products manufacturers. The survey was designed to gather information on each of these firms, including type of business, products manufactured and/or distributed/sold, types and sources of ingredients, annual sales, current capacity utilization, and number of employees. In addition, the survey requested that each manufacturer rate the individual importance of a list of location factors. These factors, which could be assigned a value of 1 to 9 (1 = "Not important", 9 = "Vital importance") included: 1) proximity to buyers/consumers, 2) established industrial zone, 3) labor supply, 4) waste disposal facilities, 5) transportation (rail, highways, etc.), 6) availability of adequate utilities, 7) supply/proximity of raw materials, and 8) community incentive programs.

Respondents supplied information on the importance of these location factors in determining business locations. The following sections discuss mean factor ratings from these respondents as segregated by the U.S. Department of Commerce's Standard Industrial Code (SIC) system, focusing specifically on 3-digit SIC categories. These codes represent classifications of business activities, whether or not they are involved in manufacturing. More digits in a code number represent a finer classification of business activity.

Table 1 depicts the number of survey respondents from each 3-digit SIC category compared to the number of establishments listed for each category in the 1995 *County Business Patterns* for Oklahoma. A large portion of the survey respondents represented SIC 201 (meat products) establishments. The values of combined factor importance ratings would have been skewed by this large number, hence the comparisons of factor ratings by 3-digit SIC as opposed to an overall SIC 20 grouping.

The mean importance ratings of location factors reported by all 3-digit SIC food manufacturing group are reported in Table 2. The numbers in parentheses represent the standard deviations among responses by each 3-digit category for each specified location factor. Because only one SIC 207 (Fats and Oils) processor

Table 1: Breakdown of Survey Respondents by 3-Digit SIC Classification, Compared with "County Business Patterns" Establishment Estimates for Oklahoma.

SIC Code	*No. of Survey Respondents*	*No. of Establishments in Oklahoma*[a]
201: Meat Products	33	60
202: Dairy Products	5	12
203: Preserved Fruits & Vegetables	12	21
204: Grain Mill Products	9	47
205: Bakery Products	6	16
206: Sugar & Confectionary Prod.*	8	5
207: Fats & Oils	1	9
208: Beverages	3	18
209: Miscellaneous	6	30

[a] Source: County Business Patterns 1995: Oklahoma (U.S. Bureau of the Census).
* These contradicting numbers result from the survey's inclusion of relatively new, small, candy and confectionary businesses, some of which did not exist in 1995.

responded to the survey, no statewide estimates of location factor importance are reported for that category.

SIC 201: Meat Products

Thirty-three of the 83 respondents fell into the category of meat products processors. These respondents represented an extensive meats processing range, from large manufacturers of processed and/or pre-cooked meat products to small packing houses that also market their own meat products. Their diversity resulted in a broad range of location factor ratings, although some factors suggest a degree of greater importance.

Adequate utilities ranked as the most important factor across all SIC 201 respondents, with a mean rating of 6.93 (Table 2). In fact, utilities represented the highest rated location-determining factor for almost all 3-digit SIC classifications. Meat products processing typically requires a considerable amount of electricity to accommodate refrigerated storage of raw meat products and most finished products. Similarly, electricity and gas are needed to operate cutting and processing machinery, along with ovens and dryers. Additionally, the cleaning and sanitation of meat products processing

Table 2: Importance Ratings[a] of Specific Location Factors by Existing Oklahoma Food Manufacturers (1="Not Important," 9="Vital Importance").[b]

