Executive Summary
Pork Production in South Central Minnesota

The focus of those involved in this study is two fold: 1) To provide local industry with the number and type of employees they need to meet their production needs and 2) To ensure that there will be good paying jobs available for the individuals we assist to find employment or obtain training.

The skills learned as a result of our cursory study of the pork industry will be beneficial in our continuing work with this industry as well as others. The skills gained will help us promote and maintain the economic conditions that may help new clusters emerge and provide the employment, training and economic development policy makers who attended, a set of skills that can be used to identify and analyze other industry clusters and make our findings available to the staff responsible for economic development and training activities in our area.

It is better to work with groups of firms on common problems (such as training or industry expansion) than to work with individual firms. It can help a policy maker to build on the unique strengths of their region vs. trying to be like other regions. Beyond the identification of strengths, challenges and needs, there must be continuing dialogue. Public sector policy makers can play a central role in convening cluster members/groups, and supporting whatever directions it makes sense for them to take.

To help us get a feel for the pork production cluster in our area, interviews were conducted with Ag Star, Christensen Farms, Prairie Pride, Precision Pork, Minnesota Pork Producers and Famous Dave’s.

Christensen Farms began in the 1970s as a FFA project for three brothers who lived on a farm near Sleepy Eye and who received a pair of bred gilts from a neighbor who wanted to encourage their entrepreneurial spirit in livestock production. By their high school graduation, they had grown those two gilts into a 140 head farrow-to-finish operation. They have been active in the pork industry for more than a quarter of a century, dedicated to delivering the highest quality, safe and consistent meat products to the consumer market. They continue to be a growing, profitable organization with an evolving focus as a food company that is constantly innovating and challenging conventional thinking in the swine industry. Today they have become the largest family-owned swine business in the U.S., with 170,000 sows and 1200 employees located in six states. They collaborate with nearly 450 farm families (independent contract producers) to raise high quality pork products. Christensen acquired Triumph Foods where they process fatter hogs to meet the demands of the Japanese market.

Prairie Pride, a fourth generation farm, is a classic example of an entrepreneurial enterprise that has taken full advantage of the input variables in its cluster. When they first started out they took full advantage of the educational opportunities in the area, attending classes in direct marketing at the University of Minnesota, classes sponsored by Land O Lakes and took advantage of the services of SCORE who helped them build their image as an environmentally sound, small family farm that provides a natural alternative to the “super market” product. To get their product into the market place, they started by a call to the Mankato and St. Paul Farmers’ Markets to see if they could sell pork there. They used a local meat processor to process their foods. The butcher there had experience in direct marketing with other farmers and helped them with packaging and portion selection. Because they raised Berkshire hogs, a fatter breed, they soon discovered that they could successfully market their “natural”, “tastier” product to niche markets.

Precision Pork is a sow gestation farrowing operation, involving 6 owners owning shares of the operation. Precision Pork deals only in iso-pigs (baby pigs). After the pigs are born and ready to move to the finishing stage, each owner receives back a number of pigs on a rotating basis based on the number of shares they own in the business. Each partner decides independently what they will do with the pigs they receive. Some sell to other farms for finishing, some do that themselves. One shareholder has a five year contract with other farms for a set number of pigs on a pricing matrix.

Ag Star is a farm financing institution. The Mankato location is the headquarters because it is a regional hub. They have $3.2 billion in loans and leases. They serve 60% of the top 30 swine producers in the United States. Other Ag Star branches can be found in Blue Earth, Worthington, Rochester, Apple Valley, St. Cloud, North Branch, Duluth, and Glencoe. They also have branches in Wisconsin at Baldwin
and Rice Lake. They provide 19 or 20 services including financing and leases, life insurance, appraisal services, tax record keeping, tax preparation and succession planning. Ag Star finances food processing, ethanol plants, bio-diesel plants and growers.

Famous Dave’s “Real Honest Barbeque”, started in Hayward Wisconsin, but the majority of their restaurants are located in Minnesota. The Mankato facility opened in July, 2006. Corporate headquarters are located in Minnetonka, Minnesota. They have 151 franchises located throughout the U.S. Twenty-five new restaurants are scheduled to open in 2007. On an average Saturday night, 5,120 lbs of ribs are consumed. That equates to 64 pigs! On a weekly basis, 720 lbs of pork butt and shoulder are used.

**Diamond of Competitiveness**

Our south central Minnesota pork production cluster diamond presents a robust cursory analysis of a strong industry that is both mature and presented with many opportunities for growth.

**Factor (Input) Conditions**

There are a number of input factors that contribute to the success of this industry: financing is an integral component of the pork production industry. The services available for pork producers related to finances are very broad, ranging from assistance with daily management to long-term planning. Animal research has had the greatest impact in the past 10-15 years. Improvements in genetics, animal husbandry and disease management have raised the quality and quantity of hogs produced each year. Human resource needs and skill requirements continue to evolve, requiring retraining and skill updating. The regions natural resources are well designed for the growth and management of the pork production industry cluster. Southern Minnesota has a strong history in agriculture and pork production. The region’s culture has strong ties to farming through all of the immigrant families that settled in this area. Hogs are transported between facilities for weaning, farrowing and processing, making transportation a key condition. The region’s pork production industry is supported by two types of education: agri-management and animal research.

