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COMPLEX EFFECTS OF VALUE-ADDED LIVESTOCK VENTURES

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Value-added agriculture ventures are generally touted as being positive for a region's economy. A product formerly shipped elsewhere may now be processed or modified locally or regionally, providing additional employment and related economic activity. Ethanol production, for example, disrupts the pattern of sending corn out of a region, but usually occurs where corn production is already prevalent.

Consider, instead, the implications of a new livestock production facility. In this article, observations are made at the state and county levels related to livestock ventures. Kingsbury County is examined for potential effects on the production agriculture (or farming) sector. A livestock venture likely has more complex effects on a region than a processing venture, especially when considering differences between rural and urban employment patterns.

A new livestock facility would be expected to cause multiple changes along the production supply chain. First, different feeds may be produced and consumed close to the livestock production area. For example, a new dairy may require alfalfa hay, corn silage, and a protein source where previously corn for grain had been grown. Second, additional animals increase manure production that can be used to augment or replace commercially produced fertilizer. For example, a new swine finishing unit may need

cropland acres for manure application. Third, depending on the livestock enterprise, there may be spillover ventures such as breeding or growing facilities on nearby farms.

Livestock ventures share a common feature; they are more likely to involve changes on other farms in the area compared to other ventures. The presence of agriculture ventures in rural areas generally involves a different mix of business and employment patterns than do other ventures. Thus, a newly located, or an expanding, livestock venture may cause changes in existing business relationships. The economic changes taking place in the region likely affect farm- and non-farm related businesses.

Input Differences

Potential effects of livestock development can be observed at the state level based on the relationship between livestock and inputs. For example, the presence of cattle in a county is associated with the production of corn for silage (Figure 1). The most recent comprehensive data on the livestock-silage relationship comes from 2012. While drought conditions in much of the state led to high levels of silage production for many counties that year, the presence of cattle also made this alternative harvest method feasible.

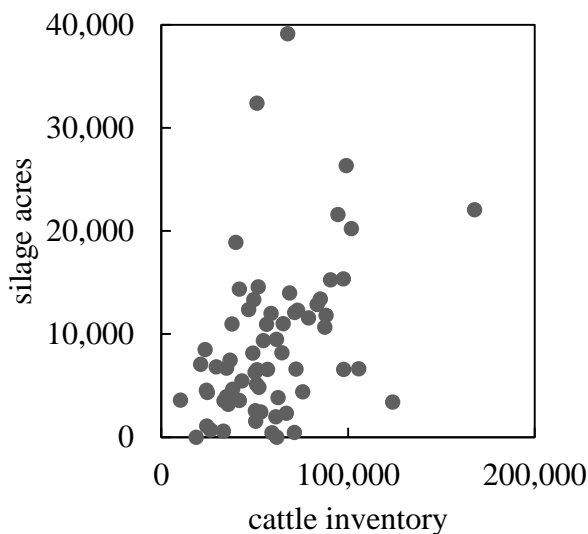
Another connection between livestock and inputs is through the nutrient value of manure. While it would be reasonable to expect a reduced level of commercial fertilizer sales in the presence of adequate manure, the additional animals may increase feed demand, so total fertilizer use may increase to achieve yield objectives.

Assuming that mainly confinement animals produce manure that may offset commercial fertilizer, it seemed feasible to build a balance sheet of nutrients across counties. A literature review frequently points to Kellogg et al. (2000), who calculated animal units

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at the county level, estimated the proportion of animals in confinement settings, reported the amount of manure produced by animal units, and estimated the amount of nitrogen and phosphorus present in the manure after losses. Fertilizer expenses were reported at the county level in the *2012 Census of Agriculture*, along with animal inventory levels. However, many counties with large livestock operations also had inventory numbers obfuscated to maintain privacy. Thus, it is not feasible to use Census data to draw conclusions at the aggregate level.

Figure 1. Relationship of cattle inventories and corn silage acres, South Dakota counties, 2012



Source: *2012 Census of Agriculture*.

Employment differs by farm enterprise level based on a classification of farms by the North American Industry Classification System (NAICS). The *2012 Census of Agriculture* provides a breakdown of farms by NAICS category at the state level. Consider the percent of farms that had hired labor. Across all 31,989 farms in South Dakota in 2012, 9,938 (or 31.1%) had hired labor and their corresponding production expenses averaged \$26,902 per farm. The average expense per farm should not be confused with a wage rate or salary level, as it reflects different numbers of full- and part-time employees across farms. The percent of farms with hired labor and the average expense per farm by NAICS category are shown in Table 1.

Table 1. Labor Characteristics of South Dakota Farms by NAICS Category, 2012

NAICS Category	Percent of Farms with Hired Labor	Labor Expense \$ per Farm
Oilseed and grain	42.3	27,563
Vegetable and melon	40.6	14,714
Fruit and tree nut	42.2	21,333
Greenhouse and nursery	60.0	68,646
Other crop	16.9	7,927
Beef cattle	32.2	15,151
Beef feedlot	47.7	54,273
Dairy and milk	50.7	237,429
Hog and pig	45.3	156,158
Poultry and egg	15.6	107,132
Sheep and goat	20.0	5,336
Other animal	17.2	28,484

Source: *2012 Census of Agriculture*.