Type of Food Manufacturer[c]	*Proximity to Customers/ Buyers*	*Established Industrial Area/Zone*	*Labor Supply*	*Waste Disposal Facilities*	*Transportation*	*Avail. of Adequate Utilites*	*Supply/Prox. of Raw Materials*	*Community Incentive Programs*
Meat Products	5.58 (2.37)	3.18 (2.14)	5.70 (2.28)	4.78 (2.72)	5.18 (2.72)	**6.94** (2.25)	**6.36** (2.67)	3.21 (2.55)
Dairy Products	**6.60** (3.58)	2.80 (3.03)	**6.00** (3.00)	**6.80** (2.05)	**6.20** (3.11)	**7.60** (1.14)	**6.00** (3.16)	2.80 (2.05)
Preserved Fruits and Veg.	4.50 (2.43)	3.75 (2.83)	**6.50** (2.31)	4.08 (2.57)	5.58 (2.39)	**6.67** (2.27)	**6.00** (2.17)	6.25 (1.96)
Grain Mill Products	**6.22** (2.54)	3.89 (2.52)	5.56 (2.30)	5.89 (2.47)	**7.44** (2.19)	**7.89** (1.69)	**6.78** (2.17)	4.56 (1.33)
Bakery Products	**6.16** (0.98)	5.16 (2.71)	**7.83** (1.60)	5.50 (2.81)	**6.33** (2.94)	**7.33** (1.63)	**7.00** (1.41)	5.67 (3.44)
Sugar & Con fectionary	**6.13** (2.10)	2.38 (0.92)	5.88 (3.04)	3.63 (1.92)	**6.50** (2.39)	**8.00** (1.20)	**6.88** (1.96)	4.63 (3.16)
Beverages	5.67 (4.16)	3.00 (3.46)	3.00 (3.46)	3.00 (3.46)	3.00 (3.46)	**6.33** (1.15)	**8.33** (1.15)	3.67 (3.06)
Miscellaneous	4.50 (1.22)	2.33 (1.51)	4.67 (3.14)	4.50 (2.95)	5.50 (3.21)	**7.00** (2.53)	5.17 (3.13)	4.00 (2.76)

[a] Numbers in parentheses represent standard deviations for responses to each question by each specified food manufacturing segment.
[b] Numbers in bold represent average rating of 6.00 or greater, indicating some importance of that factor to that particular industry.
[c] Manufacturers were divided according to the U.S. Dept. of Commerce Standard Industrial Code (SIC) system to the 3-digit level: 201-206, 208, and 209.

establishments requires extensive amounts of heated water, once again relaying the importance of adequate utilities.

The only other factor with a mean rating greater than 6 was availability of raw materials. Oklahoma produces vast quantities of cattle and hogs each year, and many small packing houses depend upon local production for slaughtering activities and for providing the inputs (ground beef, trimmings, etc.) for their own products. Hogs constitute a growing segment of the state's agricultural production and food processing activities, primarily in the Panhandle area. In addition, the eastern part of the state has seen growth in the areas of integrated poultry production and processing.

SIC 202: Dairy Products

Five respondents to the survey section on location factors were manufacturers of dairy products. Like SIC 201 establishments, SIC 202 establishments indicated that adequate utilities were extremely important, giving that factor a mean rating of 7.60. Much like meat products processing, dairy products processing requires high quantities of electricity and/or gas for heating and cooking. Maybe even more so than meat products, dairy products processing requires extensive amounts of water, not only for cleaning and sanitizing facilities, but also for cleaning out product flow lines.

The second most important factor, in terms of mean ratings, was the availability of adequate waste disposal facilities (mean rating of 6.80). The high water usage associated with dairy products processing requires that municipal waste facilities be able to handle a considerable volume of waste water. Not only is this an issue when such a facility enters a community, but consideration has to be given to the community's waste handling ability assuming future growth of the dairy products processor and the community itself.

Another high-rating factor was the proximity to buyers/customers, with a mean rating of 6.60. Due to the perishability of dairy products such as milk, cream, butter, and ice cream, it is common for both dairies and dairy products processors to locate near market centers. Also, the high weight-per-unit ratio of these dairy products results in higher transportation costs, making proximity to customers even more of a cost management factor.