**Context for Firm Strategy & Rivalry**

Niche markets are being created as the pork production industry continues to mature and find additional markets. With the development and growth of breeding and genetics programs, pork producers can utilize the techniques to further distinguish their production processes on a global, regional or local strategy level. Methods of fertilizing crops for pork production feed continue to evolve. The Bio-medical application of hog tissue is an emerging industry strategy. Hog waste is also being considered as a potential source of alternative fuel. The pork producers in the region take a very proactive approach to dealing with environmental issues. Evolving partnerships and cooperative agreements that exist within the industry cluster is a sign of a mature cluster.

**Demand Conditions**

The demand for pork in the commodities market is tied to local processors, global processors and medical application. Product markets for pork production include local consumers and global consumers.

**Related & Supporting Industries**

A series of industries provide support as well as challenges for the pork producers. These industries include trucking, feed milling, bio-medical, grain farming, trade associations, alternative energy, veterinary services and ag equipment and supplies.

**Chance**

The single most important “Chance” factor within the pork production, and all ag related industries, is the weather. It is the one thing that no farmer can control.

**Government**

The hog production industry in Minnesota primarily interacts with government on regulatory issues that include feedlots, the environment, food quality, safety inspection and import/export policies.
Value Chain

Our study revealed two types of Pork Producers: The Broad/Global Market producer and the Niche market operating primarily at the local level and serving a specific market need. The value chains created for each, identify those conditions/variables and efficiencies that contribute positively to the industries bottom line. Key differences exist in the areas of inbound and outbound logistics, operations and marketing which contribute to the value chain and bottom line of both types of producer.

Pork Industry Cluster

Cluster strategies have become a popular tool for economic developers and local policymakers. An industry cluster is a group of firms, institutions and entities that are located in close proximity and benefit from their connections. They have common strengths and needs. Analyzing these “clusters” can help to diagnose an industry or an entire region’s economic strengths and challenges and can set a path for the industry or region’s economic future. A cluster chart combines the attributes of a flow chart and an organizational chart, showing relationships in the process as well as direct and indirect relationships.

In the pork industry, the indirect inputs include: banking and finance, management consultants, business consultants, trade associations, research, post secondary institutions and government. Direct inputs include feed suppliers, farrowing operations, veterinary services, artificial insemination, manure management, transportation/delivery, building construction/utilities, farm equipment dealers, sanitary supplies, and rendering. The outputs include: bio-medical, fertilizer, processing, skills/knowledge, health care, meat products, customer direct sale, retailers, global markets, alternative energy, pet food, and leather. The relationships of each of these factors are shown in the cluster map.

Action Plan:

- Presentation to the South Central WorkForce Council’s WorkForce Development Committee and full Council
- Presentation of report to contributors
- Partner discussion and the application of skills gained to other industries
- Inform post-secondary schools of training needs/issues.
- Further study of manure use as an alternative fuel
Pork Production in South Central Minnesota
An Industry Cluster Report

The State of Agriculture in Minnesota

Agriculture continues to play a major role in the economy of Minnesota. The following facts indicate its strong force in the economy, both domestic and abroad:

- The combined agriculture industries account for 17% of the state’s gross product.
- Agriculture and the food industry account for 20% of the state’s employment.
- In 2002, Minnesota exported over $2.2 billion, making it the 7th largest agricultural exporting state in the country.

Minnesota holds the following U.S. rankings for agriculture production:

- 1st in sugar beets, turkeys, sweet corn, and green peas for processing;
- 2nd in spring wheat, canola, wild rice, and oats;
- 3rd in soybeans, hogs, flaxseed, and American cheese;
- 4th in corn, sunflowers, edible beans, mink pelts, and total cheese;
- 5th in milk cows, barley, and honey.

The State of Pork Production in Minnesota

According to information found at the website of the Minnesota Pork Board and provided by the Minnesota Pork Association, in 2005, Minnesota hogs ate 157 million bushels of corn, and 57 million bushels of soybeans. Each hog consumes 3.8 bushels of soybeans in its lifetime. The soybeans are converted into soybean meal, which is an ideal feed for swine because of its high protein content. The average pig will also consume 10.5 bushels of corn in its lifetime. Feed is the major production input to the pork production process. In fact, feed usually accounts for 60-65 percent of all production expenses. The average whole-herd feed conversion ratio (pounds of feed required per pound of live weight produced) for the U.S. pork industry is about 3.2 to 3.84 and is getting lower (lower is better in this instance). The best U.S. swine herds have whole-herd feed conversion ratios under 3.0.

The 11-county south central region accounts for 54.2% of all pork production in Minnesota. The total gross income from all pork production in the region is over $1.58 billion, annually. Hogs raised for pork production consume almost 67 million bushels of corn each year, which equates to ~ 6% of the total corn produced in the state. The total estimated annual economic impact of pork producers in the region is $4.4 billion.

In addition to the families that live and work on Minnesota pork farms, there are 22,550 residents who depend on pork producers for their employment. These jobs include swine management and care, meat processing, construction and related building fields, trucking, animal nutrition, and feed mill operations. Minnesota pork producers generate both direct and indirect income into the state’s economy. Minnesota pork producers earned $2 billion in on-farm, gross income from marketing their pigs in 2005 and generated another $5.6 billion in economic activity for the state. Nationally, Minnesota ranks third in hog production. In 2005, Minnesota pork producers marketed 15.1 million hogs, an increase of about 3.5 million head since the year 2000. Minnesota Agricultural Statistics Service estimates that there are 5,000 Minnesota farms with one or more head of swine. The Top Ten Pork Producing Counties in Minnesota in rank order are: Martin, Blue Earth, Nobles, Brown, Nicollet, Mower, Freeborn, Jackson, Rock, Pipestone and Watonwan. Fifty percent of those counties are located in the South Central Minnesota Region 9 area.1

Overview of Region

The South Central region of Minnesota, also known as Economic Development Region 9, encompasses nine counties: Blue Earth, Brown, Faribault, LeSueur, Martin, Nicollet, Sibley, Waseca and Watonwan.

