Temporal Implications of the Dairy Industry on the Texas High Plains

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Introduction

The dairy industry in the Texas High Plains has expanded rapidly in the past fifteen years. As the number of dairies and overall farm size has increased more inputs like feed and water are needed to support the increased number of cows. The region is home to a thriving agriculture industry largely due to the presence of the Ogallala Aquifer (Figure 1). The aquifer allows crops to be grown in the semi-arid region by providing the groundwater necessary for irrigation. The ability to irrigate crops is especially important to dairies since a typical dairy cow ration relies heavily on silage (Table 1). Silage has a high moisture content, making it difficult and expensive to import into the region. Therefore, silage must be grown in close proximity to where it will be consumed (Guerrero et al., 2012).

Data & Methods

Study Period:
- Pre-Expansion: 1975-1999
- Post Expansion: 2016-2046

- Dairy cow inventory and crop acreages data were gathered from the USDA’s NASS database, along with County Business Patterns data. Dairy cow inventory projections from Texas Senate Bill 4 will be used to evaluate future expansion implications.
- For this poster, the Dallam/Hartley County region of Texas was selected to examine some of the local impacts the dairy industry expansion has created.
- A regression analysis will be completed to examine the strength of the predictive relationship between dairy inventory and changes in business composition. A spatial regression analysis will also be conducted in order to study how the location of the dairies effects various areas of the study region.
- Furthermore, a sensitivity analysis will be performed to see how varying levels of expansion rates may impact these variables 10, 20, and 30 years in the future.

Dairy Rations

<table>
<thead>
<tr>
<th>Dairy Rations</th>
<th>As Fed (lbs)</th>
<th>% of Total Ration</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total Forage</td>
<td>81.8</td>
<td>76%</td>
</tr>
<tr>
<td>Alfalfa</td>
<td>8.4</td>
<td>8%</td>
</tr>
<tr>
<td>Total Silage</td>
<td>73.3</td>
<td>68%</td>
</tr>
<tr>
<td>Corn Silage</td>
<td>49.1</td>
<td>46%</td>
</tr>
<tr>
<td>Sorghum Silage</td>
<td>8.2</td>
<td>8%</td>
</tr>
<tr>
<td>Small Grains Silage</td>
<td>10.1</td>
<td>9%</td>
</tr>
<tr>
<td>Concentrate</td>
<td>15.9</td>
<td>15%</td>
</tr>
<tr>
<td>Cotton Seed</td>
<td>4.9</td>
<td>5%</td>
</tr>
<tr>
<td>Protein</td>
<td>1.8</td>
<td>2%</td>
</tr>
<tr>
<td>Minerals</td>
<td>1.0</td>
<td>1%</td>
</tr>
<tr>
<td>Total</td>
<td>107.4</td>
<td>1</td>
</tr>
</tbody>
</table>

Table 1. Dairy Cow Rations

Factors influencing the establishment of dairies in the study region:
- Availability of land
- Affordability of inputs
- Lower population density
- Less stringent environmental regulations
- Supporting satellite industries

The contributions of the dairy industry and the effects they have on rural communities should be considered in addition to the economic, generating over $1.3 billion from the years 2011-2012. As Fed (lbs) % of Total Ration

Discussion

Hilmar Cheese Company established a plant in the Dallam/Hartley County region in 2005. Employing only 120 people initially, it underwent several expansions in the next decade. It currently employs over 400 workers and has doubled capacity from when it was initially established. This growth reflects the trend seen across the entire study region. Various industry sectors showed an increase in employment during this time period. The construction, transportation, and wholesale trade sectors displayed the most growth (Figure 3), suggesting that the dairies’ effects are more wide reaching than just the expected agriculture or manufacturing sectors. Possible explanations include that as population has increased, more fluid milk and milk products require transportation.

Dairy Ration

Hilmar locating in the Dallam/Hartley County region of Texas created a high demand for fluid milk. In response, dairy cow inventories skyrocketed from fewer than 300 cows in 2000 to almost 40,000 head in 2015 (Figure 5).

References


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Legend:
- 10 Construction
- 21 Manufacturing
- 30 Wholesale Trade
- 40 Retail Trade
- 50 Transportation and Warehousing
- 60 Information
- 70 Finance and Insurance
- 80 Real Estate and Leasing
- 90 Professional, scientific, and technical services
- 91 Health Care
- 92 Education
- 93 Social Assistance
- 94 Community, clubs, and religious organizations
- 95 Other services

Figure 4. Changes in Employment in Dallam/Hartley Counties

Figure 5. Population and Dairy Cow Inventory in the Dallam/Hartley Region, 2000 and 2015