SIC 203: Preserved Fruits and Vegetables

While the 12 fruit and vegetables processors that responded to the survey also rated utilities as the most important factor (6.67 mean rating), the availability of labor came in a close second with a rating of 6.50. Fruits and vegetables are labor-intensive farm items, but the hands-on preparations necessary for further processing also make horticultural products labor-intensive at the processing stage. Culling and sorting are two major labor activities associated with SIC 203 processing, and extensive labor is often necessary to ensure product flow even in highly automated establishments. This is especially true for smaller establishments that lack high levels of technological and mechanical advancement.

Unlike most other food processing activities, the SIC 203 respondents reported that incentive plans offered by Oklahoma communities played an important role in their location decisions, as indicated by a mean rating of 6.25. This rating was slightly above the 6.00 for proximity of raw materials, a very important factor when one considers the significance of timely delivery of fresh fruits and vegetables to processing activities. For most horticultural crops, delivery time and distance are crucial for getting fresh fruits and vegetables to a processing facility for freezing, canning, drying, etc. For some fruits and vegetables, a few hours mean the difference between preservation and spoilage.

SIC 204: Grain Mill Products

Cereal grains typically require some milling or grinding activity before the grains are used in processed foods for human consumption and/or feed items for animals. Flour milling and flour products blending are high volume, low per-unit-profit businesses, so it is no surprise that transportation (7.44) rates right behind adequate utilities (7.89). These businesses require constant inflows and out-flows of grain and flour products, calling for a continuous flow of trucks, trains, and/or barges.

The SIC 204 establishments responding to this survey also gave high ratings to the proximity of raw materials (6.78) and proximity to buyers/customers (6.22). Because of the transportation needs of these businesses, costs can be minimized by locating near an abundant supply of raw materials (grain for flour milling companies, flour mills for companies making mixes and dough products from purchased flour) or near market centers (which may be feedlots or areas of high livestock production for feed mills).

SIC 205: Bakery Products

Oklahoma is home to a few large baking establishments, many of which produce products for delivery across the South and Southwest. Unlike other SIC classifications, the SIC 205 respondents rated labor availability (7.83) as the most important location factor. Baking is often considered more of an art than a process, so knowledgeable laborers are necessary for efficient operations. Due to the use of large ovens in all baking operations, utilities were the second most important location factor (7.33) across all responding baking institutions.

Much like the grain mill products industry, proximity to raw materials (mostly flour) had a mean rating of 7.00 and transportation had a mean rating of 6.33. Commercial bakers (especially those using wheat flour) generally achieve superior baking performance from

flour that is not too "green" (milled less than a week ago) nor too "stale" (milled more than 4 weeks ago). Therefore, many baking institutions locate near their flour suppliers or near major transportation routes for quick and easy flour deliveries.

SIC 206: Sugar and Confectionary

With a mean rating of 8.00, the 8 responding SIC 206 establishments clearly indicated that utilities were of major concern. Access to raw materials, in many cases the pecans and fruits associated with certain candies and treats, also rated as an important factor (6.88). Transportation (6.50) also rated as a relatively important factor.

Unlike most of the other SIC groupings, being in or near an established industrial zone (2.38) had almost no impact on the location decisions of these businesses. Also somewhat surprising, on the average these establishments placed less importance on local waste disposal facilities (3.63) than any other 3-digit category. This may be an indication that the respondents were smaller, less commercialized businesses.

SIC 208: Beverages

Three beverage bottling establishments responded to the location factors section of the food industry survey. Oklahoma has relatively few beverage companies, but these three overwhelmingly rated access to raw materials as their most important location factor (8.33). Coming in a distant second was access to adequate utilities (6.33), the only other factor with a mean rating higher than 6.00.

Beverage bottling, especially for soft drink products, usually takes place near customer centers. Most often, concentrated drink syrups are shipped to bottling centers, where water and carbonation are added before bottling, greatly reducing the costs of shipping bottled drinks from the location of the syrup manufacturer to market centers (less weight and volume to transport over long distances). Therefore, the proximity to a syrup supplier is important. However, alcoholic beverage manufacturing often requires that the inputs, grapes in the case of wine, be almost immediately available.