1 Minnesota Pork Board Website: http://www.mnpork.com/aboutminnpork.php
The regional labor market is characterized by a solid industry base, built largely on manufacturing, healthcare/social assistance, and retail trade. Together these three industries account for just over half of private employment and payroll wages in the region.

**South Central Economy**

The nine counties in South Central Minnesota experienced small employment declines during the recession and subsequent recovery. In 2004, those job losses appeared to level off, and the region started to see modest increases in overall employment. Some of the largest gains from 2003 to 2005 were in healthcare/social assistance, wholesale trade, finance & insurance, and manufacturing. During this period, the agriculture industry experienced a job growth of 4.6%; an increase of 102 jobs.

In 2005, the region’s top-employing private industries were manufacturing, healthcare/social assistance and trade (wholesale & retail). Agriculture employment of 2,326 constituted 2.6% of total employment in the region. However, these estimates do not accurately reflect regional agricultural employment since most farmers are self-employed and not included in payroll statistics. *DEED, Labor Market Information Office, QCEW*

**2005 SC MN Largest Employment Sectors**

Manufacturing, 25%
Wholesale & Retail Trade, 19%
Health Care/Social Asst, 16%
Hospitality, 9%
Construction, 5%
Finance/Ins., 4%
Information, 3%
Transportation, 3%
Adm/Waste Serv., 3%
Agriculture, 3%

*Source: DEED, Labor Market Information Office, QCEW*
In addition to the overall size of industry employment, we can also look at the concentration of industry employment to identify industries in which the region specializes or has a competitive advantage. One such measure is the local share of statewide industry employment. South Central employment accounts for four percent of total employment in the state, but several industries employ a larger than average share of statewide industry employment. The most notable example is the animal production industry, where the region holds a quarter of all the state’s jobs in this industry. The figure below shows those “distinguishing industries” that account for more than five percent of statewide employment in that industry.

Regional Distinguishing Industries (>5 percent): South Central

<table>
<thead>
<tr>
<th>Industry</th>
<th>Share of Statewide Industry Employment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Animal Production</td>
<td>25.3%</td>
</tr>
<tr>
<td>Printing and Related Support Activities</td>
<td>13.7%</td>
</tr>
<tr>
<td>Food Manufacturing</td>
<td>11.7%</td>
</tr>
<tr>
<td>Publishing Industries</td>
<td>7.7%</td>
</tr>
<tr>
<td>Nonmetallic Mineral Product Manufacturing</td>
<td>7.6%</td>
</tr>
<tr>
<td>Transportation Equipment Manufacturing</td>
<td>7.3%</td>
</tr>
<tr>
<td>Truck Transportation</td>
<td>6.6%</td>
</tr>
<tr>
<td>Telecommunications</td>
<td>6.5%</td>
</tr>
<tr>
<td>Merchant Wholesalers, Nondurable Goods</td>
<td>6.3%</td>
</tr>
<tr>
<td>Plastics and Rubber Products Manufacturing</td>
<td>6.1%</td>
</tr>
<tr>
<td>Nursing and Residential Care Facilities</td>
<td>5.9%</td>
</tr>
<tr>
<td>Heavy and Civil Engineering Construction</td>
<td>5.8%</td>
</tr>
<tr>
<td>Social Assistance</td>
<td>5.6%</td>
</tr>
<tr>
<td>Total, All Industries</td>
<td>4.0%</td>
</tr>
</tbody>
</table>

Source: DEED’s Quarterly Census of Employment and Wages (QCEW).

Several of these distinguishing industries also show a higher concentration of employment locally than is true nationwide. Calculation of a “location quotient” identifies industries that may have some competitive advantage as being those that have a location quotient greater than one. Comparison of employment change over time shows whether those location quotients got larger or smaller—essentially whether the industry is gaining or losing its competitive position. The exception may be those industries for whom their larger than average decrease in employment actually increased their competitive position. Also note that while location quotients will get larger if gains in the industry locally are greater than gains nationally, they will also grow if local losses are smaller than national losses.

The figure below classifies distinguishing industries by both the size of their location quotient (greater than or less than one) and by whether it grew or got smaller in recent years. All of the distinguishing industries shown below have at least average or higher concentrations of local industry employment as measured by their location quotient in 2001, and the vast majority increased their location quotient over time.
Animal Production Employment in South Central Minnesota

The Animal Production industry adds almost 2,000 jobs to the South Central Region. Employment change within the industry has been mixed, with employment increases in Hog/Pig Farming and Dairy Cattle/Milk Production, and decreases in Poultry/Egg Production. Between Second Quarter 2001 and Second Quarter 2004, regional animal production employment grew by about 10 percent (183 jobs)

Within Animal Production, the largest employment is in hog and pig farming; an industry that added almost 200 jobs in recent years. The second largest animal production industry is poultry and egg production, which has lost jobs recently.