Some of the specialized livestock farming types are more likely to have hired labor and greater expense levels on a per farm basis than the average farm (Table 1). Over half of the dairy farms, for example, had hired labor. Dairy, hog and poultry farms with hired labor had relatively high labor expense levels per farm. All three types of farms averaged over \$100,000 per farm in labor expenses.

Spillover Effects on Farms

Table 2 reports various statistics for Kingsbury County in comparison to South Dakota. The estimated population for 2012 from the U.S. Census Bureau was 834,504 statewide, but it was only 5,240 in Kingsbury County or less than one percent of the state population. In contrast, in Kingsbury County there were 518 farm operations, or 1.6 percent of the total number of farms in South Dakota.

Many farmers in Kingsbury County also worked off the farm. Among principal operators, 332 gave farming as their primary occupation. Off-farm work was common, reported as 200 days or more by 177 operators and as less than 200 days by another 81 operators, leaving 260 operators with no days worked off-the-farm. Some of those without off-farm work may be retired.

Table 2. Business and Labor Statistics, South Dakota and Kingsbury County, 2012

	<i>South Dakota</i>	<i>Kingsbury County</i>
Population ^a	834,504	5,240
Farms ^b	31,989	518
Employees ^c	570,872	3,173
Wage/Salary	435,383	2,110
Proprietors	135,489	1,063
Farm	27,513	441
Nonfarm	107,976	622
Farm Labor ^d	34,385	584
Businesses ^e	25,773	171

Notes: ^aJuly 1 estimate from the U.S. Census Bureau. ^bSource: 2012 Census of Agriculture. ^cSource: U.S. Bureau of Economic Analysis. ^dSubtotal of all employees. ^eNumber of establishments from the U.S. Census Bureau.

Even though there were only 518 farms, there were 748 total operators (often spouses or other family members). Hired labor was reported on 185 farms in Kingsbury County, with a total of 512 workers across farms, and with 212 individuals working 150 days or more in the year. The total payroll from farm labor for the County was \$5,081,000. About half of the farms had only one hired person.

A slightly different picture develops when using data from the U.S. Bureau of Economic Analysis (BEA). The BEA reports there were 3,173 (full- and part-time) jobs in Kingsbury County in 2012 (Table 2). Of those, 2,110 were wage or salary employees and 1,063 were proprietors. Thus, one-third of the jobs in Kingsbury County did not involve working for someone else. The proportion of proprietors to total employees is substantially higher in Kingsbury County than for the state as a whole. Furthermore, the proportion of farm proprietors to all proprietors is relatively high in Kingsbury County.

The agriculture sector dominates Kingsbury County, as measured by the total number of employees. The BEA reported 441 farm proprietors and 584 farm employees in Kingsbury County in 2012 (Table 2). The discrepancy from Census data is likely based on reporting and measurement differences. Regardless of the data source used, the farm sector is the

dominant industry for employment in Kingsbury County (Table 3). Manufacturing was the next largest industry with 369 employees, followed by government with 340 employees. Undoubtedly, many of the other businesses support the farming or production agriculture sector in Kingsbury County.

Table 3. Employment by NAICS Industry, Kingsbury County, South Dakota, 2012

<i>Industry</i>	<i>Number of Jobs</i>
Farm Employment	584
Manufacturing	369
Government	340
Construction	282
Health	268
Retail	257
Wholesale	195
Other Services	158
Transportation	96
Other Combined Industries	624
Total	3,173

Source: U.S. Bureau of Economic Analysis

Any venture involving additional employment and population likely has effects observable in sales tax receipts. Specific to Kingsbury County, the major Standard Industrial Classification (SIC) groups (data are not available by NAICS) highlight the type of spending that happens within the county. Specific to 2012, the largest SIC group for taxable sales was food stores (Table 4).

Table 4. Taxable Sales by Top-Ten SIC Group in Kingsbury, County, South Dakota, 2012

<i>Major Group</i>	<i>Taxable Sales (\$)</i>
Food Stores	9,684,433
Misc. Retail	6,668,185
Building Materials	5,134,611
Electric Services	5,113,426
Eating Places	3,854,079
Wholesale Trade	3,133,496
Business Services	1,907,654
Auto Repair	1,854,483
Personal Services	1,101,304
Agricultural Services	1,081,960

Source: SD Dept. of Revenue and Regulation

Retail, building, utilities, and restaurants complete the top five categories. All of these sectors are tied to local personal spending, so growth in any new venture would also benefit these groups.

Summary

New ventures are likely to have positive effects on a region’s economy. A new livestock venture will likely have spillover effects on the demand for inputs, and affect the crop mix, fertilizer displacement from manure production, and employment levels in a region. Rural areas may have a disproportionate number of farms, farm employees, and farm-related businesses. Thus, looking for and counting “jobs” may not necessarily capture the distinction that may occur from new livestock ventures. A new livestock venture that locates in an area, or an existing livestock that expands, may lead to additional farm-level employment. However, in rural counties, there may be an expansion of proprietorships instead of just more wage and salary employment.

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