SIC 209: Miscellaneous

Encompassed in SIC 209 are food and kindred products not elsewhere listed, such as canned and cured fish and seafood items, roasted coffee, potato chips and similar snacks, manufactured ice, macaroni and spaghetti, etc. Due to the variability in this category, it becomes difficult to assess which location factors are important to any particular manufacturing activity falling under the SIC 209 heading. However, it was apparent that utilities (7.00) remained an important consideration for all of these miscellaneous manufacturers.

Important Factors Across Food Manufacturing Categories

One very evident finding from the survey is that different location factors are important to varying degrees for different food processors. Each 3-digit SIC category under the general classification of SIC 20 faces different manufacturing conditions and cost structures, thus each category's constituents have different ideas of factor importance. Some factors tend to be important across all industry categories, while others are important to specific sub-sectors.

The availability of adequate utilities (to support both the needs of the community and the needs of the processor) was consistently pinpointed as a highly important factor by the various food manufacturers. Given the heavily automated and technologically advanced state of modern processing, this comes as no surprise. Electricity, natural gas, and water are essential for almost all food processing activities, and mass production demands that each be available in large volumes from the communities in/near which manufacturing establishments locate. Also, when considering the amount of cleaning and sanitizing required by food manufacturers, the ability of a community to handle waste products and waste water becomes a key issue. Not only must utilities be adequate at the time of a manufacturer's decision to locate in a given community, but consideration must also be given to the adequacy of those utilities for the future growth of the community's population and manufacturing establishments.

For most of the survey respondents, the supply of and proximity to raw materials (inputs/ingredients) was an extremely important factor. This is also related to the mass production aspect of food manufacturing. Profit margins on processed food items are generally low to maintain competitiveness, so volume of production becomes a key issue for increasing overall profits and returns on investments. For this reason, the availability of large quantities of raw inputs often becomes a crucial factor in determining the optimal location for a processing facility.

Proximity to buyers/customers and transportation were important location factors for those manufacturing dairy products, grain mill products, and bakery items. Consumers of these products are greatly concerned with the perishability and freshness of these products, therefore manufacturers consider the timeliness of product delivery to maintain freshness and limit perishability. Also related to the importance of transportation, raw milk and grains/flour shipped to these manufacturers also take place in a timely manner to prevent a loss of freshness and spoiled inputs. Because these items are delivered in bulk and are often difficult to handle, transportation availability (ability to receive trucks, rail cars, and/or barges) becomes a key factor for these industries.

The availability of an adequately sized and skilled labor supply was important to dairy products processors, fruit/vegetable products processors, and bakers, most likely due to the extensive product preparation and handling needs associated with these products. Only dairy products processors rated the availability of adequate waste facilities as being an important location factor, while only preserved fruits and vegetables processors listed community incentive programs as being a key factor in their location decisions. Surprisingly, having an established industrial zone was rated fairly low by the responding establishments.

Conclusions

These findings provide greater insight into the importance placed upon location factors by food processors in Oklahoma. Potentially, communities interested in attracting specific kinds of firms could invest in and develop factors deemed important by those firms. Alternatively, communities could assess their current infrastructure without development and market their community's strengths to firms that desire those characteristics.

Additional information on food manufacturing and the importance of location factors may be obtained by contacting the Oklahoma Food and Agricultural Products Research and Technology Center (at OSU), the Oklahoma Department of Commerce, the OSU Department of Agricultural Economics, and/or the Oklahoma Department of Agriculture. Community leaders and economic development directors interested in further researching the impacts of various factors on the location decisions of manufacturers may wish to review the following articles/reports (many of which were referenced in this fact sheet):

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- Economic Research Service, U.S. Department of Agriculture, Rural Conditions and Trends: Rural Industry Issue, Volume 8, Number 3, March 1998.
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