Animal Production Employment in South Central Minnesota

<table>
<thead>
<tr>
<th>Industry</th>
<th>Q2 2001 Employment</th>
<th>Q2 2004 Employment</th>
<th>Percent Employment Change</th>
</tr>
</thead>
<tbody>
<tr>
<td>Animal Production (NAICS 112)</td>
<td>1,763</td>
<td>1,946</td>
<td>10.40%</td>
</tr>
<tr>
<td>Hog and Pig Farming (NAICS 1122)</td>
<td>1,042</td>
<td>1,239</td>
<td>18.90%</td>
</tr>
<tr>
<td>Poultry and Egg Production (NAICS 1123)</td>
<td>NA</td>
<td>NA</td>
<td>Declined</td>
</tr>
<tr>
<td>Dairy Cattle and Milk Production (NAICS 11212)</td>
<td>NA</td>
<td>NA</td>
<td>Increased</td>
</tr>
</tbody>
</table>

Source: DEED Quarterly Census of Employment & Wages: www.deed.state.mn.us/lmi/tools/qcew
Selection of Pork Production Industry

Upon review of the labor market information, our team chose to focus our study on the pork production industry in South Central Minnesota. This was based on Animal Production having the highest location quotient (11.61), the increase in quotient over time (increased 5.5% from 2001 to 2004), and that pork production constitutes two-thirds of animal production employment.

<table>
<thead>
<tr>
<th>NAICS</th>
<th>Industry</th>
<th>2001 LQ</th>
<th>2004 LQ</th>
<th>% LQ Change</th>
<th>2004 Employment</th>
</tr>
</thead>
<tbody>
<tr>
<td>112</td>
<td>Animal Production</td>
<td>11.00</td>
<td>11.61</td>
<td>5.5</td>
<td>1953</td>
</tr>
<tr>
<td>323</td>
<td>Printing &amp; Related Activities</td>
<td>7.04</td>
<td>7.78</td>
<td>10.5</td>
<td>4127</td>
</tr>
<tr>
<td>511</td>
<td>Publishing Industries</td>
<td>2.46</td>
<td>2.56</td>
<td>4.1</td>
<td>1871</td>
</tr>
<tr>
<td>623</td>
<td>Nursing &amp; Residential Care</td>
<td>2.18</td>
<td>2.23</td>
<td>2.4</td>
<td>5046</td>
</tr>
<tr>
<td>327</td>
<td>Nonmetallic Mineral Product Mfg</td>
<td>1.52</td>
<td>2.17</td>
<td>43.1</td>
<td>871</td>
</tr>
<tr>
<td>624</td>
<td>Social Assistance</td>
<td>1.51</td>
<td>1.87</td>
<td>24.3</td>
<td>3031</td>
</tr>
<tr>
<td>424</td>
<td>Merchant Wholesalers, Nondurable</td>
<td>1.70</td>
<td>1.83</td>
<td>8.0</td>
<td>2951</td>
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<tr>
<td>333</td>
<td>Machinery Manufacturing</td>
<td>1.34</td>
<td>1.57</td>
<td>17.7</td>
<td>1440</td>
</tr>
<tr>
<td>326</td>
<td>Plastics &amp; Rubber Products Manuf.</td>
<td>1.46</td>
<td>1.56</td>
<td>7.2</td>
<td>1013</td>
</tr>
<tr>
<td>517</td>
<td>Telecommunications</td>
<td>0.92</td>
<td>1.30</td>
<td>41.5</td>
<td>1079</td>
</tr>
<tr>
<td></td>
<td>Heavy/Civil Engineering</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>237</td>
<td>Construction</td>
<td>1.10</td>
<td>1.23</td>
<td>12.4</td>
<td>890</td>
</tr>
<tr>
<td>339</td>
<td>Miscellaneous Manufacturing</td>
<td>1.10</td>
<td>1.11</td>
<td>0.9</td>
<td>583</td>
</tr>
<tr>
<td>452</td>
<td>General Merchandise Stores</td>
<td>1.04</td>
<td>1.06</td>
<td>1.9</td>
<td>2439</td>
</tr>
<tr>
<td>522</td>
<td>Credit Intermediation</td>
<td>0.94</td>
<td>1.01</td>
<td>6.6</td>
<td>2278</td>
</tr>
</tbody>
</table>
SOUTH CENTRAL MINNESOTA PORK PRODUCTION CLUSTER DIAMOND

South Central Minnesota Pork Production Cluster

Chance
Weather

Context for Firm Strategy And Rivalry
“Niche” Markets
Breeding Programs
High Quality at Low Cost
Fertilizer/Manure Processing
Bio Medical /Alternative Fuel
Corporate & Global Competition
Environmental Friendly Initiatives
Continuous Improvement & Innovation
Partnerships & Cooperative Agreements

Demand Conditions
Commodities Market
- Local Processors
- Global Processors
- Medical Research
Product Market
- Local Consumers
- Global Consumers

Government
Food Quality
Safety Inspection
Regulatory Issues
Legislative Policies

Factor (Input) Condition
Finance
Animal Research
Human Resources
Natural Resources
Agricultural History
Transportation Systems
Educational Institutions

Related and Supporting Industries
Trucking
Feed Milling
Bio-Medical
Grain Farmers
Trade Associations
Alternative Energy
Veterinary Services
Ag Equipment & Supplies
Our south central Minnesota pork production cluster diamond presents a robust cursory analysis of a strong industry that is both mature and presented with many opportunities for growth. The following is a brief analysis of the four cluster components and the role of chance and government.

**Factor (Input) Conditions**

**Financing:** The services available for pork producers related to finances are very broad, ranging from assistance with daily management to long-term planning. This is reflected in the portfolio mix of one of the region's largest financial services company, AgStar. Their portfolio mix includes 50% long term investment in capital goods, 45% in short term investments for operational purposes and 5% leases for short-term capital goods. Ag Star has $3.2 billion in loans and leases and serves 60% of the top 30 swine producers in the United States.

**Animal research:** has had the greatest impact in the past 10-15 years. Improvements in genetics, animal husbandry and disease management have raised the quality and quantity of hogs produced each year. Historically, litter sizes have ranged between 4-6 per sow. Today, due to genetics and husbandry practices, it is not uncommon to see litter sizes as large as 10. Prior to the last 10 years, pork also had a reputation of carrying parasitical diseases that could be transferred to humans. Better herd management techniques have all but eliminated this issue.

**Human Resources:** Although production techniques have increased the efficiencies of pork production per labor unit, overall reducing the number of workers needed for a static sized feedlot, the continued overall growth in the industry requires more workers. Skill requirements also continue to evolve, requiring regular training and updating of skills. Positions such as agronomist, feed merchants, and buyers, need post-secondary education. Often producers will do their own training and have extensive training materials which detail all job functions. Minnesota State University, South Central Technical College, University of Minnesota, University of South Dakota, Iowa State University, Kansas State University, and University of Nebraska all contribute to production and professional training needs of the industry. Some hog producers have internship programs with local post-secondary schools in both Minnesota and Iowa. With potential market expansion in traditional and the new areas of bio-fuels and bio-medical applications, it is expected that this trend will continue. In general, producers are more concerned about the lack of good employees. They often compete with manufacturing for employees and are looking for “motivated” employees, with a good work ethic. It is difficult to find people who were raised on the farm that want to stay living and working on the farm and difficult to recruit “city dwellers” to live in small rural communities. They demand good working conditions, good pay, and health care benefits. Farm producers are looking for employees with a farm background. One producer is launching a new labor initiative that increases wages, reduces hours, and provides incentives and better health care.

**Natural Resources:** The region's natural resources are well designed for the growth and management of the pork production industry cluster. The most significant aspect of this region's natural resources is the soil. The soil make-up provides two distinct advantages to the pork production industry: corn and soybean production and waste compatibility for fertilizing. The soil produces a robust supply of corn and soybeans for hog consumption. This is highly critical because 60% of the cost for raising hogs is feed and the market demands that feed sources be located within 40-50 miles of the pork producers. The region's soil also provides a competitive advantage for managing animal waste. The soil is so receptive to manure as a fertilizer that it has become an asset to the pork producers. In most other parts of the US, manure is a liability to pork producers.

**Agricultural History:** Southern Minnesota has a strong history in agriculture and pork production. The region's culture has strong ties to farming through the immigrant families that settled in this area. The most prominent example is Hormel, located in Austin, Minnesota. They have just celebrated their 100th year of operations, starting first as a small butcher shop supporting small pork producers and growing to one of the largest processors of pork.

**Transportation:** The quality of the transportation system is critical to all aspects of pork production. Along with feed, hogs are transported between facilities for weaning, farrowing and processing. Because
the region’s climate includes freezing and thawing of the ground, road weight restrictions in the spring can cause issues. To address this issue, all pork production facilities are ideally located on roads with 10-ton ratings. It is very difficult to be successful in pork production if you operate near roads that have longer periods of weight restrictions every spring.

**Education:** The region’s pork production industry is supported by two types of education: agri-management and animal research. Local institutions offer a variety of training programs that support the advancement of pork production in all facets of operations. Local pork producers indicate a need for people with accounting and computer training. Other universities engage in animal research designed to continue to improve the genetics and to look at pork as a food sources for addressing human diseases and pork-to-human tissue transplanting.

**Context for Firm Strategy & Rivalry**

**Niche markets:** Created as the pork production industry continues to mature and find additional markets. Markets may require leaner or fatter pigs, allowing producers to either “diversify” or “specialize” their production process. Another example of a growing consumer market is for more “naturally” grown or “organic” food sources. This may present a strategic competitive advantage to our region, due to the quality of the soil and its ability to work with natural (manure) fertilizer.

**Breeding Programs:** With the development and growth of breeding and genetics programs, pork producers can utilize the techniques to further distinguish their production processes on a global, regional or local strategy level. The choices made by producers will directly impact the alignment of potential rivals within selected markets.

**High Quality at Low Cost:** Like all industries, pork producers strive to improve the quality of their product while simultaneously striving to lower their costs. Continuous improvement and research increase sustainability. Those producers who are not low cost, high quality, environmental friendly will not survive. Hog producers are feeling more pressure to meet the increasing consumer demands for high quality, wholesome pork products. The global market and Japan in particular require high standards and certifications.

**Fertilizer/Manure Processing:** Methods of fertilizing crops for pork production feed continue to evolve. Overall, the industry continues to look for more natural ways to increase crop production without depleting the natural resources of the soil. Hog manure has grown in popularity as an alternative fertilizer for crop production. This provides a new revenue stream for pork producers and enhances the profitability of pork production operations, offering a new strategy for viable sustainability.

Gyles Randall of the U of M Southern Experiment Station at Waseca, says some hog operations produce more manure than their land can environmentally accept and often seek arrangements with neighboring farms to apply manure to their land. The neighbors often question the value of the manure compared with fertilizer nitrogen. Randall conducted seven field studies in five southern Minnesota counties over the past 11 years in which he compared hog manure to fertilizer nitrogen. Corn yields were greater for hog manure than for commercial fertilizer at six of the seven sites, says Randall. At the six sites where the manure was applied, corn yielded 10.7 bushels per acre more with spring-applied manure than with the nitrogen fertilizer rate. Randall says the overall study results clearly show a yield-enhancing effect from hog manure compared with fertilizer nitrogen.1

**Bio-Medical/Alternative Fuel:** The bio-medical application of hog tissue is an emerging industry strategy. Scientists have learned that many of the functions of hog organs and tissue resemble that of humans. From heart values to treating diabetes to skin graphs, bio-medical applications may produce a substantial new opportunity for pork producers. Hog waste is also being considered as a potential source

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of alternative fuel. Animal waste produces methane gas. This type of gas is being developed into a potential viable alternative to natural gas used for heating. This new use, along with competition for hog waste as fertilizer, may create a higher demand and market price for manure. This provides for additional strategy opportunities for the industry.

**Corporate & Global Competition:** Pork is the most widely eaten meat in the world. The European Union is the number 1 hog exporter. The United States is number 2. Developing countries want more meat. As they have more money, they purchase more meat. China consumes 52% of the world’s pork production. They produce 53% of the world’s pork. Chili exports 60% of the pork it raises. Ham is exported to Mexico. The United States is gaining on Europe because Europe is putting more restrictions on how the pork is raised and their prices are rising. In order for agriculture to stay competitive in the world, agriculture must be more industrialized. Many producers do not consider other pork producers as competitors, but as fellow producers providing food. Often these producers consider “beef” as their biggest competitor in the market!

**Environmental Friendly Initiatives:** The pork producers in the region take a very proactive approach to dealing with environmental issues. Producers stated that they view their relationship with EPA regulators as a partnership in quality control and land management. Many participate in environmental friendly initiatives as a strategy for corporate citizenship and to promote it universally within the industry to maintain supportive rivalry.

**Continuous Improvement & Innovation:** People in the United States spend on average only 12 minutes preparing meals. They want food even faster. Pork for the microwave is being developed. Christensen Farms has a research team that is looking at the following: better ways to feed pigs that reduce odors and by products, feed faster, and generate leaner pork. Beyond research innovations, the development of human capital is also a critical innovation need. Programs have been created to encourage youth to go into agriculture. Some producers work with the University of Minnesota on leadership development programs, help family businesses plan for transferring the business to subsequent generations and provide continuing education on family business development. The failure rate for 2nd and 3rd generation family businesses is 85%. Creative approaches are needed to work with families to plan for the future. In the next 25 years, the pork producers we talked to expect to see more niche markets such as antibiotic free, being developed to fit segmented markets in the market place. There will likely be fewer independent producers. There will be more “integrated” producers who will have identified the variables that contribute most to low cost and efficiency and will bring them in-house.

**Partnerships & Cooperative Agreements:** The evolving partnerships and cooperative agreements that exist within the industry cluster is a sign of a mature cluster. Many of the organizational structures of the industry reflect horizontal integration of management and ownership. An example of this facet of the industry is land being “given” to a crop producer in return for exclusive rights to purchasing corn and the corn grower having exclusive rights to the manure from the pork producer. Multi-faceted relationships are very common in this region, reflecting joint strategic planning and execution of business plans.

**Demand Conditions**

**Commodity Markets:** The demand for pork in the commodities market is tied to local processors, global processors and medical application. There are three major local processors that are supplied by the region’s producers: Hormel, Swift and Tyson (IBP). These three companies represent the bulk of pork processing in the region. The global processor market is also expanding. Approximately 1/6 of all pork produced in the region is shipped out of the country. Medical application is the third component of the commodity market. Heart values, skin graphs and insulin from hogs are examples of medical applications for humans. It is listed as a commodity market issue because of the large number of tissue samples required to determine proper matches to human tissue. As the industry advances, medical applications may become more of a product market for pork producers.
**Product Markets:** The product markets for pork production include local consumers and global consumers. This primarily relates back to leveraging niche markets discussed earlier. Some pork producers provide local “boutique butcher shop” services, catering to local distinguishing tastes for particular cuts of meat. This same practice has global application, as various niche markets have developed around the world based on cultural tastes and values.

Consumers demand safe, affordable, high quality meat. The market sees pork as an important source of protein. The US market prefers a leaner product that is safe, affordable and high quality. Japanese prefer more marbled fat on their pork. Strategy is feeding the masses, not specific niches. The export market for pork continues to grow. Much of the pork processed at Triumph Foods caters to the high end Japanese market. The manure industry is growing and profitable due to the cost of commercial fertilizers.

**Related & Supporting Industries**

**Trucking:** As discussed earlier, the trucking industry is critical to the integration of the pork production cluster. Recently, a non-partisan group has been formed, called the I-90 Corridor Group. Along with other issues, this group was formed to address the need for highway maintenance related to agri-business activities, including pork production. The goal is to support the upgrading of all major roadways to meet the standards needed by this industry.

**Feed Milling:** If you have to transport feed, it is difficult to be competitive. Some hog producers operate their own feed mill and manure management systems, storing grain on their land that they feed to their hogs. 60% of raising hogs is the cost feed

**Ag Equipment & Supplies:** Feed/hogs cannot be produced without the right kind of equipment and supplies. The area is home to a number of ag equipment distributors, most notably John Deere.

**Bio-Medical:** Still in its relative infancy, the bio-medical device industry could potentially become a major related and supporting industry. As research continues to develop applications for hog tissue for organ and other types of transplants, this could increase the demand and prices for hog breeding. It is too early to tell just how significant this will become.

**Grain Farmers:** Corn and soybean acres serve a dual purpose to the success of Minnesota hog production. First, the crops provide an excellent, locally grown feed for hogs, and secondly, the acres where corn and soybeans grow must be replenished with nutrients that are naturally found in swine manure. Each hog consumes 3.8 bushels of soybeans in its lifetime. The soybeans are consumed as soybean meal, which is an ideal feed for swine because of its high protein content. The average pig will also consume 10.5 bushels of corn in its lifetime. In 2005, Minnesota hogs ate 158 million bushels of corn and 57 million bushels of soybeans.

**Trade Associations:** The primary trade organization is the Minnesota Pork Producers Association. They serve a primary role of promoting the industry, supporting legislative issues, serving as a liaison with regional and national issues, and providing public and consumer education and information. Other associations that support this cluster include: Corn Growers Association, Minnesota Dairy Association. Minnesota Agri-Growth Council, the Minnesota Chamber of Commerce, the National Pork Producers Council, National Pork Board, Minnesota Grown (promotes “buy local” to consumers as well as educating consumers on the safety of local farm grown products) and the Land Stewardship Project.

**Alternative Energy:** The use of manure as an alternative energy source has the potential to have both positive and negative impact. On the positive side is the development of methane gas as a renewable energy source to replace natural gas for heating. This would provide another value-added opportunity for managing animal waste, along with its use for fertilizer. The potential negative development would be the use of corn for ethanol. If ethanol continues to grow in popularity, it could begin to seriously compete with corn production for feed. With ethanol highly subsidized and pork production not subsidized at all, this may create some concerns of fair competition for an input resource that would not favor pork production. Pork producers may have to shift more resources into corn production to control feed supply. This is
critical, as 60% of the cost of pork producers is feed. A possible solution is the increased use of soybeans as a food source.

**Veterinary Services:** A key component of the health and quality of the hogs in pork production is veterinary services. According to the Minnesota Pork Producers Association, there are approximately six veterinary practices that account for about 90% of the services provided to pork producers. This is typical of well developed clusters, providing highly specialized services from support industries.

**Chance**

**Weather:** The single most important factor for chance within the pork production industry is weather. Severe changes in weather can affect crops that supply feed and other conditions can have a direct impact on livestock. For the pork producing industry, weather elements have been reduced, due to the changes in the housing of hogs. For the most part, hogs spend the majority of their time inside and are not exposed to harsh weather conditions.

**The Role of Government**

**Regulatory Issues:** The hog production industry in Minnesota primarily interacts with government on regulatory issues. These issues primarily relate to environmental concerns over feedlots and animal waste. The Environmental Protection Agency provides minimum standards for design, construction, operation, closure and discharge processes. The primary focus of these standards relate to distances from individual and community wells; and waterways. These standards can be further modified by state, county and township governments. Each of the regulations governing hog production varies, based on the size of the operation. The following table illustrates this concept.

<table>
<thead>
<tr>
<th>Lot Size</th>
<th>Federal</th>
<th>State</th>
<th>County</th>
<th>Township</th>
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<tbody>
<tr>
<td>10-49</td>
<td>Standards</td>
<td>Monitor</td>
<td>Zoning</td>
<td></td>
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<tr>
<td>50-299</td>
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<td></td>
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<td>300-499</td>
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<tr>
<td>500-999</td>
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<td>1,000+</td>
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South Central Minnesota has a fairly positive relationship with regulatory agencies. It is the only region in the state that has 100% of its feedlot inventories fulfilling registration requirements. Hog producers in Minnesota work very closely with county and township governments. The majority of issues relates to zoning, as hog production continues to grow and must be balanced with the demands for city and rural housing development. Some counties are more welcoming to the potential growth of the hog production industry and have zoning laws that favor this type of development. Others seek to contain hog production at current levels and creating zoning restrictions that make it nearly impossible for hog farms to grow any larger.

Unlike other sectors of agricultural and agricultural related products, the hog production industry is not subsidized by any governmental agency. There may be future concern about renewable energy subsidizes changing the pricing structure and demand for corn. With feed comprising 60% of the cost of hog production, this will be carefully watched by the industry.

Companies like Ag Star who provide financial services to the cluster are regulated by the Farm Credit Administration. These regulations limit AG STAR to providing services only in the United States. They also have some involvement with the Farm and Home Administration which provides federal guarantees on some farm financing programs.
**Food Quality:** Issues with food quality have greatly diminished over the past 10-15 years, as genetics and animal management practices have improved. Pork, once seen as a gateway for parasitical diseases being passed on to humans, remains relatively disease free and new cooking standards allow for a variety of ways to prepare the meat.

**Safety Issues:** Some of the producers indicated that government can play a role in educating consumers on the safety of buying direct from a producer. That would include educating consumers on what to look for when buying from a farm/producer. The USDA inspection bug or state inspection bug should be on every package of meat they purchase. State and local inspections of farm facilities are part of the permit process. Food safety is a big issue with consumers and will continue to be an issue as more food safety scares show up in the papers.

**Legislative Policies and Issues:** Unlike other sectors of agricultural and agricultural related products, the hog production industry is not subsidized by any governmental agency and has never received government supports that are common for corn, soybeans, wheat and dairy. There may be future concern about renewable energy subsidizes changing the pricing structure and demand for corn. With feed comprising 60% of the cost of hog production, this will be carefully watched by the industry. It is important that all food producers be informed about the legislative process and the impact our lawmakers have on our farms. It's important that they are engaged in the process so laws are determined based on sound science and not emotion. Import/export policies are instrumental with the growing global market for pork.
According to the Minnesota Pork Producers there are the key infrastructure issues that drive swine production:

- Having Feed and Feed Milling available. Providing it directly as Christensen farms does, or having it available in the local community (Hubbard, Lake Crystal Cooperative)
- Having access to Veterinary Clinics that specialize in Swine Health for direct veterinary services and feed ingredient supplies. Six clinics in Southern MN influence about 90% of pigs produced. Producers need access to Feed.
- Having Consulting and Management Companies available to provide specialized management services, information and knowledge skills, or human capital to manage operations.
- Having access to appropriate land. There are three steps to determine site locations for production: 1) Set back distance requirements; 2) driving distance to feed of no more than 50 miles, and 3) available road system with no less than 10 ton weight restrictions.
- Having Processing Plants located within a reasonable distance.
- Having access to local farmers managing the feeder pigs
- Having access to infrastructure and utilities construction professionals and suppliers. There are only certain contractors that know how to prepare the buildings and only a few electricians who know how to properly wire a hog facility.
  - 60% of raising hogs is feed
  - 10% of raising hogs is facilities
  - 30% of raising hogs is labor, veterinary services, and miscellaneous—mostly labor
Value Chain/Value Activities

The most difficult part of this business is determining pricing. The pricing must cover the costs of producing, processing, and transporting the animal and other factors. It costs more to have a pig butchered for direct marketing. Different pricing systems are often needed for different customers; one price for wholesale food cooperatives who buy in bulk, one for direct customers who buy by the bundle, and one for direct customers who buy in small quantities.

**Pork Production Value Chain**

<table>
<thead>
<tr>
<th>Narrow/Niche Market</th>
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<thead>
<tr>
<th><strong>Firm Infrastructure:</strong></th>
<th>Financing and Bookkeeping from Farm Credit Provider</th>
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</thead>
<tbody>
<tr>
<td><strong>Human Resource Management:</strong></td>
<td>Family Owned and Operated</td>
</tr>
<tr>
<td><strong>Technology Development:</strong></td>
<td>Continuous Improvement of Tastier Hog and Continuous Search for Meat Products that Fit Niche Customer</td>
</tr>
<tr>
<td><strong>Procurements:</strong></td>
<td>Natural Feed Grown with Sustainable Farm Practices</td>
</tr>
</tbody>
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<table>
<thead>
<tr>
<th>Inbound Logistics</th>
<th>Operations</th>
<th>Outbound Logistics</th>
<th>Marketing and Sales</th>
<th>After –Sales Service</th>
</tr>
</thead>
<tbody>
<tr>
<td>-Self-Contained Farrow To Finish</td>
<td>-Local Meat Processing</td>
<td>-Obtain Orders Through Phone, Internet, and in Person</td>
<td>-Ship Products directly to customer</td>
<td>-Good Customer Service and follow-up.</td>
</tr>
<tr>
<td>-Raise Berkshire Breed Hogs</td>
<td>-Produce and Sell Related Products</td>
<td></td>
<td>-Pricing for bulk, bundle, or small quantity purchase</td>
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<tr>
<td>-Hogs Raised Naturally</td>
<td>-Use Special Packaging</td>
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<td>-Cater barbeque pork at events.</td>
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<tr>
<td>-Grow their own feed</td>
<td>-Prepare Custom Choice Cuts and Specialty Meat Products</td>
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<td></td>
<td></td>
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<tr>
<td></td>
<td>-No additives</td>
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PROFIT

MARGIN
# Pork Production Value Chain
## Broad/Global Market

<table>
<thead>
<tr>
<th><strong>Firm Infrastructure:</strong></th>
<th>Family owned business, expanded through contracting with area farmers and acquisitions; operates own feed mills, manure management plants, and meat processing plant for foreign market.</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Human Resource Management:</strong></td>
<td>Labor Initiatives; Extensive Training Materials/Work Skills; agronomy &amp; veterinary staff</td>
</tr>
<tr>
<td><strong>Technology Development:</strong></td>
<td>Research &amp; Development in Breeding, Feed &amp; Agronomic Programs</td>
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</table>

## Procurement:

<table>
<thead>
<tr>
<th><strong>Inbound Logistics</strong></th>
<th><strong>Operations</strong></th>
<th><strong>Outbound Logistics</strong></th>
<th><strong>Marketing &amp; Sales</strong></th>
<th><strong>After-Sales Service</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>-Breed hogs to meet demands; i.e., leaner hog for US market, fatter hog for Japan market.</td>
<td>-Contracts raising of hogs</td>
<td>-Own fleet of trucks</td>
<td>-Marketing through State &amp; National Pork Associations</td>
<td>-Good customer service follow-up</td>
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<tr>
<td></td>
<td>-Reuse/sell manure for fertilizer</td>
<td>-Located on major highways</td>
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</table>

**Inbound Logistics**

**Operations**

**Outbound Logistics**

**Marketing & Sales**

**After-Sales Service**
Action Plan

Obviously this report only scratches the surface in evaluating the issues that affect this critical area cluster. The first step will be to present the results to our local WorkForce Development Committee and to the South Central WorkForce Council. The WorkForce Development Committee includes area economic development professionals, WorkForce Council Board members as well as Employment and Training Professionals. This presentation and discussion with these groups will determine what areas of the report may merit further study.

Simultaneous to this presentation, we will be distributing this report to those who contributed to its development.

Partners will meet and discuss key findings, but more important, how the skills gained as a result of this training can be applied to other industry clusters.

As indicated previously, partnership with post-secondary schools not only provides research in pork production, but the trained human resources needed. We will forward training needs/issues to post-secondary schools so they can continue to meet the needs of the industry.

Pig manure may become a source for bio fuel development, and may represent an emerging opportunity. It could also present a threat to the hog industry cluster if it becomes large enough to compete for food resources. We are recommending this area for further study.